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Introduction.

THE letters comprised in the following collection were written from Bulgaria by Mr. J. A. MacGahan, the gentleman who visited that province on behalf of the *Daily News* in July and August last, and made a special inquiry into the atrocities alleged to have been committed there by agents of the Turkish Government. As they have already been not only published in the *Daily News*, but re-published more extensively than any letters ever were before by the daily and weekly press; as they have stirred the public mind to its depths, and as, further, they, together with the letters of the Constantinople correspondent of the *Daily News*, have been acknowledged by the Government, not only to have made it aware of important facts of which, until their publication, it was ignorant, but to have changed the conditions under which its diplomacy must henceforth be exercised, it will not be necessary to describe in this place their character or contents. Now, however, that, to meet a want that has been expressed, these are brought together and re-published as a whole, it may be useful to give a very brief account of the circumstances under which the special inquiry was undertaken. Such a statement, which may not be without its use to the future historian of the press, will also serve to correct some current misapprehensions.

The Bulgarian atrocities are no longer spoken of as a "lucky find" on the part of the conductors of the *Daily News*, but the praise of "extraordinary enterprise," which, when fairly awarded, they do not decline, has been occasionally conceded to them in terms which ignore the peculiar relation in which they stood to the facts transmitted from Bulgaria in the month of June, and of which enough was known to awaken painful misgivings on the part of the British public. If a simple recital should show that it was a Correspondent of the *Daily News* who, in the ordinary discharge of his duties at Constantinople, and without leaving his post, but by giving due heed to the information which came within his reach, first made known the facts which, as subsequently verified on the spot, have electrified the country, then the visit of an independent inquirer to Bulgaria to investigate the grounds of the terrible allegations made against the Turkish Government will not seem that gratuitous undertaking which it has been some-times represented to be. The institution of such an inquiry was a task which the conductors of the *Daily News* had not contemplated; it was imposed upon them, as will be seen, by circumstances—especially by the default of official persons—which they could not have foreseen; but when once their duty was made clear, they did not hesitate for a moment to accept it.

It was on the 23rd of June, barely six weeks before the publication of its Special Commissioner's telegrams from Tatar Bazardjik, which startled England like a peal of thunder, that the *Daily News* published a letter from its Own Correspondent resident at Constantinople, of which the following are the opening sentences:—

"Dark rumours have been whispered about Constantinople during the last month of horrible atrocities committed in Bulgaria. The local newspapers have given mysterious hints about correspondence from the interior which they have been obliged to suppress. I have hitherto refrained from mentioning these rumours, or from stating what I have heard, but they are now gradually assuming definiteness and consistency, and cruelties are being revealed which place those committed in Herzegovina and Bosnia altogether in the background."

In the same letter the names were given of thirty-four villages that had been destroyed, of a party of Bulgarian girls burnt, and of a hundred more killed in a village school. During the next fortnight other letters of the same Corre- spondent were published, amplifying details of the atrocities and extending their area. In the same correspondence were incorporated several columns of letters from towns and villages in Bulgaria, describing murders and the vilest outrages with a most impressive distinctness.

It may be affirmed without hesitation that no letters dealing with facts of a painful character were ever published which bore such evident marks of the scrupulous care of their author, and his anxiety in deciding between vague reports and ascertained facts. But while these letters arrested the attention of the public, and excited a desire for fuller information, in official quarters they met with a far different reception. That the statements contained in them should be encountered with a certain degree of scepticism is a fact creditable to humanity, and if it had been objected to them that they were such as could not be received without corroboration, there would have been nothing to complain of. But counter-statements were made professing to be based upon more accurate knowledge. The Turkish Government met the case boldly, and by its foreign ministers denounced the Constantinople correspondence of the *Daily News* as monstrous exaggerations. The English Government, which ought to have been in possession of authentic information from Constantinople, could only say that the reports of the *Daily News* were without official confirmation, while by a certain portion of the press the disclosures of Turkish atrocities were described as sensational and unworthy of notice.

It was in these circumstances that a further and wholly independent inquiry into the events in Bulgaria was

deemed necessary, if the light which had been kindled by the Correspondent of the *Daily News* at Constantinople was not to be suffered to be extinguished. The special inquiry conducted by Mr. MacGahan, and of which the following letters are the result, was rendered necessary by the evident want of information on the part of the English Government. The first time that Sir Henry Elliot mentioned the atrocities in Bulgaria in his correspondence with the Foreign Office, appears to have been on the 19th of June, three days after the letter of the Constantinople Correspondent above quoted, and in it he speaks of "the cruelties with which the suppression of the Bulgarian insurrection has been accompanied," and he adds, with reference to Consul Reade's report, "the accounts from other sources are still more distressing." For weeks the Turkish capital had been full of reports of these occurrences, and it seems extraordinary that an Ambassador, residing within twenty-four hours' journey of Bulgaria, should have taken no pains to inform himself respecting them.

Mr. MacGahan reached Philippopolis, the centre of the district in which the atrocities were perpetrated, on the 23d of July, and at once commenced his inquiries, in company with Mr. Eugene Schuyler, American Consul-General for Turkey. It will appear sufficiently, in the course of the following letters, how much the Special Commissioner of the *Daily News* was indebted to Mr. Schuyler for assistance in the course of his inquiry under circumstances the difficulty of which must be obvious. The inquiry was independent. It owed nothing either to the British Embassy at Constantinople or to the Turkish Government. That evident independence opened to the Commission sources of information which would have remained closed to persons suspected by the injured population. The people came forward, and showed the sad evidence of their wrongs, but they were not the only witnesses. Foreign consuls, Greek residents, Germans in the employ of the Turkish Government, and Americans occupied in the work of education in Bulgaria, besides Turks themselves, testified freely, and to one and the same effect. The result is before the world. It has been said by the principal organ of Ministerialist Conservatism, that the "enterprise of searching out and dwelling upon atrocities has itself become an atrocity of a most disgusting kind."

Standard, Aug. 31, 1876.

But Ministers themselves have not endorsed the opinion. On the 11th of August, Mr. Bourke, Under-Secretary of State for Foreign Affairs, said in the House of Commons—"He felt bound to admit that the Government really had no idea of the events which had been going on in Bulgaria, until attention was called to them in the House, and he gladly took that opportunity of saying that the Government and the country were very much indebted to the newspaper correspondents through whom these events had become known." The public has abundantly confirmed the judgment of Mr. Bourke on these letters; and it now only remains for the conductors of the *Daily News* to acknowledge, as they do with the utmost pleasure, the great service rendered by their Constantinople Correspondent as well as the courage and perseverance of Mr. MacGahan in the prosecution of his arduous task; and to express the hope that the publication of these letters may hasten the redemption of the Christian races of South-eastern Europe from the degrading tyranny by which they have so long been oppressed.

September 6, 1876.

The Bulgarian Atrocities: "Daily News" Special Inquiry.

PHILIPPOPOLIS, *July* 28.

I ARRIVED here three days ago on a mission of investigation. Philippopolis, it may be mentioned, is the principal town in that part of Bulgaria which was the scene of the exploits of the Bashi-Bazouks, and is therefore the best or rather the only point at which trustworthy information can be obtained respecting the atrocities now exciting so much indignation in Europe. I found that Mr. Baring had already arrived and commenced the work of investigation. Mr. Schuyler, the American Consul General, likewise arrived, partly on a similar errand, partly to inquire into the advisability of establishing a vice-consulate, or taking other measures for the protection of a few American missionary families established throughout the country. The other consuls, I find, made reports to their respective Governments some time ago, and are now engaged in collecting further information relating to the insurrection.

It is a curious fact that while the Austrian, Greek, Russian and French Governments all have consuls in this place, who give minute and detailed reports of everything that happens here, the English Government, which one would think equally interested in receiving prompt and correct information, should have no agent at all.

There is an English consul at Adrianople, a very worthy gentleman, but his health is so shattered that he is utterly unfit for service of any kind. It is therefore scarcely astonishing that the English Government should know less of what is passing in Turkey than other Governments, and far less than well-informed newspapers.

When Lord Derby made the statement in the House of Lords that the Government had received no information from the consuls at Scutari, Belgrade, and Galatz about the atrocities of the Bashi-Bazouks, was he indulging in fun at the expense of his noble auditors? If he had said that the Government had received no information from the consuls at St. Petersburg, Berlin, and Vienna respecting the Dublin riots, he would not have made a more irrelevant statement. As far as the difficulty of communication is concerned, and the time required for the transmission of a letter, Galatz and Belgrade are further away from Philippopolis and the scene of the atrocities attributed to the Bashi-Bazouks than Vienna or St. Petersburg are from Dublin. The consuls in Belgrade and Galatz know absolutely no more of what is passing here than do the consuls in Bordeaux or Lyons. It is therefore to be fairly presumed that until Mr. Baring was sent out, the Government had absolutely no means of obtaining news, except through the papers, and that they will have obtained no direct information until Mr. Baring shall have made his report.

As before stated, I also came with the mission of investigating and making a report. I think I came in a fair and impartial frame of mind. I had determined to see for myself wherever it was possible; to make inquiries, to weigh and compare statements, to carefully sift evidence and get at the plain unvarnished truth, and not allow my mind to be influenced by unsupported assertions on either side. I had looked at the question first from the Christian and then from the Turkish point of view. I had heard the violent assertions of the one party, and the soft-worded apologies of the other, with equal coolness and impartiality, and had especially made a large allowance for the "gross exaggerations of the Christians." I had, in truth, listened to both sides with such equal impartiality that I had grown somewhat sceptical, a state of mind, I take it, peculiarly adapted to the spirit of scientific inquiry. I had besides resolved to keep up this frame of mind to the end. It is generally easy enough to bear the ills of other people, and to be calm and judicial where others' woes are concerned. I am now obliged to confess that I had miscalculated the circumstances.

I have scarcely more than begun the investigation, and the frame of mind I had resolved to maintain at any hazard has already passed away. I fear I am no longer impartial, and I certainly am no longer cool. There are certain things that cannot be investigated in a judicial frame of mind. There are facts which when perceived send the blood through the veins with an angry rush, and cause the muscles to contract in sudden anger. There are things too horrible to allow anything like calm inquiry; things, the vileness of which the eye refuses to look upon, and which the mind refuses to contemplate. There are facts which repel and revolt; facts which, when you go about among them, fly in your face. Such is the nature of the facts I came to investigate. I have already investigated enough to feel convinced that, except from a purely statistical point of view, further investigation would be unnecessary. Mr. Baring and Mr. Schuyler will probably give us enough statistics, and I shall be ready to accept their figures. The atrocities admitted on all hands by those friendly to the Turks, and by the Turks themselves, are enough, and more than enough. I do not care to go on heaping up the mournful count. When you are met in the outset of your investigation with the admission that 60 or 70 villages have been burned, that some 15,000 people have been slaughtered, of whom a large part were women and children, you begin to feel that it is useless to go any further. When, in addition to this, you have the horrid details of the vilest outrages committed upon women; the hacking to pieces of helpless children and spitting them upon bayonets; and when you have these details repeated you by the hundred, not by Bulgarians, but by the different consuls at Philippopolis and the German officials on the railway, as well as Greeks, Armenians, priests, missionaries, and even Turks themselves, you begin to feel that any further investigation is superfluous.

Mr. Baring, I am informed, will report that in the districts about Philippopolis and Tatar Bazardjik alone there have been about fifty villages burnt, without counting those that have been only pillaged, and that nearly 15,000 people have been slaughtered. This is the lowest estimate, and it does not include the districts about Sofia and those north of the Balkan. The French and Russian Consuls and the railway officials give much higher figures, and would put the number of villages burned at over a hundred, and the killed at 25,000 to 40,000. There are people who put the number of killed at 100,000. For my own part, once the enormous number of 15,000 killed in four days is admitted, I do not care to inquire further. The French Consul and the German railway officials may be right or they may be wrong. Fifteen thousand is enough; for no mere increase in a statement of round numbers can add to the horror of the thing. It is only in the recital of the details accompanying the butchery that the mind can grasp and understand the fearful atrocity of the business. The Greek Consul, who is not friendly to the Bulgarians, tells me of 12,000 wretched women and children marched into Tatar Bazardjik, nearly all of whom suffered the vilest outrages. He tells me of Bulgarian fathers who killed their wives and children in order to put them out of reach of the ferocity of the Bashi-Bazouks. The German officials tell me of the bodies of men cut up and flung to the dogs in villages near their own railway stations; of little children of both sexes maltreated and brutalised until they died; of a priest, whose wife and

children were outraged and slaughtered before his eyes, and who was then put to death, after the most fearful torture, the details of which are too abominable to be re-told. I have the story of a young and beautiful girl, who having found means to obtain the rudiments of an education, opened a school in her native village, and tried to do something for the education of the poor people about her, who is now lying in prison here sick and brokenhearted, whose story is too sad for recital. The French Consul tells me of Bashi-Bazouks relating to circles of admiring listeners how they cut off the heads of little children, and how the dismembered trunks would leap and roll about like those of chickens; and I shut my ears and say, "This is enough; I do not want to hear any more; I do not care to investigate any further." It does not matter to me that a few more or less have been committed. You cannot increase or diminish the horror of the thing by mere statements of round numbers. I shall leave the statistics to Mr. Schuyler and Mr. Baring, and shall be quite willing to accept their estimates.

It has been said that these acts were committed by irregular troops, over whom the Government had no control, for whom the Turkish authorities were in no way responsible, and that the latter would, on the contrary, have been very glad to restrain them. Unfortunately, there are many facts connected with the business which show that this view of the case is altogether erroneous. Had the Government really been in earnest in making these protestations, it would have seized some of the principal leaders of the Bashi-Bazouks, some of those who had particularly distinguished themselves by their ferocity, and punished them summarily. Chefket Pacha, for instance, who burned the village of Bazardjik, and slaughtered nearly all of its inhabitants under more than usually revolting circumstances, should have been one of the first to feel the strong arm of the law. But having done all this, he has been promoted to a high position in the Palace of the Sultan at Constantinople. Again, there is the case of Achmet Aga, a captain of a company of Bashi-Bazouks, who likewise distinguished himself by his ferocity. He wished to burn Philippopolis, and was only withheld from doing so by the energetic action of the governor, who has since been removed, and who threatened to attack him with the regular troops. It was he who slaughtered 8,000 people at Batak, and burned 200 women and children alive in the school. He is a low ignorant brute, who can neither read nor write, and yet he has been promoted to the rank of Pacha, and with that exquisite mockery of European demands for justice, for which the Oriental is so distinguished, he has been named a member of the commission appointed to prosecute and punish the Bashi-Bazouks. The reason is clear and simple. These men carried out the wishes and intentions of the Government, if not the positive orders. They did their duty, and have been rewarded.

But it has been said that the Bulgarians set the example of committing atrocities, and even Lord Derby, upon the authority of Sir Henry Elliot, made the statement before the House that both sides had been equally guilty in this respect. It might be interesting to learn where Sir Henry Elliot obtained his information. As I have already explained, the English Government had no agent here capable of sending information until the arrival of Mr. Baring. He could not have obtained it from other Governments, for the reason that the various consuls here, with all of whom I have talked, never reported any atrocities on the part of the Bulgarians to their respective Governments. He could not have obtained it from the Turkish Government, for the reason that even the Turkish authorities here do not claim more than 500 Turks killed altogether, of whom the greater part, they admit, were killed in battle, with arms in their hands; and further, because while they claim some thirty women killed, they have not so far given Mr. Schuyler proof that a single woman or child was killed or outraged. Kiani Pacha told him that the Mudir of the village of Avrat-alan had been killed with his wife and daughter. Mr. Schuyler found, upon inquiry, that the wife of the Mudir was absent in a different part of the country when the fight occurred, and that the report of her death was therefore untrue; while as to the daughter, he learned that the Mudir never had a daughter. But supposing that proof may yet be forthcoming of thirty Turkish women killed—as they may have been in the street fighting—it is very evident that at the time Lord Derby spoke, he had no proof of such a fact, nor the slightest reason for the sweeping assertion that the Bulgarians had shown themselves equal in barbarity to the Turks. The only inference is that he made a perfectly reckless statement, in support of which he had not the slightest particle of evidence; and this at the moment when Mr. Disraeli was accusing well-informed newspapers, that had taken pains to obtain correct information, of giving credence to exaggerated and unfounded rumours.

It is said that the Bulgarians had no business to rise, that they made an insurrection which was put down with a strong hand, and that they must take the consequences. The best answer to this is the manifesto published by the new Government, after the deposition of the late Sultan, in which it was shown that the misrule and oppression of the late Government had passed the limit of endurance. The extortions and mismanagement of the Government had produced such a degree of misery among the peasantry, that without a change their existence was no longer possible. This, indeed, was the reason for the revolution at Constantinople. And yet Midhat Pacha and his associates are still hanging and imprisoning these poor people for doing what they have shown the Bulgarians were perfectly justified in doing, and for what they themselves have done—revolting against the Sultan. The truth is, that no other people in the world but these Bulgarians would stand for a day the exactions, extortions, oppression, and tyranny to which they have been subjected for centuries. If it were attempted to

introduce into England the system of taxation in use here, the people would rise as one man against the Government. Why, then, should we so blame these poor Bulgarians for doing that which we all would do under like circumstances; why sympathise with the strong against the weak, when the weak are so evidently in the right?

Mr. Baring went to Batak to-day, and has not yet returned. Mr. Schuyler goes to-morrow, and takes me with him.

PESTERA, *August* 1.

The task which has been set Mr. Baring and Mr. Schuyler is not an enviable one. They have both gone to work in the most earnest manner, and are visiting all the principal towns and villages that were burnt by the Bashi-Bazouks, in order to see with their own eyes the ruin that has been worked, and to hear with their own ears the stories of the villagers. This necessitates travelling from five to fifteen hours a day over roads the best of which are nearly impassable for carriages, beneath a burning sun, rendered almost insupportable by the close sultry atmosphere of August. Mr. Baring has already been ill twice, owing to over-exertion, hard work, and the overpowering heat; and even Mr. Schuyler, inured to the fatigue of this kind of work by his long journey through Turkestan, seemed to find it as much as he could stand.

But the hard work and the heat, and the wearisome round of investigation, of questions repeated over and over again, of listening to the same sort of stories told a hundred times over, of sifting and comparing evidence, would be nothing, and might be easily borne. It is the heart-rending cries of despair that shake you, the crowds of weeping women and children that meet and follow us everywhere—women and children, poor trembling creatures, who are homeless and starving—widows and orphans who are weeping for husbands and fathers slain, and who have not a roof to shelter them, nor bread for the morrow. It is this that makes the task that has been set Mr. Baring and Mr. Schuyler one which they will hardly care to ever undertake again.

We have just passed through the village of Raddovo on our way here, where we stop for the night before continuing to-morrow to Batak. Raddovo was apparently a very flourishing little place, and, to tell the truth, it has suffered less, perhaps, than the majority of the towns that were left to the tender care of the Bashi-Bazouks. It was a village of 160 houses, of which not one is left standing, and the inhabitants are now living under sheds of straw, constructed in nooks and corners of the black and crumbling walls. They gathered around us when we stopped in the middle of the once flourishing place, and timidly told us their story. They had offered no resistance at all to the Bashi-Bazouks, but simply ran away when they heard the Turks were coming. Having received timely notice, they had nearly all escaped, and only twenty-two men had been killed in all. The women and children had all been saved. Of the twenty-two killed, eight had been arrested after the inhabitants returned to the village, and were brutally slaughtered in cold blood while being taken to Philippopolis to prison. We had heard that eight bodies were found one day on the road near Philippopolis long after the affair was over, and had been told by the Turks that these were bodies of people killed during the insurrection, which had been transported there by some unknown means. When the people returned to their smoking homes, they found themselves completely ruined. There was not a stick of furniture nor a cooking utensil left, and all their cattle, sheep, and horses had been driven off. Their harvests were still standing in the fields, and they are unable to gather and save them without their cattle, which the Turks refuse to restore. Each family had on an average two pairs of oxen, making about 320 pairs in the whole village. Of these only thirty-three pairs were returned, which are utterly inadequate for gathering and saving the harvest. They besides will have to rebuild their houses, and for this purpose it will be necessary to draw wood a long distance from the mountains, and it will be impossible for them to do this before winter. Unless the poor people can get back their cattle, gather their harvests, and rebuild their houses, they will be in a state of destitution by next winter fearful to think of. The Turkish authorities have informed Mr. Schuyler everywhere that the cattle were being restored to the burnt villages, and that help would be given the people to rebuild their houses, and everywhere the people tell him that the cattle are not restored, and that no help of any kind is given them. I am convinced that not the slightest reliance can be placed in the promises of the Turkish authorities, and that they have no intention of fulfilling their promises when they make them. They are simply made to throw dust in the eyes of Europe, for although they have not patriotism enough to know or care whether they themselves ruin the country or not, they have a very lively fear of a European intervention, and are ready to promise anything to avert it. As for the execution of these promises they know that can be avoided. As though in very contempt for the promises and assurances given to Mr. Baring and Mr. Schuyler, they are everywhere sending out at this moment, and demanding the payment of taxes in the burnt and ruined villages, just as though nothing had happened. On this village of Raddovo, for instance, a tax of four hundred pounds has been levied, which it is utterly impossible for the poor people to pay. The pretext for the burning of this village was the killing of two zaptiehs, or rural policemen, here. The inhabitants flatly deny that any zaptieh was killed in or about the village, or that they ever raised a hand against the Turks. As in other villages where Turks have been killed, the people always confess it, I believe that here they tell the truth, and that there was no other cause for the attack than the desire for plunder on the part of the Turks. This is

also, I believe, Mr. Schuyler's opinion. We walked through the village, which presented a sad spectacle of ruin.

Many of the people seemed to have returned, each family, to the blackened walls of their former homes, where they had constructed in the corner of the walls a sort of shelter with the aid of a few poles and a little straw. Some had a coverlet or two, others straw to sleep on, and many seemed to sleep on the bare ground. I saw one sick woman groaning with pain, lying with only a thin coverlet between her and the damp ground, while a little girl sat beside her and continually bathed her head with cold water. In some places the chimneys were still standing, and here were some cooking their meals, though God knows they had little enough to cook. Taking leave of the village, we continued our road to Pestera, where we had decided to pass the night, and after an hour's drive over a very bad road, and an upset in which one of our party narrowly escaped being killed, we arrived at the village. We were shown to the house of a Bulgarian, who offered us his hospitality, and in half an hour we received the visit of the Mudir of the village, accompanied by two officials from Tatar Bazardjik. After the interchange of various compliments, it turned out that one of these officials had been sent by the Kaimakam of Tatar Bazardjik to accompany us to Batak. To this Mr. Schuyler decidedly objected, and a long discussion ensued, at the end of which he informed them in the most peremptory manner that he would allow no official to accompany him, and this ended the matter. The Bulgarian was delighted to entertain us and gave us an excellent supper, to which we did ample justice, but I cannot say so much for the sleeping accommodations he offered us. We all occupied the same room, and slept on divans extended around the walls, which were anything but downy; but the hospitality shown us was so hearty and cordial that we scarcely thought of beds.

The poor people were only too glad to receive our party of five, and to offer us the best they had, for they looked to us, strangers as we were, for encouragement and protection against their Mussulman riders. As soon as the Mudir went away, what appeared to be the whole population of the town seemed to flock into the courtyard of our house, anxious to shake hands with us, or to tell us their tales of woe. The people who had these stories to tell us we soon found were not the people of the place, but of Batak, the town to which we were bound on the morrow, who had come here to beg a little assistance from their more lucky neighbours, and who now flocked around us with their plaints. They were mostly women who had lost their husbands, and in many cases their children, whose houses had been burnt, and who, from a condition of ease and independence, had been reduced to starvation and widowhood. They were of all ages, from eighteen up to eighty; young mothers with children in their arms and two or three hanging to their skirts; middle-aged women who had grown-up sons and daughters that had fallen under the sharp edge of the sword; old grandmothers with children and grandchildren all swept away at one fell swoop. They all told their stories with sobs and tears, beating their heads and wringing their hands in despair. And they were starving and houseless. We could not relieve their misery. We could only listen to their stories with saddened faces, and tell them to hope for better times, and promise to do something for them, if possible, when we should return to Constantinople. Vain hopes, and, I fear, vainer promises.

TATAR BAZARDJIK, *August* 2.

Since my letter of yesterday I have supped full of horrors. Nothing has yet been said of the Turks that I do not now believe; nothing could be said of them that I should not think probable and likely. There is, it would seem, a point in atrocity beyond which discrimination is impossible, when mere com- parison, calculation, measurement, are out of the question, and this point the Turks have already passed. You can follow them no further. The way is blocked up by mountains of hideous facts, beyond which you cannot see and do not care to go. You feel that it is superfluous to continue measuring these mountains and deciding whether they be a few feet higher or lower, and you do not care to go seeking for molehills among them. You feel that it is time to turn back; that you have seen enough.

But let me tell what we saw at Batak:—We had some difficulty in getting away from Pestera. The authorities were offended because Mr. Schuyler refused to take any Turkish official with him, and they ordered the inhabitants to tell us there were no horses, for we had here to leave our carriages and take to the saddle. But the people were so anxious we should go, that they furnished horses in spite of the prohibition, only bringing them first without saddles, by way of showing how reluctantly they did it. We asked them if they could not bring us some saddles also, and this they did with much alacrity, and some chuckling at the way in which the Mudir's orders were walked over. Finally we mounted and got off. We had been besieged all the morning by the same people who had blockaded us the night before, or who appeared to be the same, their stories were so much alike.

We could do nothing but listen in pity to a few of them—for it would have taken all day to hear each separate tale of misery and suffering—and gave vague promises that we would do all in our power to relieve their misery upon our return to Constantinople. But diplomatic help is, alas! very slow. While ambassadors are exchanging notes and compliments, inviting each other to dinner, making representations to the Porte, and obtaining promises which nobody believes in, these poor people are starving and dying. Many of them decided to seize this opportunity and accompany us to Batak, to visit their ruined homes, and others caught our bridle

reins, determined to make us listen to their stories before we should start. One woman caught my horse, and held it until she could show me where a bullet had traversed her arm, completely disabling her from work, and this was only the least of her woes. Husband killed, and little children depending on that broken arm for bread; all of this told in a language so much like Russian that I could understand a great deal of it; so like Russian that I could easily have fancied myself amongst peasants of the Volga, or the denizens of the Gostinoi-dvor, Moscow. The resemblance is striking, and it is no wonder the Russians sympathise with these people.

You observe the same sort of family likeness about the eyes, that may be always seen among brothers and sisters who are utterly unlike each other in features—tricks of countenance, movements of the hands, tones of the voice, even to that curious, uncertain expression of the face, which often in the Russian peasant makes it almost impossible to tell whether he is laughing or crying. A Russian, a Bulgarian, a Servian, a Montenegrin, and a Tchek may meet and talk, each in his own language, and all understand each other. You might as well expect the English north of the Thames not to sympathise with those south of it, in case the latter were under the domination of the Turks, as to try to prevent these Sclavonic races from helping each other, while groaning under a foreign despotism.

Batak is situated about thirty miles south of Tatar Bazardjik as the crow flies, high up in the spur of the Balkans that here sweeps around to the south from the main range. The road was only a steep mountain path that in places might have tried the agility of a goat. There was a better one, as we learned upon our return, but, with that perversity which distinguishes the Oriental mind, our guide took this one instead. We formed a curious but a somewhat lugubrious procession as we wound up the steep mountain side. First there were our two zaptiehs in their picturesque costumes, bristling with knives and pistols, our guide likewise armed to the teeth, then the five persons who composed our party, mounted on mules and horses decked out with nondescript saddles and trappings, followed by a procession of fifty or sixty women and children who had resolved to accompany us to Batak. Many of the women carried a small child, and a heavy burthen besides, comprising the provisions, clothing, cooking utensils, or harvesting implements, they had begged or borrowed in Pestera. Even children—little girls of nine and ten years—were trudging wearily up the steep mountain side under burthens too heavy for them; and they would be five or six hours in reaching their destination.

After three hours' climbing by paths so steep that we were obliged to dismount and walk half the time without then seeming quite safe from rolling down into some abyss, mounting higher and higher until we seemed to have got among the clouds, we at last emerged from a thick wood into a delightful little valley that spread out a rich carpet of verdure before our eyes. A little stream came murmuring down through it, upon which there was built a miniature saw-mill It appears that the people in Batak did a considerable trade in timber, which they worked up from the forests on the surrounding mountains, for we afterwards observed a great number of these little mills, and were even told there were over two hundred in and about the village.

The mill-wheels are silent now. This little valley, with its rich grassy slopes, ought to have been covered with herds of sheep and cattle. Not one was to be seen. The pretty little place was as lonely as a graveyard, or as though no living thing had trod its rich greensward for years. We ascended the slope to the right, and when we reached the top of the ridge which separated it from the next valley, we had a beautiful panorama spread out before us. The mountains here seemed to extend around in a circle, enclosing a tract of country some eight or ten miles in diameter, considerably lower down, which was cut up by a great number of deep hollows and ravines that traversed it in every direction, and seemed to cross and cut off each other without the slightest appearance of anything like reference to a watershed. It looked more like an enlarged photograph of the mountains of the moon than anything else I could think of.

Down in the bottom of one of these hollows we could make out a village, which our guide informed us it would still take us an hour and a half to reach, although it really seemed to be very near. This was the village of Batak, which we were in search of. The hillsides were covered with little fields of wheat and rye, that were golden with ripeness. But although the harvest was ripe, and over ripe, although in many places the well-filled ears had broken down the fast-decaying straw that could no longer hold them aloft, and were now lying flat, there was no sign of reapers trying to save them. The fields were as deserted as the little valley, and the harvest was rotting in the soil. In an hour we had neared the village.

As we approached our attention was directed to some dogs on a slope overlooking the town. We turned aside from the road, and, passing over the debris of two or three walls, and through several gardens, urged our horses up the ascent towards the dogs. They barked at us in an angry manner, and then ran off into the adjoining fields. I observed nothing peculiar as we mounted, until my horse stumbled. When looking down I perceived he had stepped on a human skull partly hid among the grass. It was quite dry and hard, and might, to all appearances, have been there for two or three years, so well had the dogs done their work. A few steps further there was another, and beside it part of a skeleton, likewise white and dry. As we ascended, bones, skeletons, and skulls became more frequent, but here they had not been picked so clean, for there were fragments of half-dry, half-putrid flesh still clinging to them. At last we came to a kind of little plateau or shelf on the

hillside, where the ground was nearly level, with the exception of a little indentation where the head of a hollow broke through. We rode towards this, with the intention of crossing it, but all suddenly drew rein with an exclamation of horror, for right before us, almost beneath our horses' feet, was a sight that made us shudder. It was a heap of skulls, intermingled with bones from all parts of the human body, skeletons, nearly entire, rotting, clothing, human hair, and putrid flesh lying there in one foul heap, around which the grass was growing luxuriantly. It emitted a sickening odour, like that of a dead horse, and it was here the dogs had been seeking a hasty repast when our untimely approach interrupted them.

In the midst of this heap I could distinguish one slight skeleton form still enclosed in a chemise, the skull wrapped about with a coloured handkerchief, and the bony ankles encased in the embroidered footless stockings worn by the Bulgarian girls. We looked about us. The ground was strewed with bones in every direction, where the dogs had carried them off to gnaw them at their leisure. At the distance of a hundred yards beneath us lay the town. As seen from our stand-point, it reminded one somewhat of the ruins of Herculaneum or Pompeii.

There was not a roof left, not a whole wall standing; all was a mass of ruins, from which arose, as we listened, a low plaintive wail, like the "keening" of the Irish over their dead, that filled the little valley and gave it voice. We had the explanation of this curious sound when we afterwards descended into the village. We looked again at the heap of skulls and skeletons before us, and we observed that they were all small, and that the articles of clothing, intermingled with them and lying about, were all parts of women's apparel. These, then, were all women and girls. From my saddle I counted about a hundred skulls, not including those that were hidden beneath the others in the ghastly heap, nor those that were scattered far and wide through the fields. The skulls were nearly all separated from the rest of the bones, the skeletons were nearly all headless. These women had all been beheaded. We descended into the town. Within the shattered walls of the first house we came to was a woman sitting on a heap of rubbish, rocking herself to and fro, wailing a kind of monotonous chant, half sung, half sobbed, that was not without a wild discordant melody. In her lap she held a babe, and another child sat beside her patiently and silently, and looked at us as we passed with wondering eyes. She paid no attention to us; but we bent our ear to hear what she was saying, and our interpreter said it was as follows:—"My home, my home, my poor home, my sweet home; my husband, my husband, my poor husband, my dear husband; my home, my sweet home," and so on, repeating the same words over and over again a thousand times. In the next house were two, engaged in the same way; one old, the other young, repeating words nearly identical, "I had a home, and now I have none; I had a husband, and now I am a widow; I had a son, and now I have none; I had five children, and now I have one," while rocking themselves to and fro, beating their heads and wringing their hands. These were women who had escaped from the massacre, and had only just returned for the first time, having taken advantage of our visit or that of Mr. Baring to do so. They might have returned long ago, but their terror was so great that they had not dared, without the presence and protection of a foreigner, and now they would go on for hours in this way, "keening" this kind of funeral dirge over their ruined homes. This was the explanation of the curious sound we had heard when up on the hill. As we advanced there were more and more; some sitting on the heaps of stones that covered the floors of their houses; others walking up and down before their doors, wringing their hands and repeating the same despairing wail. There were few tears in this universal mourning. It was dry, hard, and despairing. The fountain of tears had been dried up weeks before, but the tide of sorrow and misery was as great as ever, and had to find vent without their aid. As we proceeded most of thorn fell into line behind us, and they finally formed a procession of four or five hundred people, mostly women and children, who followed us about wherever we went with their mournful cries. Such a sound as their united voices sent up to heaven I hope never to hear again.

It may be well, before going further, to say something about Batak, so that the reader may form a better idea of what took place here. It was a place of nine hundred houses, and about 8,000 or 9,000 inhabitants. As there are no census statistics, nor, indeed, trustworthy statistics of any other kind in Turkey, it is impossible to tell exactly what the population of any place is or was. But the ordinary rule of calculating five persons to the house will not hold good in Bulgaria. The Bulgarians, like the Russian peasantry, adhere to the old patriarchal method, and fathers and married sons, with their children and children's children, live under the same roof until the grandfather dies. As each son in his turn gets married, a new room is added to the old building, until with the new generation there will often be twenty or thirty people living under the same roof, all paying obedience and respect to the head of the family. In estimating the population, therefore, by the number of houses, somewhere between eight and ten souls must be counted as the average. Edip Effendi, in his report, states that there were only about 1,400 inhabitants in the village, all told. A more impudent falsehood was never uttered, even by a Turk. Mr. Schuyler has obtained their tax-list for this year, and finds that there were 1,421 able-bodied men assessed to pay the military exemption tax. This number in any European country would indicate a population of about 15,000, but here it would not give more than from 8,000 to 10,000 souls, all told, and this is the figure at which the population of the place is estimated by the inhabitants, as well as by the

people of Pestera.

I think people in England and Europe generally have a very imperfect idea of what these Bulgarians are. I have always heard them spoken of as mere savages, who were in reality not much more civilized than the American Indians; and I confess that I myself was not far from entertaining the same opinion not very long ago. I was astonished, as I believe most of my readers will be, to learn that there is scarcely a Bulgarian village without its school; that these schools arc, where they have not been burnt by the Turks, in a very flourishing condition; that they are supported by a voluntary tax levied by the Bulgarians on themselves, not only without being forced to do it by the Government, but in spite of all sorts of obstacles thrown in their way by the perversity of the Turkish authorities; that the instruction given in these schools is gratuitous, and that all profit alike by it, poor as well as rich; that there is scarcely a Bulgarian child that cannot read and write; and, finally, that the percentage of people who can read and write is as great in Bulgaria as in England and France. Do the people who speak of the Bulgarians as savages happen to be aware of these facts? Again, I had thought that the burning of a Bulgarian village meant the burning of a few mud huts that were in reality of little value, and that could be easily rebuilt. I was very much astonished to find that the majority of these villages are in reality well-built towns, with solid stone houses, and that there are in all of them a comparatively large number of people who have attained to something like comfort, and that some of the villages might stand a not very unfavourable comparison with an English or French village. The truth is that these Bulgarians, instead of the savages we have taken them for, are in reality a hardworking, industrious, honest, civilized, and peaceful people. Now, as regards the insurrection, there was a weak attempt at an insurrection in three or four villages, but none whatever in Batak, and it does not appear that a single Turk was killed here.

The Turkish authorities do not even pretend that there was any Turk killed here, or that the inhabitants offered any resistance whatever. When Achmet-Agha, who commanded the massacre, came with the Bashi-Bazouks and demanded the surrender of their arms, they at first refused, but offered to deliver them to the regular troops or to the Kaimakam at Tatar Bazardjik. This, however, Achmet-Agha refused to allow, and insisted upon their arms being delivered to him and his Bashi-Bazouks. After considerable hesitation and parleying this was done. It must not be supposed that these were arms that the inhabitants had especially prepared for an insurrection. They were simply the arms that everybody, Christians and Turks alike, carried and wore openly, as is the custom here. What followed the delivery of the arms will best be understood by the continuation of the recital of what we saw yesterday. At the point where we descended into the principal street of the place, the people who had gathered around us pointed to a heap of ashes by the roadside, among which could be distinguished a great number of calcined bones. Here a heap of dead bodies had been burnt, and it would seem that the Turks had been making some futile and misdirected attempts at cremation.

A little further on we came to an object that filled us with pity and horror. It was the skeleton of a young girl not more than fifteen, lying by the roadside, and partly covered with the débris of a fallen wall. It was still clothed in a chemise; the ankles were enclosed in footless stockings; but the little feet, from which the shoes had been taken, were naked, and owing to the fact that the flesh had dried instead of decomposing, were nearly perfect. There was a large gash in the skull, to which a mass of rich brown hair nearly a yard long still clung, trailing in the dust. It is to be remarked that all the skeletons of women found here were dressed in a chemise only, and this poor child had evidently been stripped to her chemise, partly in the search for money and jewels, partly out of mere brutality, then outraged, and afterwards killed. We have talked with many women who had passed through all parts of the ordeal but the last, and the procedure seems to have been as follows : They would seize a woman, strip her carefully to her chemise, laying aside articles of clothing that were valuable, with any ornaments and jewels she might have about her. Then as many of them as cared would violate her, and the last man would kill her or not as the humour took him.

At the next house a man stopped us to show where a blind little brother had been burnt alive, and the spot where he had found his calcined bones, and the rough, hard-visaged man sat down and sobbed like a child. The foolish fellow did not seem to understand that the poor blind boy was better off now, and that he ought really to have thanked the Turks instead of crying about it.

On the other side of the way were the skeletons of two children lying side by side, partly covered with stones, and with frightful sabre cuts in their little skulls. The number of children killed in these massacres is something enormous. They were often spitted on bayonets, and we have several stories from eye-witnesses who saw little babes carried about the streets, both here and at Otluk-kui, on the point of bayonets. The reason is simple. When a Mahometan has killed a certain number of infidels, he is sure of Paradise, no matter what his sins may be. Mahomet probably intended that only armed men should count, but the ordinary Mussulman takes the precept in broader acceptation, and counts women and children as well. Here in Batak the Bashi-Bazouks, in order to swell the count, ripped open pregnant women, and killed the unborn infants. As we approached the middle of the town, bones, skeletons, and skulls became more numerous. There was not a house beneath the ruins of which we did not perceive human remains, and the street besides was strewn with them. Before many

of the doorways women were walking up and down wailing their funeral chant. One of them caught me by the arm and led me inside of the walls, and there in one corner, half covered with stones and mortar, were the remains of another young girl, with her long hair flowing wildly about among the stones and dust. And the mother fairly shrieked with agony, and beat her head madly against the wall. I could only turn round and walk out sick at heart, leaving her alone with her skeleton. A few steps further on sat a woman on a doorstep, rocking herself to and fro, and uttering moans heartrending beyond anything I could have imagined. Her head was buried in her hands, while her fingers were unconsciously twisting and tearing her hair as she gazed into her lap, where lay three little skulls with the hair still clinging to them. How did the mother come to be saved, while the children were slaughtered? Who knows? Perhaps she was away from the village when the massacre occurred. Perhaps she had escaped with a babe in her arms, leaving these to be saved by the father; or perhaps, most fearful, most pitiful of all, she had been so terror-stricken that she had abandoned the three poor little ones to their fate and saved her own life by flight. If this be so, no wonder she is tearing her hair in that terribly unconscious way as she gazes at the three little heads lying in her lap.

And now we begin to approach the church and the school-house. The ground is covered here with skeletons, to which are clinging articles of clothing and bits of putrid flesh; the air is heavy with a faint sickening odour, that grows stronger as we advance. It is beginning to be horrible. The school is on one side of the road, the church on the other. The schoolhouse, to judge by the walls that are in part standing, was a fine large building, capable of accommodating two or three hundred children. Beneath the stones and rubbish that cover the floor to the height of several feet, are the bones and ashes of 200 women and children burnt alive between those four walls. Just beside the school house is a broad shallow pit. Here were buried a hundred bodies two weeks after the massacre. But the dogs uncovered them in part. The water flowed in, and now it lies there a horrid cesspool, with human remains floating about or lying half exposed in the mud. Near by, on the banks of the little stream that runs through the village, is a sawmill. The wheel-pit beneath is full of dead bodies floating in the water. The banks of this stream were at one time literally covered with corpses of men and women, young girls and children, that lay there, festering in the sun, and eaten by dogs. But the pitiful sky rained down a torrent upon them, and the little stream swelled and rose up and carried the bodies away, and strewed them far down its grassy banks, through its narrow gorges and dark defiles beneath the thick underbrush and the shady woods as far as Pestera, and even Tatar Bazardjik, forty miles distant. We entered the churchyard, but the odour here became so bad that it was almost impossible to proceed. We took a handful of tobacco, and held it to our noses while we continued our investigations.

The church was not a very large one, and it was surrounded by a low stone wall, enclosing a small churchyard about fifty yards wide by seventy-five long. At first we perceive nothing in particular, and the stench is so great that we scarcely care to look about us, but we see that the place is heaped up with stones and rubbish to the height of five or six feet above the level of the street, and upon inspection we discover that what appeared to be a mass of stones and rubbish is in reality an immense heap of human bodies covered over with a thin layer of stones. The whole of the little churchyard is heaped up with them to the depth of three or four feet, and it is from here that the fearful odour comes. Some weeks after the massacre, orders were sent to bury the dead. But the stench at that time had become so deadly that it was impossible to execute the order, or even to remain in the neighbourhood of the village. The men sent to perform the work contented themselves with burying a few bodies, throwing a little earth over others as they lay, and here in the churchyard they had tried to cover this immense heap of festering humanity by throwing in stones and rubbish over the walls, without daring to enter. They had only partially succeeded. The dogs had been at work there since, and now could be seen projecting from this monster grave, heads, arms, legs, feet, and hands, in horrid confusion. We were told there were three thousand people lying here in this little churchyard alone, and we could well believe it. It was a fearful sight—a sight to haunt one through life. There were little curly heads there in that festering mass, crushed down by heavy stones; little feet not as long as your finger on which the flesh was dried hard, by the ardent heat before it had time to decompose; little baby hands stretched out as if for help; babes that had died wondering at the bright gleam of sabres and the red hands of the fierce-eyed men who wielded them; children who had died shrinking with fright and terror; young girls who had died weeping and sobbing and begging for mercy; mothers who died trying to shield their little ones with their own weak bodies, all lying there together, festering in one horrid mass. They are silent enough now. There are no tears nor cries, no weeping, no shrieks of terror, nor prayers for mercy. The harvests are rotting in the fields, and the reapers are rotting here in the churchyard.

We looked into the church which had been blackened by the burning of the woodwork, but not destroyed, nor even much injured. It was a low building with a low roof, supported by heavy irregular arches, that as we looked in seemed scarcely high enough for a tall man to stand under. What we saw there was too frightful for more than a hasty glance. An immense number of bodies had been partly burnt there and the charred and blackened remains, that seemed to fill it half way up to the low dark arches and make them lower and darker

still, were lying in a state of putrefaction too frightful to look upon. I had never imagined anything so horrible. We all turned away sick and faint, and staggered out of the fearful pest house glad to get into the street again. We walked about the place and saw the same things repeated over and over a hundred times. Skeletons of men with the clothing and flesh still hanging to and rotting together; skulls of women, with the hair dragging in the dust, bones of children and of infants everywhere. Here they show us a house where twenty people were burned alive; there another where a dozen girls had taken refuge, and been slaughtered to the last one, as their bones amply testified. Everywhere horrors upon horrors.

There were no dogs in the place, as they had all been driven away when the inhabitants began to return, and only hung around the outskirts of the village; but I saw one or two cats, fat and sleek, that sat complacently upon the walls and watched us with sleepy eyes. It may be asked why the people who are in the village now do not bury these skeletons and these bones, instead of allowing them to be gnawed by the dogs and cats. Some of those who have been able to identify the bones of friends have made weak attempts at burying them. But they have no spades to dig graves with, and they are weak and starving. Besides, many of the survivors are women, who have made fruitless efforts to keep the bodies of loved ones covered with a little earth. We had ample proof that wherever bones could be identified, they were tenderly cared for. We saw many well-kept graves decorated with flowers. We saw others that had been uncovered by the rain or the dogs, leaving parts of the skeleton exposed, that were still decorated with flowers. We even saw skulls lying on the ground, within a doorway or a garden wall, with a bouquet of flowers lying upon them, as though some one was caring for them, and was yet loth to bury them away out of sight. I saw one half buried, with the face upward, and its hollow eyes gazing reproachfully up at the sunny sky, with a bouquet carefully placed in its mouth; but most of these skeletons and bones have nobody to look after them. Of the eight or nine thousand people who made up the population of the place, there are only twelve or fifteen hundred left, and they have neither tools to dig graves with nor strength to use spades if they had them. But why have the Turkish authorities not buried them out of sight? The Turkish authorities will tell you they have buried them, and that there were very few to bury.

Of all the cruel, brutal, ferocious things the Turks ever did, the massacre of Batak is among the worst! Of all the mad, foolish things they ever did, leaving these bodies to lie here rotting for three months unburied is probably the maddest and most foolish! But this village was in an isolated, out-of-the-way place, difficult of access, and they never thought Europeans would go poking their noses here, so they cynically said, "These Christians are not even worth burial, let the dogs eat them."

We talked to many of the people, but we had not the heart to listen to many of their stories in detail, and we restricted ourselves to simply asking them the number lost in each family. No other method would probably give a better idea of the fearful character of the massacre, and the way in which whole families were swept out of existence. "How many were in your family?" we would ask. "Ten," the answer would be, perhaps. "How many remain?" "Two." "How many in yours?" "Eight." "How many remain?" "Three." "How many in yours?" "Fifteen." "How many remain?" "Five." And so on in families numbering from five to twenty, in which only remained from one to five persons. One old woman came to us, wringing her hands, and crying in that hard tearless manner of which I have already spoken, and when we could get her sufficiently calmed to tell us her story, she said she had three tall handsome sons, Ghiorghy, Ivantchu, and Stoyan, and they were all married to good and dutiful wives, Reika, Stoyanka, and Anka, and they had between them twelve beautiful children, Anghel and Tragan and Ghiorghy and Ivantchu, Letko, Assen, Boydan, Stoyan, Tonka, Gingka, Marika, and Reika, so that the family counted, all told, nineteen persons living under the same roof. Of all this large flourishing family, the tall handsome sons, the dutiful wives, and the twelve beautiful children, there remained only this poor old grandmother. They were all brutally slaughtered to the last one. Of this flourishing family tree there remained only this lifeless withered trunk, and the poor old woman sat down and beat her head, and fairly screamed out her despair. There was an old man who told us of his uncle, Blagoi Christostoff, a venerable patriarch of the grand old type. He had five sons married, who had among them twenty-seven children, thus making a family that with the wives counted up a sum total of thirty-nine persons living under the same roof. Of this enormous family there are only eight left.

We might have gone on for hours listening to these stories had we but time. There was another family of twenty-five, of whom seven were left; one of twenty, of whom eight were left; numbers of them of ten to fifteen, of whom one to five were left; and we heard besides of many families that had been completely annihilated, not one remaining. The people who committed this wholesale slaughter were not Circassians, as has been supposed, but the Turks of the neighbouring villages, led by the Achmet-Agha already spoken of. The village of Batak was comparatively rich and prosperous; it had excited the envy and jealousy of its Turkish neighbours, and the opportunities of plunder offered a temptation to the Turks which, combined with their religious fanaticism and the pretext of an insurrection in another part of the country, was more than they could resist. The man Achmet-Agha, who commanded the slaughter, has not been punished, and will not be, but, on the contrary, he has been promoted to the rank of Yuz-bashi, and decorated.

We are told that any number of children and young girls had been carried off; that it was known in what Turkish villages they were kept, and that the Turks simply refused to restore them to their parents. Mr. Schuyler afterwards obtained a list, with the names and ages of eighty-seven girls and boys that had been carried off with the name of the village in which each was kept.

As to the present condition of the people who are here, it is simply fearful to think of. The Turkish authorities have built a few wooden sheds in the outskirts of the village in which they sleep, but they have nothing to live upon but what they can beg or borrow from their neighbours. And in addition to this the Turkish authorities, with that cool cynicism and utter disregard of European demands for which they are so distinguished, have ordered these people to pay their regular taxes and war contributions just as though nothing had happened. Ask the Porte about this at Constantinople, and it will be denied, with the most plausible protestations and the most reassuring promises that everything will be done to help the sufferers. But everywhere the people of the burnt villages come to Mr. Schuyler with the same story—that unless they pay their taxes and war contributions they are threatened with expulsion from the nooks and corners of the crumbling walls where they have found a temporary shelter. It is simply impossible for them to pay, and what will be the result of these demands it is not easy to foretell. But the Government needs money badly, and must have it. Each village must make up its ordinary quota of taxes, and the living must pay for the dead.

We asked about the skulls and bones we had seen up on the hill upon first arriving in the village where the dogs had barked at us. These, we were told, were the bones of about 200 young girls, who had first been captured and particularly reserved for a worse fate than death. They had been kept till the last; they had been in the hands of their captors for several days—for the burning and the pillaging had not all been accomplished in a single day—and during this time they had suffered all it was possible that poor weak trembling girls could suffer at the hands of brutal savages. Then, when the town had been pillaged and burnt, when all their friends had been slaughtered, these poor young things, whose very wrongs should have insured them safety, whose very outrages should have insured them protection, were taken, in the broad light of day, beneath the smiling canopy of heaven, coolly beheaded, then thrown in a heap there, and loft to rot.

Mr. Disraeli was right when he wittily remarked that the Turks usually terminated their connection with people who fell into their hands in a more expeditious manner than by imprisoning them. And so they do. Mr. Disraeli was right. At the time he made that very witty remark, these young girls had been lying there many days.

PHILIPPOPOLIS, *August* 10.

I had not been here a day when I heard of a personage whom the Turks jeeringly spoke of as the "Queen of the Bulgarians." This Queen, it appeared, was in prison, and was, I was given to understand, a very contemptible sort of person indeed. I learned that she had headed the insurrection, had been crowned Queen, had promenaded the streets of her native village on horseback, bearing a flag like another Jeanne d' Arc, besides committing a variety of other follies which seemed to form the subject of much merriment among the Turks here. Naturally I conceived a great desire to make the acquaintance of this fallen Queen, and see what sort of person it was who aspired to be the leader of a new Sclavonic Empire. I had no difficulty in accomplishing this, as Mr. Schuyler had no sooner heard of her than he demanded and obtained permission to see her, and kindly allowed me to accompany him. She was confined in the house of an Imam, or priest, with another Bulgarian woman from the same village, and these were the only two women we found in prison upon our arrival here. We were conducted to the Imam's house by Dr. Vlados, a Greek physician, who has been charged with the task of looking after the health of the prisoners. After a long walk through the crooked, narrow, stony streets, we brought up before a low, rickety building, partly of wood, partly of rough unhewn stones, and found ourselves before a pair of low, double wooden doors opening outwards into the street. The doctor knocked, and after a prolonged colloquy with a voice inside, the door was opened about half an inch, and we caught sight of a harsh-looking, partly-veiled female face, that seemed to be regarding us with some suspicion. Apparently, this preliminary survey was satisfactory, for the door was thrown open a little wider, and a slight girlish figure stepped forward and stood in the doorway, followed by an elderly matron, tall and stalwart almost as a man, who stood behind and gazed at us over the girl's head with tearful eyes.

I was at first inclined to think it was the tall woman who must be the Queen, as she more nearly filled my ideas of what an Amazon should be, and I was surprised to learn that it was not she but the young girl who had been playing at "Kings and Queens" with such disastrous effect to herself. A slight, graceful form, only too plainly seen through her scanty, miserable clothing, large hazel eyes, an oval face, slightly browned by the sun, straight nose, and a veritable little rosebud of a mouth. She was thin and weak, and seemed scarcely able to stand, and the young girlish face wore a dejected, brokenhearted look that was sad to see. A handkerchief was thrown over her head, and she wore a coarse brown linsey-woolsey jacket and a short petticoat of the same material that scarcely reached below her knees, exposing a white delicate foot. She had no shoes and stockings, and this costume she afterwards told me was not her own, but was given her after she had been stripped of her

own clothing. She told us her story in a few words, from which it appeared she had taken some part in the insurrection indirectly, but that the report of her having been crowned Queen of the Bulgarians was a pure fiction. The name "Queen of the Bulgarians" had been given her by the Turks in mockery, coupled with the vilest epithets and insults that a cowardly brutal soldiery could think of. She had been in prison two months, and during all this time had been given nothing to eat but bread and water. It was no wonder she looked weak and ill. As she was evidently too weak to stand talking there long; Mr. Schuyler told her he would try to have her set at liberty as soon as possible, and then we took our leave.

This visit of Mr. Schuyler's and the interest he showed in her, resulted in her being released next day on bail, to be definitely set at liberty a few days later. I paid her a visit the day after in the khan or caravansary where she with her companion had found a temporary shelter, and obtained her story in detail. As it is intimately connected with these Bulgarian massacres, and will at the same time give an idea of the condition of the Bulgarian people, I may as well give it in full, as she gave it to me. Her name is "Raika," and she is the daughter of a priest in the village of Otluk-kui, or Panagurishti, about twenty miles from Tatar-Bazardjik. At the age of twelve she had been already remarked for her intelligence and beauty, and a kind of village literary club, which exists in the place, decided to send her to school and educate her. For this purpose a subscription was set afoot, and the requisite funds were soon raised. They decided to send her to Eski-Zara, where the American missionaries had established a school for girls, which they afterwards turned over to the Bulgarians, by whom it is now conducted.

It may not be amiss to remark here that the American and English missionaries have done an immense deal of good in Bulgaria by establishing schools throughout the country, educating teachers, and showing the Bulgarians how to organise and establish schools for themselves. In this they have succeeded so well that there is scarcely a village in Bulgaria without its school. Raika remained at this school four years, and acquired seemingly a very fair education; better, perhaps, than many an English girl gets in a better school. She had a particular fondness for needlework, and she acquired so much skill in all sorts of curious and tasteful embroidery that she became famous throughout all the country. When she returned to her native place, after four years' study in a boarding-school, she was looked upon as a veritable marvel by all the people around her. It was particularly the wonders she worked with her needle that astonished and pleased them, and this, with her wonderful education and her sweetness of character, made them begin to look up to her as a being of a superior order. She was now sixteen, and there was a career already marked out for her—that of a teacher; and she entered upon it gladly. The schools in Otluk-kui, or Panagurishti, as it is called by the Bulgarians, were at that time in a very flourishing condition. Since hearing Raika's story I have been there, and I took pains to inquire into the matter. There were three schools in the place—one for girls and two for boys; and, to judge by the ruins which I saw, they were fine large buildings that no village of the same size, even in the civilised part of Europe, need have been ashamed of. There were six teachers in all—three male and three female; and the number of children that attended the schools was 680, of whom 500 were boys, and 180 girls. The teachers were well paid—better, I think, everything considered, than they are in England, France, and Germany. The three male teachers and Raika received each sixty pounds a year, a sum which, in this country, where living is cheap, where no; great expenditure is required in the way of dress, and in a mountain village far away from railways and telegraphs, was really a very comfortable income. For a young girl like Raika especially, who had her home, it was a great deal of money. She applied half of it, however, to paying back to the literary society the money spent on her education. She soon became the head mistress of the girls' school, and as she was the only one of the teachers who was a native of the village, she was a great favourite of the people.

It should be remembered that the schools in Bulgaria are supported by a kind of tax which the Bulgarians voluntarily levy upon themselves; and the flourishing condition of the schools in one little place like this, and the way in which they were supported, will enable us to form an idea of what they are all over the country, and of the efforts these poor people are making to rise from the grovelling condition in which they have been held for so long. Raika's position as schoolmistress in a place like Panagurishti was by no means an unenviable one. A schoolmistress in a place like this is a different sort of personage, it should be remembered, from a schoolmistress in London. With her cleverness, her education, her good looks, the esteem and respect in which she was held by everybody, her position was a very pleasant one, and she was in reality a sort of village queen. I asked some of the people there if she had no sweet- heart all this time, and what had become of him. They said there seemed to be nobody who aspired to her hand, for the reason that she was so far superior to the young men of the place, that they did not dare to hope for such a prize as she would have been. Poor girl; not one of the young men who then thought her so far above them would marry her now. Things went on pleasantly enough until the breaking out of the insurrection in Bosnia and Herzegovina. Raika was eighteen, she had been a teacher for two years, and had nearly paid her debt. Then there were signs of approaching trouble. Fresh upon the news of the war in Herzegovina came the tax-gatherer with demands for the year's taxes and those of the previous year, which had been remitted owing to the failure of the crops. Many were unable to meet these

unlooked-for demands. Their property was instantly seized and sold at any price it would bring. The cattle, the agricultural implements of the peasants, were seized and sold without the slightest regard to future consequences. Some were even thrown into prison, when nobody offered, to buy the poor effects that were offered for sale. Naturally these acts resulted in a great deal of misery and dissatisfaction.

The taxes upon the agricultural population are heavy enough, often amounting, as they do, to twenty and thirty per cent., according to the tax farmer's capacity for extortion, without being suddenly doubled at a moment's notice. Hard upon this followed the demand for the taxes of 1876 in advance, which resulted in still more forced sales, extortions, quarrels with the tax-collectors, misery, and discontent. The young men of the place began to hold secret meetings and to talk of throwing off the yoke of the Turks, and asserting their independence, like their brothers of Bosnia, Herzegovina, Montenegro, and Servia. I may as well state here that it was in this place that the insurrection, if such a puny outbreak as occurred here may be dignified by that name, broke out. There was, it seems, an Insurrectional Committee at Bucharest, composed of young Bulgarians, in the schools or in business there. They were natives of the villages in this part of the country, and not Russians, as stated by the Turks as well as our diplomatists, who see a Russian in every bush. "The insurrection was fomented from without," in the sense only that these young Bulgarians had their head-quarters at Bucharest, and there does not seem to be the slightest evidence to show that there were any Russians or Servians in this part of the country, as is stated by the Turks, and believed by Sir Henry Elliot.

It does not appear that Raika had anything to do with fomenting the insurrection. She says that the first positive knowledge she had of anything brewing was in the spring, about Easter time. She was summoned one day to the house where the school committee were in the habit of meeting. She went, supposing it was for some business relating to the school, but was greatly surprised to find, not the school committee, but a number of young men of the village, who were listening to a fiery speech by a man named Bankovsky, urging them to revolt. We have not been able to find out who this Bankovsky was, nor what has become of him. It is supposed that he was killed near Sophia, but this is by no means certain. We have only been able to ascertain that his real name was not Bankovsky, and that he was a Bulgarian. I believe that many of the people know who he was and where he was from, but that they pretend to know little about him in order not to be forced to tell what they do know, and compromise his friends. Raika describes him as a tall, handsome man, with a blonde moustache, blue eyes, and a very fiery, eloquent manner of speaking. His words so worked upon them that they decided unanimously to rise as soon as Servia should declare war, which eventuality was looked upon as certain. They immediately commenced taking measures for carrying this resolution into effect, and it appeared that one of the first things they needed was a flag.

With a flag everything was possible, and this was why the young school-mistress had been summoned to the council. Her skill with the needle was famed throughout the country far and wide, and they had fixed upon her to embroider the standard of rebellion. Understanding the danger, she at first refused, and tried to dissuade them from their project, but they were resolved upon their line of action, and insisted upon her embroidering the flag for them. Urged partly by threats, partly by persuasion, and perhaps in the generous hope that the revolt might after all be successful, she finally consented; and it is sad to think that her skill in needlework, that most womanly of accomplishments, should have been the cause of so fearful a misfortune to her. In order to not compromise her father and mother, however, she decided to do the work in the house of one of the insurgents. A vain precaution. It did not prevent her father from being slaughtered, with hundreds of others, in the church where he was officiating. We have seen the flag as it fell into the hands of the Turks, and is now used in evidence on the trials that are going on here. The poor rag, bespattered and torn, was prettily worked with a naive design showing a huge yellow lion, with his paw on a crescent, with which he seemed greatly displeased, and the inscription, "Liberty or death," in Bulgarian.

By the first of May, the day fixed upon for the rising to take place, the banner was ready. But Servia had not declared war, and they had received almost certain information that they were betrayed to the Turkish authorities. They determined to go on, as they considered it now too late either to abandon the attempt or to postpone it. So having taken their arms, they formed in a body and marched to the church, sent for two priests, one of whom was Raika's father, declared their intention of rising, and asked them to bless the undertaking. This the priests did. Although several priests were killed at the time of the massacres, and several more hanged afterwards, it does not appear that any priest took a more active part in the insurrection than that of giving his blessing in one or two instances to the insurgents. Having obtained the blessing of the Church, the insurgents next called for Raika, and informed her that as she had made the flag she must carry it through the village at the head of a procession. She refused; but they seized her, put her upon a horse, put the flag in her hand, and marched through the streets shouting and singing in the most approved French manner. Having thus declared war, they proceeded to act. There was no *Mudir*, or Turkish governor, in the village at this time, so they had matters all to themselves, and nobody to interfere with them. They immediately proceeded to fortify the place, and they do not seem to have had any other plan for the insurrection than that of waiting quietly in the village,

and defending it against all comers.

This seems to have been the plan adopted in the three or four villages where a rising really took place; and a more foolish one could hardly have been imagined. Instead of young men in each village forming themselves into flying bands, and traversing the country in every direction, destroying the railways, cutting the telegraphs, surprising small posts of Turkish soldiers, and avoiding contact with large bodies of troops, each of these villages having thrown off the Turkish authority in the manner above described, adopted the mad plan of defending itself separately and singly against the regular troops. This, together with the fact that the rising only occurred in three or four places, and not simultaneously in these, would seem to indicate that the members of the Bucharest Committee were very raw hands at organizing an insurrection, and that their organization was very imperfect, if indeed there were anything like organization at all. They seem to have persuaded these three or four villages to rise, hoping that the rest of the country would follow the example, and that there would be a general insurrection as a matter of course. But the rest of the population, without leaders and without organization, remained inactive, and allowed themselves to be quietly slaughtered. There is little doubt, in my mind, that if the rising had been general, properly organized and provided with leaders, the Turks would have been obliged to abandon the whole country north of the Balkans, and withdraw to Adrianople. They would never have been able to fight Servia and Montenegro, and at the same time to keep up their communications through a hostile country that was up in arms against them. This is, in my mind, the best evidence that there was no organized insurrection throughout the country; for if there had been, it would have succeeded.

All the people of Panagurishti seem to have finally engaged in the revolt, for Raika informed me that even the women had gone out and worked on the fortifications, so great was the enthusiasm, and that they worked at them nine or ten days. I afterwards had occasion to inspect those amateur fortifications when I went there with Mr. Schuyler. They consisted simply of slight embankments thrown up across two of the roads leading to the village on hills between one and two miles away. The ditch was about a foot or eighteen inches deep, and five or six feet wide, and the embankment, or loose earth, three or four feet high, and not more than four or five feet wide at the bottom, would not have stopped a three-pound shell. It would have afforded convenient cover for pickets or a skirmish line, but was utterly useless for anything else. It would have been equally useless had it been a well-constructed fort; for the village was so accessible from all sides, that infantry would not be obliged to advance by the road, and the works would be turned.

The ten days during which they were throwing up this puny earthwork did not pass without some incidents. In the first place, two tax-collectors, who approached the place, were ordered to deliver up their arms, and upon their refusal to do so were fired upon and killed. These tax-collectors were not, properly speaking, officers of the Government, but rather agents of the tax farmer, who had excited the hatred of the people by their extortions. Shortly afterwards seven more Turks, who approached the village, were ordered to surrender, and did so at once. These were two zaptiehs, two tax-collectors, one clerk, and two pomaks or Mohammedan Bulgarians. They were all lodged in a Bulgarian house and well treated, except one of the zaptiehs or mounted police of the country, who had committed such acts of cruelty and barbarity that they decided he had merited death, and therefore sentenced and shot him. A day or two later some people in a closed carriage, approaching along the road towards the fortifications, were hailed and likewise ordered to surrender, and upon their attempting to escape were fired upon. The carriage was captured, and it was found there were two men and three women in it. The two men and one of the women had been killed by the fire; one of the remaining women seized a sabre and struck at one of the insurgents, whereupon she was killed. The other woman was captured and sent into the village, and well treated until the arrival of the Turks, when she was set at liberty. As far as we have been able to learn up to the present, those two women are the only ones that have been killed by the insurgents, and one of them, as I have just related, was shot accidentally. The Turkish authorities in Philippopolis state that there were twelve killed in all; but they have been unable to give Mr. Schuyler either the names of these women, or the names of the villages in which they were said to have been killed, and he therefore will not accept the statement until he finds further proof.

Kiani Pacha, who was sent here to inquire into the atrocities committed by the Bashi-Bazouks, told Mr. Schuyler, with the coolest assurance, that the wife and daughter of the Mudir of Avrat-alan had been killed. Mr. Schuyler found, upon investigation, that the wife of the Mudir had not been killed, and that he never had a daughter. It was said that the wife of the Mudir here in Otluk-kui had likewise been killed. As I have already stated, there was no Mudir in this village at the time of the outbreak, and his wife could not therefore have been killed. Of the twelve cases of Turkish women killed, we have therefore investigated five, and found that three of them were without the slightest foundation. As we cannot learn the names of the villages where the seven other women were killed, we cannot investigate, and we therefore take the liberty of doubting. The story told by Edib Effendi, of a Turkish girl who was killed and then mutilated in so disgusting a manner, is a pure fiction. We have not been able to discover the least trace of it. Nobody, Turk or Christian, in Tatar-Bazardjik, near where it is said to have occurred, ever heard of it; nor did the different Consuls in Philippopolis, who received

daily reports of every thing that was going on throughout the whole district from the beginning of the troubles, ever hear of it until they saw the report of Edib Effendi. The truth is that the story is an impudent falsehood, invented by Edib Effendi, which has not even the semblance of probability. This state of things continued in Panagurishti, or Otluk-kui, for nine or ten days, during which time nine Turks and two Turkish women were killed. All of these but the two women and the one zaptieh were killed with arms in their hands. Altogether during this time some twenty prisoners were taken, and these were well treated and cared for until the Turkish army came on and released them. It should be remembered that I am not giving the story of one person alone in making these statements, for since my conversation with the schoolmistress we have been to Panagurishti, have compared her story with the accounts received from other people, and find it corroborated in every particular. To tell the truth, it scarcely needed corroboration, for the Turks themselves, neither here nor at Philippopolis, do not claim more killed than the number above stated.

The rising occurred on the 2nd of May. On the 12th Hafiz Pacha arrived before the place with a regiment of regular troops, two or three pieces of artillery, and a great number of Bashi-Bazouks. It would seem that the insurgents only had about 250 men armed with muskets or rifles. The rest had only knives or pistols, such as before these troubles were worn by everybody. One hundred and fifty of the best armed men had gone out on one road towards Tatar-Bazardjik, to dispute the way, and 100 on the other road, for it seems they did not send spies out to see by which way the army would come. When Hafiz Pacha arrived he found only 100 men to oppose him, and these, frightened at the great superiority of the force brought against them, ran away at the first fire. It does not even appear that they fired off their guns, for there was not a single Turk killed or wounded. The inhabitants, panic-stricken, had in the meantime attempted to fly, but the town had already been surrounded, and they were either driven back or cut down in the fields. I had forgotten to state that at the approach of the Bashi-Bazouks the inhabitants of eight or nine neighbouring villages, fear-stricken, had abandoned their homes and taken refuge here, to the number of five or six thousand, and they now filled the streets, crying and screaming with fright. As all resistance had now ceased, or rather, as none had really been offered, Hafiz Pacha had nothing to do but march into the town, arrest the leaders of the insurrection, and restore order. Instead of this, however, he brought up his artillery, and, without summoning the place to surrender, commenced a bombardment, ruthlessly throwing the bursting shells into these crowds of shrieking women and children. Until midnight the din of the bombardment resounded through the streets. Then the loud-mouthed dogs of war ceased their clamour; they had done their work; it was now the turn of the sabre.

During the night and the next morning the troops and the Bashi-Bazouks entered the place, and then began a scene of pillage, violence, and massacre, only equalled by that of Batak. Neither age nor sex was spared. The town was pillaged, then fired; about one-fourth of the houses were burnt, people were cut down in the streets, on their own doorsteps, on their own hearthstones. Old men and women begging for mercy, and children and infants screaming in terror, perished alike beneath the swift and certain sabre. It is thought that 3,000 people were killed in this place alone, of whom about 400 were inhabitants of the town, and the rest from the neighbouring villages who had taken refuge here. But we were not greeted here with the scenes of horror that awaited us at Batak. Hafiz Pacha, unlike Achmet Aga, had sense enough to have the bodies buried within the following three days, and thus to cover up his tracks.

It has been repeated again and again that these acts were perpetrated by the Bashi-Bazouks only, and not by the regular troops; and a great deal is made of the statement as showing the massacres were committed without the consent of the authorities. If the statement were worth anything, the converse ought to be true—that if the massacres were committed by the regular troops then the authorities are responsible. Now, as it happens, wherever there were any regular troops to commit massacres, they rivalled the Bashi-Bazouks in atrocity. Here, as Mr. Schuyler will show in his report, regular and irregular troops were equally cruel, pitiless, and ferocious, and Hafiz Pacha is no less guilty than Achmet Aga. The reason is simple. They are all Turks alike, and there is nothing to choose between them. These massacres were committed by the order of the authorities, and that is why the men who committed them have been rewarded with decorations and promotions.

When we were in Panagurishti we were shown in the ruins of the church, before the place where the altar had stood, a black spot specked with calcined bones, on which lay a bouquet of flowers. This was the remains of a priest, Theodor Peoff, 85 years of age, who had been seized and tortured in the hopes of obtaining money, mutilated and maltreated in ways which only the foul imagination of a Turk could invent, then killed, and burnt here before the altar. In another place we were shown a black spot where an old blind man, Dondje Stregleyoff, was beaten half to death, and then thrown senseless on a heap of wood and burnt alive.

There was an old man here, Zwatko Boyadjieff by name, a public benefactor, a liberal contributor to the school fund, who in winter supported half the widows and orphans of the place, who was renowned for his charities to Christian and Turk alike. He was likewise seized, tortured, and maltreated. His eyes were put out, and, after undergoing the most fearful torments, he was thrown on a heap of wood fainting or dead, the people do not know which, and burnt. They seized the priest Nestor, and cut off his fingers one by one to extort

money, and as the poor man had none to give them they continued by cutting off his hands, and finally his head. We were shown in the yard of a neat little cottage, embowered in trees, a grave, beside which a woman was kneeling as we passed. It was the grave of a young man of eighteen, who had just returned home from school when the troubles began, after an absence of two years, and who had taken no part in the outbreak. They had seized him, and in mere sport cut off his hands one by one in the presence of his mother, then killed him.

What made these acts more terrible was, that many of them were committed in the presence of the weeping relatives—wife, mother, brothers, sisters of the victims. And they were repeated by the hundred. It would take a volume to tell all the stories that were related to us. But it was not only old and young men who suffered; women, young girls, children, infants, were ruthlessly slaughtered. These Turks have no pity, no compassion, no bowels. They have not even the pity of wild beasts. Even the tiger will not slay the young of its own species. But these Turks, these strong bearded men, picked infants up out of their cradles with their bayonets, tossed them in the air, caught them again, and flung them at the heads of the shrieking mothers. They carried little babes about the streets on the points of their bayonets, with the poor little heads and arms drooping around the barrels of their guns, and the blood streaming down over their hands. They cut off the heads of children, and compelled other children to carry the still bleeding heads about in their arms.

I would have the reader remember that I am relating facts that have been coldly and concisely noted down in my presence by Mr. Schuyler; facts that will appear in his report; facts that were told him by people who wept and moaned and wrung their hands, and fairly tore their hair at the bare remembrance of the scenes they were relating.

Hundreds of women came to us recounting what they had seen and what they had suffered. Not a woman in the place seemed to have escaped outrage. They all confessed it openly. In other places where these things occurred, the women have shown a hesitation to speak. In some cases they denied they had been outraged, and we afterwards learned they confessed to others that they had been. At Avrat-Alan a deputation of ladies called upon Mr. Schuyler to make their complaints, and he was somewhat astonished to find they had very little to say. Upon going away, however, they left him a letter, signed by them all, saying that scarcely a woman in the place had escaped outrage. They could not bring themselves to tell him *vivâ voce;* but thinking that as he was investigating here in an official capacity he ought to know, they had decided to write to him. Here, however, they did not hesitate to speak out. Outrages were committed so publicly, so generally, that they feel it would be useless to try to hide their shame, and they avow it openly. These acts were committed not only in the houses, but in the streets, in the yards, in the courts, for the Turks have not even the decency which may accompany vice. They have not even the modesty of vileness; they have not even the shame of nature. Mothers were outraged in the presence of their daughters; young girls in the presence of their mothers, of their sisters and brothers. One woman told us, wringing her hands and crying, that she and her daughter, a girl of fifteen, had been violated in the same room, another that she was violated in the presence of her children. A girl of eighteen avowed, shuddering and bowing her face in her hands, that she had been outraged by ten soldiers. A woman, who came to us on crutches with a bullet still in her ankle, said she had been violated by three soldiers while lying wounded on the ground groaning in agony. Young, delicate, fragile little creatures, ten and twelve years old, were treated in the same brutal manner. A woman told us that her daughter, a tender, delicate little thing of twelve, had been seized and outraged by a Bashi-Bazouk, although she had offered all the money she had in the world—although she offered herself—if he would spare the child. Another told us of a poor little thing of ten violated in her presence, with a number of other girls. Still another told us how a dozen young girls, twelve or fifteen years old, had taken refuge in her house, hoping to escape detection; how they had been discovered; how two of them had been outraged, and killed, because they had resisted, and how the others then submitted to their fate, white, shivering, their teeth chattering with fright.

And yet Sir Henry Elliot and Mr. Disraeli will keep prating to us about exaggeration, forsooth! The crimes that were committed here are beyond the reach of exaggeration. There were stories related to us that are maddening in their atrocity, that cause the heart to swell in a burst of impotent rage that can only find vent in pitying, useless tears. We were told of a young girl of sixteen, outraged by three or four Bashi-Bazouks in the presence of her father, who was old and blind. Suddenly she saw one of them preparing in mere sport to kill the poor old man, and she, sprang forward with a shriek, threw her arms around his neck, weeping, and trying to shield him with her own delicate body. It was all in vain; the bullet sped on its course, and the father and daughter—the sweet young girl and the blind old man—fell dead in each other's arms. I should, perhaps, beg pardon of my readers for dwelling on these harrowing details. But I am not writing for children and young girls, but for men and women; and everywhere here I see the Turks looking upon the English as their friends and allies, counting upon us for help against their enemies, looking to us for aid and comfort, and believing—most exasperating thing of all—that they have our approval in everything they do.

If I tell what I have seen and heard it is because I want the people of England to understand what these Turks are, and if we are to go on bolstering up this tottering despotism; if we are to go on carrying this

loathsome vice-stricken leper about on our shoulders, let us do it with open eyes and a knowledge of the facts; let us see the hideous thing we are carrying. Mr. Schuyler obtained ample evidence of other crimes too foul to be even named. I believe that Mr. Baring has obtained no information on this point, and does not believe in it. I scarcely wonder at this. There are crimes that repel investigation, that avoid the light; that, like those vile creeping loathsome things found under carrion or in the lowest depths of sewers, cling to the dark holes and corners and escape inspection. Mr. Schuyler has explored these dark depths to the bottom with the coolness of a surgeon probing a foul and festering ulcer. But I do not think he will be able to state the facts in his report. They are without the pale of the English language, and for my part I shall not again refer to them.

And the "Queen of the Bulgarians," the young school-mistress, what became of her? Alas! her fate was only that of hundreds of others. I could not ask her to relate all the story of her misfortunes. It was too plainly written in the pale, dejected, though still gentle and sympathetic face. But we saw a woman in Otluk-kui who was present when she fell into the hands of three or four Bashi-Bazouks. Yes, this educated, intelligent, sensitive young girl was seized and outraged, in the presence of half-a-dozen of her comrades and neighbours, by three or four brutes who still pollute the earth with their vile existence. Exaggerated, Sir Henry, indeed! And if your own daughter had been treated in the same way, would you still go on prating about exaggeration? But this was not enough. Her father was shot down in his own house, and she and her mother dug his grave in their garden and buried him; and still the poor girl had not suffered enough. The Turkish authorities heard that she had embroidered the flag, and two weeks after the insurrection was completely crushed they ordered her arrest. A Mudir had been sent to the village in the meantime, and he seized and took her to his house at ten o'clock at night, with the woman at whose house the flag had been worked—the tall, stalwart woman of whom I have spoken in the beginning of this letter. She told us what occurred in the Mudir's house that night. The poor girl, in spite of tears and prayers, that might have moved a tiger to pity, was stripped naked, beaten, spat upon, and again outraged. It was then that she was nick-named "Queen of the Bulgarians," and the next day she and another woman, who had been likewise maltreated in even a more horrible way, were sent to Tatar-Bazardjik. Here she was surrounded by the Turkish population, hooted, jeered, pelted with mud, spat upon, and insulted with the foulest epithets that a Turkish mob could find. It mattered not that she was one poor weeping girl all alone among a crowd of enemies—fiends rather than men. There is no pity in the breasts of these savages. Then, fainting, insensible, she was thrown into a cart and sent off to Philippopolis, thrown into prison there, and kept on bread and water until the arrival of Mr. Schuyler. Then she was set at liberty, ill, shattered in health, and brokenhearted.

We saw this same Mudir of Otluk-kui when we were there. Mr. Baring spoke of him as the most filthy brute he ever saw. The very night Mr. Baring was there, the Mudir, as if in very contempt for his presence in the place, sent for two young married women, whose husbands had been killed in the massacre, to come to his house. They refused. The next night, when Mr. Schuyler was there, he again sent for them, and they again refused; but they came to Mr. Schuyler next day in despair, saying they felt sure that as soon as we left the village he would send his zaptiehs for them. When Mr. Schuyler spoke to the Governor of Philippopolis about this Mudir, he simply replied that he knew he was a bad man, but he had no better man to put in his place. This man will not be punished, nor will Achmet Aga, the destroyer of Batak, nor another Achmet Aga, equally infamous, who destroyed Perustitza; nor Tossum Bey, who burnt Klissura; nor Chefket Pacha, who, beaten as a general in Bosnia and Herzegovina, wreaked his vengeance on the unresisting people of Bazardjik, where his generalship had full scope. These men have, on the contrary, been rewarded, decorated, and promoted. And we can do nothing; I am sure nothing will be done. Diplomacy is impotent. If Sir Henry Elliot remains in Constantinople he will make a few mild representations to the Porte, which the latter will receive with the best possible grace, and—that is all. How could it be otherwise? Sir Henry does not believe in the atrocities. How can he be expected to make strong representations on the subject? Or a strong man may be sent in Sir Henry's place, who will go so far as to make urgent representations to the Porte, or who may even go the length of making strong representations. The Porte will promise everything. It will give assurance of the most benevolent intentions, it will utter the most philanthropic protestations, the Government will issue more paper reforms, the diplomatists will be satisfied, and that will be the end of it.

It cannot be otherwise. There are not a dozen Turks in the empire who see the necessity of reform. There is nobody to carry out the reforms. The Mutlé-serif of Philippopolis told the simple truth when he said he had no better Mudir to send to Otluk-kui instead of the drunken beast who is there now. But they would not carry out reforms if they could. The Mutlé-serif of Philippopolis has the reputation of being too favourable to the Bulgarians, and when we were there the Turks were loudly demanding his recall. He seemed like a very honest, conscientious man, desirous of doing what was right. He entered into the question of the misery of the burnt-out people with Mr. Schuyler and Mr. Baring in an earnest serious way, that carried with it the conviction that he was really working hard to relieve their sufferings. He said money was to be given them, their cattle to be restored, their houses rebuilt, and every possible thing done for them. He was so earnest, so serious, so

thoroughly convinced of the necessity of these measures, that you could not doubt his good intentions. And yet, not only are the cattle not restored, not only are the houses not rebuilt, but Mr. Schuyler has found that this same plausible, earnest, conscientious governor, at the very moment that he was making these promises to him and Mr. Baring, was issuing the strict orders that the people of Batak, as well as of the other burnt villages, be forced to pay their regular taxes as though nothing had happened. And this is one of the good men—one who is so friendly to the Bulgarians that the Turks demand his recall.

Here is an example of Turkish ideas of reform. Until the last year the whole male Christian population, from infants one day old up to the age of a hundred, had to pay the military exemption tax. Last year, however, a great reform was ushered in with a loud flourish of trumpets. In future, only those capable of military service were to pay the exemption tax, and there were great rejoicings among the people. But when the tax came to be levied, what was the astonishment of everybody to find that each village was ordered to pay exactly the same sum as before. The tax was only redistributed. The round sum before paid on the whole population of the village now falls on the shoulders of those only capable of military duty. But the whole amount must be made up. This is the Turkish idea of reform, and the Turkish way of throwing dust in the eyes of Europe. And these are the people from whom we expect reforms! There will be no reforms. The thousands of helpless women and children, of babes and sucklings slaughtered in cold blood, whose bones and flesh are fattening the soil of Bulgaria, cry out against the hollow mockery, and give it the lie. And you say, oh statesmen of Europe, that the *status quo* must be maintained; that this must last. I tell you it will not last. You must find another solution for the Eastern question, or another solution will find you. It will not last, or civilization is a delusion, justice a mockery, and Christianity a farce and a failure.

The following letter reached the *Daily News* office without date.

PHILIPPOPOLIS.

A two hours' drive from Philippopolis over a very fair road that led through the rich and fertile valley of the Maritza, brought us to what had formerly been the village of Perustitza. This village was attacked and burnt by the Bashi-Bazouks, led by one Achmet-Aga, who must not be confounded with another Achmet-Aga, still more infamous, who destroyed Batak. It was a prettily-situated little place, built, as it was, on a low hill that dominated the valley of the Maritza, and enabled its inhabitants to command a view over the rich and luxuriant valley, miles in extent. It was, however, like so many other places that we have seen, in ruins, not one house remaining standing. We found about a thousand people, of whom the greater part were women and children, who were living in the nooks and corners of the walls, where they had constructed temporary sheds of straw capable of sheltering them from the sun, but not from the rain. Their present means of existence were principally the new harvest, which they were gathering slowly and painfully, without the aid of their cattle, which had been driven off by their Turkish neighbours, and partly some assistance that was given them by the Governor of Philippopolis. This is the only case we have heard of where the Turkish authorities have given any assistance whatever to the burnt villages. The cattle of the people here were all in the village of Ustuna, not more than three miles distant. They had been there in the possession of the Turks ever since the middle of May. Not a single head had been restored to the owners, and yet the kind, plausible, earnest, conscientious Mutlé-Serif of Philippopolis, with whom we were to dine that night, had assured us only the day before that the cattle had been restored to their proper owners, that the houses were being rebuilt, and help distributed to the needy.

Nobody can understand the cool, plausible, conscientious way in which a Turk can lie until he has seen what I have seen during this trip through Bulgaria. I have travelled a good deal, and seen something of the world; but I am willing to confess that until I came here I had no idea of the extent to which human duplicity could be carried. The honest, straight-forward way in which these people will lie to you is simply past belief, and will impose upon the most incredulous and sceptical mind. There is an honesty, an earnestness, a seriousness in the tones of the voice, an evident knowledge of the necessities of the situation, which carries conviction with it, and convinces you that they see and know and feel about it exactly as you do. The right is so evident to their mind as well as yours, that it is impossible they should go wrong; and it is not until you see with your own eyes that they have been coolly, deliberately, and with premeditation, lying to you in the most shameless manner, that you begin to fathom the depths of their duplicity. There are cases like the present, in which one finds out the truth; but generally you have no means of verifying what has been said to you, and of necessity you are obliged to believe. It requires a special habit and training of mind to be able to disbelieve every word which is said to you; a habit of mind which Europeans as a rule have not got, which they cannot get, unless brought up in it from infancy, and which is rarely obtained in Europe. This is why Europeans are continually deceived and overreached in their dealings with Orientals. The reader will say, perhaps, that I, the writer of these lines, seem to have learnt it pretty well already. Not at all. I know that the Mutlé-Serif of Philippopolis, or any other Turk, can make me believe any number of lies, unless I have ready to hand the means of disproving them. I feel I am a perfect child in their hands. I could no more have doubted Kiana Pacha

and Edib Effendi when they said there was nobody killed at Batak than I could have doubted that the sun would rise to-morrow, had I not been to Batak and seen 6,000 or 7,000 bodies lying there. So far from returning the cattle to the destitute villagers, the Turks of Ustuna, hearing that we had been to Perustitza, and fearing we might make urgent representations on the subject, drove them all off to another part of the country, and sold them.

The troubles seem to have arisen here as follows; and I will only preface the relation of what occurred with the remark that the same atrocities and, horrors, the same scenes of pillage, violence, and massacre occurred here as elsewhere. If I do not dwell upon them more in detail it is because I think I have already given the reader a sufficiently clear idea of what the pillage of a village and the massacre of its inhabitants really means, and it is useless to go on repeating these harrowing stories to infinitude. Perustitza was a place of 350 houses and from 2,000 to 2,500 inhabitants. It was nearly the only village where any real resistance was offered, the Bashi-Bazouks, and the people here defended themselves with far more vigour unprepared as they were, than did the inhabitants of Otluk-kui, who had gone to the trouble of making fortifications. But, in spite of the assertions of the Turks, I do not think that Mr. Schuyler has obtained any evidence to show that there was anything like a real insurrection here. All that can be made of the mass of conflicting evidence is that the country was in a state of great agitation and excitement owing to the circulation of rumours about the intended declaration of war by Servia; that the Christians and Mussulmans were about equally afraid of each other, and that the former especially were in a state of panic, only too well justified by subsequent events. The inhabitants of Perustitza deny that there was any insurgent committee in the village, or that any insurrection was organized here. The only proof the Turks offer of the contrary, was that many of the people had buried their valuable effects early in the spring, and had planted their crops over them so as to effectually hide them, thus giving evidence that they knew an insurrection was preparing weeks before it actually broke out. This is simply no proof at all. These Bulgarians are so accustomed to lawless acts of violence, to spoliation and robbery by Turkish officials, as by thieves and brigands, that they always keep whatever little money they may have put by buried in the ground, and upon the slightest alarm they bury everything valuable that they have no immediate use for and that will not spoil by being put in the earth. This fact is rather an evidence of Turkish misrule than of anything else, and only shows the general state of insecurity in which people Jive here. The people who live north of the Balkans, and who cross the mountains every year, and go south to help to get in the harvest, always bury their valuables before starting; and when the war broke out last year in Bosnia and Herzegovina, the whole population of Bulgaria buried their money, jewels, and other valuables immediately, to be ready for the worst. A custom which is really an evidence of Turkish misrule, and nothing more, is impudently offered by the Turks as an exceptional thing, and as evidence of a regularly organized revolt.

The people assert, and I have no reason to doubt their word, that until they heard of the massacres in other places, and saw from the hills above the town, the fires of other burning villages, there was no thought of insurrection or even of defence. When however, they saw these sinister tokens they immediately sent one of their head men to Philippopolis to the Governor, Aziz Pacha, to ask that some regular troops might be sent to protect them. To the first application they received no answer; and the next day they sent the same man back again to demand protection. This is not denied even by the Turks. The only difference in the story as told by the Turks and Bulgarians is, that the former say that Aziz Pacha promised them protection, while the Bulgarians assert, in the most emphatic manner, that he wrote them a letter which was read to all the men of the village assembled together, telling them that he had no troops to send them, and that if they were attacked they must defend themselves. But he advised them to remain quietly at home, not leave the village for a few days, and allow nobody from any other village to come there. They all maintain so stoutly that such a letter was written them by Aziz Pacha that I cannot doubt it. We could not find the letter, because the man who had brought it—the same who had gone to ask for protection—had been arrested upon returning to Philippopolis a third time upon the same mission, and thrown into prison. He told us one of the head men of the place had possession of the letter when arrested, and the Turks had of course seized it. In the meantime, between the second and third appeals for help, Aziz Pacha sent two zaptiehs, or rural policemen. These zaptiehs, however, only remained a few hours, at the end of which time they said they would go to Ustuna and see what was going on there, borrowed two horses, went off, and never came back. Then there arrived two Bashi-Bazouks, with a message from Achmet-Aga, the chief of the Bashi-Bazouks, saying he was coming with 200 or 300 Bashi-Bazouks to protect them, as he had heard they had asked for protection. They, however, did not relish the protection of the Bashi-Bazouks, and told the two emissaries that they did not want to be protected, and that they were going to protect themselves. The two Bashi-Bazouks insisted, however, that Achmet-Aga should come and protect them and refused to take back the message. Whereupon there was an altercation, in the course of which the two Turks were seized and killed. These facts were related to me by an Armenian woman, whose husband kept a kind of *café* in the place, and in whose house the interview with the Turks took place. The Armenians and Jews, I may remark, are the only people here who may be considered really impartial, as they are neither Turk nor

Bulgarian in language or religion, and both parties treat them as friends. She said there was evidently no ill-feeling towards the two Turks when they arrived, as the Bulgarians had given them coffee in her house As Mr. Baring talked to this woman, I presume he will have obtained the facts from her very much as I give them.

There was not, so far as we can learn, any sufficient reason for killing these two Turks. It is true that they were Bashi-Bazouks, and that several villages had already been burnt by the Bashi-Bazouks, that they had come with what could only be regarded as a threatening message, but this was no excuse for killing them. It has been impossible to learn under exactly what circumstances they were killed, as it was not done in the village, and we do not know whether it occurred in a fight, or whether it was done in cold blood. What seems probable, however, is that they were asked to deliver up their arms, that they refused, and that they were then fired upon and killed. The villagers appeared to think they were simply carrying out the instructions of Aziz Pacha, who told them to allow nobody to come to their village; for it was after killing these two Bashi-Bazouks that they sent the third message to him asking for his protection, and informing him what they had done. But the Turks say that the messenger only delivered a part of the message, and said nothing about the killing of the two Bashi-Bazouks, and this is why he was arrested a day or two later, when the truth was known, for he had remained in Philippopolis and never returned to the village. Be that as it may, there is no doubt that the villagers sent the message, for they made no secret of killing the two Bashi-Bazouks, and do not now. In the meantime the villagers, having received no answer to their third appeal for protection, and justly fearing the vengeance of the Bashi-Bazouks, of whose ravages in other villages they were receiving daily reports, began to prepare for defence. Some of them, however, decided to fly to Philippopolis and the other villages, and did so, leaving all their property behind. The rest determined to defend themselves to the last. They collected provisions for several days in one of the churches on a little eminence overlooking the town, a place very well suited for defence, as it was in a commanding position and surrounded by a good heavy stone wall. They made loopholes in this wall, put several barrels of water in the church, and made ready for a siege. It will be observed that they never went out of their own village, nor made the slightest attempt to molest their Mussulman neighbours. Finally, on Tuesday morning, the 29th of April (old style), corresponding to our May 11th, the day before the massacre of Batak, the Bashi-Bazouks were reported to be coming from the direction of Ustuna. Every-body—women and children as well as men—immediately abandoned their houses and took refuge in the church. But some, whose courage failed them at the last moment, determined to go out and surrender. They did so, and after having given up their arms, were massacred. This did not, however, entourage the others to follow their example, and they resolved all the more sternly to resist to the last.

Among those who went out of the village at this time was a Frenchman, engaged in some commercial enterprise in Philippopolis, who, hearing of the troubles, had come home the day before in search of another Frenchman, a comrade who had been absent some days, and to whom he was afraid something had happened. He went with a number of the villagers to meet the Bashi-Bazouks, was received by Achmet-Aga, to whom he explained his business, as he spoke Turkish very well, at the same time telling him he was a Frenchman. There was in fact no need of an explanation, as he was well known all over the country. He was retained a prisoner for a while, and then killed, probably because they thought he had money about him. The comrade he was in search of had been already seized and killed before. The French Consul, having established the facts, has made a complaint, and the French Government has probably by this time made a demand for the payment of an indemnity to the families of the two men. This is an important fact bearing upon the affair of Perustitza, which cannot be overlooked, for it shows the murderous spirit which actuated the Bashi-Bazouks. Many of the people who had not sufficient confidence in the goodness of the Turks to go and surrender, and who nevertheless were not disposed to take their chances in the church, fled to the fields, and were pursued by the Bashi-Bazouks and killed wherever overtaken. Having thus terminated their connection with the people who fell into their hands, they proceeded to pillage the abandoned houses, to which they afterwards applied the match. They did not make any direct attack upon the church, further than firing upon it from a safe distance. They were brave enough when it was a question of fighting women and children, but as soon as they found armed men before them they were by no means so anxious to try their sabres.

During Tuesday, Wednesday, and Thursday they amused and enriched themselves by pillaging and burning the villages, occasionally firing at the people in the church at long range, while the poor villagers remained in the churchyard all this time and watched their burning houses with despairing eyes. They could do nothing. There does not seem to have been more than two hundred of them armed, while the Bashi-Bazouks numbered a thousand. I have talked with an Armenian girl, the daughter of the woman above referred to, who remained in the church throughout the siege. The story she tells is a most curious and interesting one. Her father and mother being Armenians thought they could risk leaving the village, and went to meet the Bashi-Bazouks with the others who went out to surrender. Their nationality and their poverty saved them, for they were not harmed. But they had not chosen to take their daughter with them, because, as she said, they feared she would be outraged if she fell into the hands of the Bashi-Bazouks, and they preferred to leave her behind with the people in the

church, to take her chance of life and death in the impending fight. She says the women and children were all put in the church, which was as full as it would hold, and that the men remained outside the churchyard, sheltered behind the wall, watching the movements of the enemy, and occasionally firing through the loopholes when the occasion offered. She said the men showed themselves very cool and brave at this time, and did not seem to be in the least afraid of being able to make good their defence against the Bashi-Bazouks. There was nobody in particular who seemed to command them, or who appeared to direct the operations, but they gave out rations, posted sentries at night, and kept up a very bold front from Tuesday until Thursday. She relates a most curious fact with regard to the girls of the village. It was decided as soon as the people had assembled in the church, that all the girls over ten should be dressed in boys' clothes, so that in case the worst came to the worst they might have a better chance of escaping the brutality of the Bashi-Bazouks. Nearly all the young girls put on a suit of their brothers' clothing, cut off their long hair, and did their best to make-up as boys. She says they offered her a suit, but she was ashamed to put it on, and had gone through the siege in her own apparel. She says that these girls showed themselves very brave, and that many of them would have been glad to handle a gun had there been any for them. But even the men were not all armed, and there were, of course, no weapons to spare for the women.

The reader will have much satisfaction in learning that such of these brave girls as escaped death during the siege likewise escaped outrage. Many of them were killed, as wherever they showed themselves they were taken for men and ruthlessly fired upon, but those who remained alive escaped dishonour, and among the crowd of three or four hundred people who gathered around us when we arrived in the village I saw many a bright pair of eyes that met our gaze as proudly and saucily as ever, in spite of the missing tresses. Many women were outraged here as elsewhere, but they were principally those who had given themselves up in the beginning, or had tried to escape into the fields on the approach of the Bashi-Bazouks. The Armenian girl describes the nights passed in the church here as something fearful. The continued alarm, the apprehensions of a night attack, the crying of children, the weeping and mourning of the women watching their burning homes and dreading what was yet to come, the firing and shouting, the crackling flames that lit up the night and rolled off great volumes of smoke which hung over them, and threw back the glare from on high, so that the people in the church could see to read their prayers, made up a scene of terror which, told in the energetic, interjectional, excited language of this peasant girl, was full of a thrilling interest. They were so closely packed that it was impossible for them to lie down, and those who slept did so sitting or standing. Indeed there was little inclination to sleep except among the children, the excitement and terror were too great. This continued until Thursday afternoon. Then there came a change; Achmet-Aga, who commanded the Bashi-Bazouks, had sent to Philippopolis to say that the village had risen in revolt, and that he was attacking it. These people would not come quietly out, deliver up their arms and be slaughtered as they had done at Batak. They were therefore insurgents, and must be dealt with accordingly. The fact is that this was a revolt of the Bashi-Bazouks, and not of the Christians, and in any other country in the world but Turkey it would have been regarded as such. Aziz Pacha, who was so friendly to the Bulgarians that he has since been removed, and who had paid no heed to the repeated demands of the people for protection, now that they were attacked as they had foreseen they would he, instead of going to protect them, marched against them at the head of regular troops and a battery of artillery.

He arrived at the village on Thursday afternoon, and without summoning the place to surrender, opened a bombardment. The first intimation the people had of his presence was the roar of his cannon. I know the Turks assert that he sent a summons to them to surrender before opening fire. This, however, the villagers deny stoutly; and as the Turks themselves admit that the village had sent to Aziz Pacha three times demanding his protection, it does not seem probable; it is altogether past belief to suppose that they would have refused to surrender when he arrived at the head of regular troops. I know that Mr. Guarracino tried hard to get evidence to show that Aziz Pacha sent them a summons to surrender, and to show that they refused. I am convinced that he will have obtained no trustworthy evidence to confirm these assertions, because the facts that are acknowledged by the Turks themselves are against it. These facts are—first, that as soon as the artillery opened upon them the men, who up to that time had maintained a bold front, became panic-stricken and did not offer afterwards the slightest resistance. They immediately abandoned this church, which they had stored with provisions and prepared for defence, which was in an excellent position for defence, and all—men, women, and children—fled.

This one would think sufficient evidence for Mr. Guarracino that there was no resistance offered to the regular troops; but he tried hard to obtain proof that they resisted even after this. They took refuge in another church which was down in a little hollow on the other side of the village. No defence was possible in this church. We all went together—for it happened that Mr. Baring and Mr. Schuyler went to Perustitza the same day—and examined this church; indeed, the investigation was carried on for the most part in the churchyard. It was dominated on all sides by the rising ground around it at easy musket range. The churchyard was surrounded by a wall ten feet high, which indeed offered a shelter, but over which it was impossible for

anybody inside to fire. No loopholes had been made in this wall; no scaffolding had been erected inside to enable the people to fire over it. The church was equally incapable of defence. There were only two windows from which shots might have been fired. These were two round windows high up on the gable ends of the building, which was like all the Bulgarian churches, very low, with the floor sunk below the ground. We could not learn that any scaffolding had been constructed up to these windows to enable people to fire from them. It does not appear that there was a single shot fired from this church. The very fact that the people left a place like the other, capable of defence, and came and took refuge in a slaughter-pen like this,; is sufficient evidence to show that they had abandoned the idea of resistance. Mr. Guarracino did not think so. He tried to get the people to say that Aziz Pacha had sent them a summons to surrender; that they had fired on the bearer of the summons, and continued the fight; and when they refused to admit this, he bullied and browbeat them, called them insurgents, and told them they had brought it on themselves. In addition to this, there was the evidence of the Armenian girl, who said that the majority of the men escaped over the walls the next night after coming here, and fled into the country, leaving only about fifty or sixty men in the place, with the women and children—very good proof that no defence was intended against the regular troops, and none really offered.

Now, what did Aziz Pacha do when the people fled here for shelter from his artillery? There is no evidence to show that he sent them a summons to surrender even then, for if he had done so they would have surrendered. He simply changed the position of his artillery, and on Friday morning opened upon this church as he had done on the other. When we were there the ground of the churchyard was ploughed up with shells, and there were marks where the shells had struck all over the walls of the church. The Armenian girl said that here, as before, the women and children were put in the church, and that it was packed so full that they could not lie down nor even sit. She said that three shells came into the church through the round windows in the gable ends and exploded among this packed mass of women and children. We ourselves saw the marks of two shells within a foot of one of these windows, showing that it had been the target aimed at. The people of the village said that five had come in, two at one end and three at the other. It may be that this girl was fainting when the two others came in, and that she did not know it, or it may be that only three really came in. But three are enough. Those who have seen it know the effect of a shell exploding in the open air among armed, stern-faced men, who, carried away by the excitement of battle, scarcely heed it. But the effect of a shell coming in through one of these high gable windows, with its terrific thunder, and exploding among this mass of shrieking women and children—there were only women and children in the church—is beyond the power of imagination to conceive.

It is difficult to find out how the siege ended, or to get anything like a clear account of what took place on Saturday morning. The villagers say that all day Friday the Turks were around the place, and that everybody who showed himself at the gate was immediately cut down by the Bashi-Bazouks, who were waiting and watching outside, without daring to enter—for they are not brave, these Bashi-Bazouks. They do not care to attack people until they have, by fair promises, obtained their arms, and they simply stayed outside and waited for the people to come out one by one. On Saturday morning, however, it seems they were withdrawn, and replaced by regular troops.

The Armenian girl says that on Saturday morning she looked out of the church and saw the gate of the churchyard slightly open, with a soldier standing before it. She immediately ran out to him and begged him not to kill her. He told her not to be afraid, and to call to the others to come out, and that they would not be harmed. This she did, and they all followed her out, altogether about two hundred and fifty or three hundred people, principally women and children. They were conducted before Aziz Pacha, who was really only waiting to receive them with open arms. He praised the Armenian girl for having taken the lead and induced the others to follow, and he told them it was all their own perversity that they had not come out and surrendered sooner. He had only been waiting for this step on their part to raise the siege and stop the bombardment. He was astonished at the stubbornness of these women and children, who would insist upon being bombarded and shelled in this way, when all they had to do was to come out and throw themselves upon his merey. Really, the perversity of some people is beyond all calculation. It does not appear that anybody was killed after this surrender, and the Armenian girl says that none of the women who surrendered at this time were maltreated or violated. This is probably the reason why the Turks demanded the removal of Aziz Pacha, as being too friendly to the Bulgarians, and made such efforts against him that they finally obtained his recall. As to the number of people killed here it is very difficult to form an estimate. There are no trustworthy census statistics. Each village makes up its own returns; they always understate the population, the number of houses, and families, in order to avoid increasing taxes, so that it is almost impossible to ascertain the exact population of any place before the massacres. The returns for this village, as I have already stated, showed the number of houses to have been three hundred and fifty, which at the very moderate calculation of six to the house would give a population of over two thousand. It would probably be found to have been somewhere between that and twenty-five hundred. The people estimate the number of those remaining at one thousand, which would show that between one

thousand and fifteen hundred people had been killed here. Mr. Baring and Mr. Schuyler both, I believe, put it at a thousand.

BUCHAREST, *August* 22.

I have just arrived here after a few weeks' trip through Bulgaria, in company a part of the time with Mr. Schuyler, whom I left pursuing his investigations in the Balkans. Before continuing the recital of what we saw and heard, I wish to exchange a few remarks with Mr. Disraeli on the subject of "exaggerations;" to offer a few observations on the conduct of Sir Henry Elliot, and to give a short account of the present condition of the country.

I see that in Mr. Disraeli's last speech he still reiterates his assertion, that the accounts of these atrocities here have been grossly exaggerated, because Mr. Baring had not found any evidence that human heads had been carted through the streets of Philippopolis, nor any to show that forty young girls had been burnt alive at Novi-Selo. With regard to the first point, it strikes me as somewhat immaterial whether the heads were carted through the streets or not, once you admit, as Mr. Baring does, that the people who owned them had been killed. But at the time that Mr. Baring sent that telegram which Mr. Disraeli read with such a triumphant air, he had not yet been to Tamboli. Had he been, and had he talked to the Italian Consul at Burgas, who has a commercial establishment at Tamboli, he would probably not have sent that telegram. For the Italian Consul would have told him, and probably has told him ere this, that sackfulls of heads were emptied in the street before his door. There was a steep descent there, leading down to the little river that runs through the town, and the heads rolled down this little bill, tumbling over each other in horrid confusion, as though trying to escape from the dogs that immediately pounced upon them. Exaggeration, indeed, Mr. Disraeli! It is very true that forty young girls were not burnt alive at Novi-Selo. This occurred at Batak, and there were not 40, but 200 girls, women, and children burnt alive.

The people who appear to be principally to blame in this business, are the newspaper correspondents. The great crime in the eyes of Mr. Disraeli and Sir Henry Elliot was not to have killed many thousands of innocent people, but to have said there were 30,000 killed when there were only 25,000. The grievous fault was not the slaughter of a thousand little children, but to have written there were a thousand killed, when in reality there were only nine hundred and ninety-nine. It was not much matter to have cut off the heads of a great many people; but to have said that these heads were carried through the streets of Philippopolis, when, in reality, they were carried in bags and rolled down a street before the house of the Italian Consul in a very different place, is a kind of crime that Mr Disraeli and Sir Henry Elliot cannot easily forgive.

It was on Friday that these shells were thrown, after the greater part of the men had run away. Many of these men who escaped on Thursday night were caught next day in the country and killed. The people still left in the church and churchyard were in despair. There were less than a hundred men, and there were four or five hundred women and children. They had already sent three or four old men and women to Aziz Pacha to ask for peace, and these had never returned. They had probably been killed by the Bashi-Bazouks before reaching the Pacha, for I am willing to give him the credit, if any credit there be in the supposition, that these messengers never reached him. It is enough that he should, after these people had appealed to him three times for protection, without asking them to submit, without waiting to hear what they had to say in their defence, have bombarded the place and shelled this churchful of women and children. It is enough that he should have done this, that he should have gone on shelling these miserable beings after they had fled to this slaughter-pen and ceased the slightest effort at resistance, and it is scarcely worth our while to try to prove, as we might do, that he did refuse to listen, or would have refused to listen, to any prayers for mercy that might have reached him through the lines of Bashi-Bazouks. Mr. Guarracino made a great point of this fact, and he and his Turkish *protégés* are welcome to all the credit that may be derived from it. They take to themselves as much praise for the fact that these messengers never arrived as though they had never been sent, and as though the Turkish commander were not directly responsible for their non-arrival. We shall see presently how he protected the messengers who did reach him.

But the poor people determined to make one more effort to obtain a cessation of the firing before completely abandoning themselves to despair, and two of the richest women of the village volunteered to go and try to reach the Turkish general. The Armenian girl tells how they tried to arrange their dresses to look their best, and how they put on whatever poor articles of jewellery they had about them in order to look as rich and imposing as possible. The poor women actually hoped to overawe the Bashi-Bazouks by their magnificence. Perhaps their calculations were not altogether wrong, for they really succeeded in reaching the Turkish general. He instantly promised them that if the people would come out of the church and surrender they should not be harmed, and he sent back an old man who had been made prisoner to accompany them. But he does not seem to have given them a guard or escort of any kind. On the way back the two women were seized by the Bashi-Bazouks, stripped of their jewels and clothing, violated, and then killed. The old man continued his way, and delivered his message; but as he at the same time told them what had happened to the two women, the

people in the church did not feel encouraged to come out, and they remained there all Friday night. Aziz Pacha threw several more shells at the church; the Bashi-Bazouks from the surrounding slopes kept up a fire of small arms, to which no answer was made. The condition of the people in the church was now fearful in the extreme. They had been besieged for four days. The dead bodies of those who had been killed were still lying around them unburied; the wounded were groaning in the agony of undressed or improperly dressed wounds, for there was of course no doctor among them, and they were all besmeared with blood of their own or their slaughtered companions that had clotted and grown hard, and they were filthy, loathsome, and haggard as spectres. And still the small arms of the Bashi-Bazouks played upon the church from the low hills around, and the shells continued ploughing up the churchyard, or crashing against the walls.

The story of the Armenian girl regarding the events of Friday and Saturday is strangely incoherent and wild, and what she relates is simply incredible. I can only account for this part of her story on the supposition that she had by this time gone partially or quite mad. She relates that on Friday after the murder of the two women above related, the men remaining in the churchyard determined, upon the failure of this last attempt at negotiation, to kill themselves. She says that some of them were on the point of putting this resolution into effect when their wives interposed and begged to be killed likewise, whereupon ensued a scene of horror that we might well believe the coinage of this girl's own mad brain were a part of the story not corroborated by all the villagers. It seems that two of these men actually carried their resolution into effect. Two of them, after weeping, moaning, tearing their hair, beating their heads against the wall, actually killed their wives and children, and then killed themselves. This girl relates that these women asked to be killed, that they knelt down, gathered their little ones to their arms, weeping, sobbing, praying, while the husband and father shot or stabbed them one after the other. The girl's story with regard to these two is corroborated by the rest of the villagers, but she goes much further. She asserted, and persisted in the assertion, throughout a series of sharp cross-questions, that there were many more who killed themselves, or who were killed in this way; that fifty or sixty men killed their wives and children; that many young girls and married women, whose husbands had been killed or who had escaped on Thursday night, came forward and asked to be killed likewise, to avoid falling into the hands of the Bashi-Bazouks; and that their request was complied with. She thinks there were fully two hundred people killed in this way. She says that they even asked her if she wished to be killed likewise, and that she declined.

The story is so thoroughly in keeping with the sad despondent character of the Sclaves that I should be inclined to believe it, were it not that it lacks confirmation. The truth seems to be that there were only these two, one of whom had two children, and the other, three. I can only account for this girl's story on the supposition that after four nights passed in this manner, nearly without sleep, surrounded by horrors, she had gone quite mad, and was subject to hallucinations. Awaking probably from a fainting fit, or a long state of insensibility, she beheld these two men, her near neighbours, killing their wives and little ones. She looked about her and saw the ground strewed with dead bodies lying in their blood. She says the floor of the church was ankle deep with blood, and she instantly jumped to the conclusion that all these people had been killed in the same way. But two are enough. That even two men should have decided to kill their wives and little ones, to plunge a knife, to fire a bullet, into the weak tender little beings that looked to them for love and protection, shows to what a state of despair the people were reduced by the senseless conduct of the Turkish commander. And Mr. Guarracino insisted that this all happened to them because they refused to surrender! The perversity of these people was such that he could not account for it. The Armenian girl says that at one time she wanted to be killed, and tried to go where the bullets could reach her, but the other women held her back. There was no romance about this girl. She was a mere peasant girl, with a dull, heavy, phlegmatic face, that was as far removed from the poetic and romantic as it is possible to imagine. I should have thought that nothing short of physical torture would have driven her to think of death as a relief.

Sir Henry Elliot is greatly to blame for his conduct throughout this whole business. His system of dealing with the Turks has been from the beginning radically foolish and wrong, considered even from his own point of view. If the English Ambassador at Constantinople is to be the friend and champion of the Turk, he should, one would think, give friendly advice, reprove, restrain, reprimand, and prevent the Sublime Porte from committing sublime acts of folly. It is only in this way that the Turkish power can be maintained for even a short time longer in Europe. Sir Henry's policy has been diametrically opposed to this. He has always acted upon the absurd principle that, as Turkey is a free and independent Power, the Turkish Government must never be interfered with or restrained, no matter what mad project it may have in view. It must be encouraged, on the contrary, to carry out any act of folly, simply to show that it is free and independent. Owing to this absurd desire always to support the Turks, to aid and abet them in everything, to shut his eyes to their faults, and to consider everything said against them as mere Russian slanders, he is in a measure responsible for the Bulgarian massacres. He is to blame for not preventing the calling out of the Bashi-Bazouks, as a friend to Turkey should have done if necessary.

He is to blame for pretending not to believe the reports of the massacres, when they were pouring in upon

him from all sides, and for not reporting to his Government. He had the most trustworthy evidence that these massacres were occurring daily. The Rev. Dr. Long, of Robert College, showed him a mass of letters he had received from the burnt districts, and he returned them, saying he could not act upon such information, because it was not official. By official information he meant, I presume, information received from the Turkish authorities. It is generally supposed that ambassadors and diplomatists prefer unofficial and private information when it is trustworthy to that received from official or officious sources. It is popularly believed that it is part of the business of an ambassador to keep his Government supplied with important information and facts, no matter from what source obtained; but Sir Henry Elliot understands his duties in a different way.

His duty was to defend the Turks through thick and thin, and to shut his eyes to their atrocities; and that is what he did. But there were still other sources of information. The French, German, Austrian, Greek, and Russian Consuls made accurate weekly reports of everything that happened, which Sir Henry might have seen—which, for anything I know to the contrary, he did see. There were the reports of the German railway officials living in the country in sight of the burning villages, near enough to smell the rotting bodies, whose reports he might likewise have seen. But Sir Henry believes the Greek, Austrian, German, and Russian Consuls, and the German railway officials, and the American missionaries are all in the pay of Russia. Their reports were, therefore, utterly worthless. He even had a report or two from Mr. Dupuis, Consul at Adrianople, which, for unexplained reasons, he looks upon as exaggerated; and still he did not inform his Government. He did not even offer to investigate to see whether there might not be after all some grains of truth in all these reports. He sent his dragoman to the Porte, to inquire into the matter, and the dragoman came back with the assurance that the Turks were as gentle as sucking doves in their dealings with the Bulgarians, and that the latter were everywhere slaughtering the unresisting Mohammedans. And Sir Henry Elliot smiled benignantly, and said, "I knew it," and made no report. Sir Henry is to blame for asserting in the face of the mass of evidence that he had before him, that the reports of the newspapers were exaggerated. He is much to blame for making, without the slightest evidence, without a shadow of proof, the reckless, the shameless assertion that the Bulgarians had committed atrocities equal in number and heinousness to those of the Turks. And now, if Sir Henry Elliot, instead of expressing his indignation at these acts of atrocity in the severest terms he can command, can still go on talking about exaggerations with the bones of thousands of helpless women, of poor hapless little children, whitening the fields of Bulgaria, and crying aloud to Heaven for pity, he is much, very much, to blame. He is unworthy to be the Ambassador of a Christian Queen, the representative at the Porte, or anywhere else, of a great-hearted and generous people.

I see that Mr. Disraeli read in Parliament a telegram from Mr. Baring stating that he thought the number of villages burnt in the whole of Bulgaria was about sixty, and the number of people killed 12,000. I do not know, of course, how Mr. Baring made this statement, nor whether he gave it as a whole or a partial statement. But as he, at the time of making this report, had only visited the district of Philippopolis, and could have had very little information regarding what had happened north of the Balkans, I am inclined to think that what he gave as a partial statement for the district of Philippopolis alone, Mr. Disraeli gave the world as a complete statement for the whole of Bulgaria. This may not have been done intentionally, but I am of the opinion that it will be found to have been so. Mr. Schuyler, when pursuing his investigations in the district of Philippopolis, estimated the number of people killed in that district alone at from twelve to fifteen thousand, and the number of villages burnt at from sixty to seventy. Since then, during his investigations north of the Balkans, he has obtained information that at least forty more villages have been burnt there, accompanied by the same acts of atrocity as south of the Balkans. I do not know what will be his estimate of the number of people killed there, and for my own part shall not hazard the statement of my own opinion, but I think I am safe in saying that Mr. Disraeli, unintentionally of course, gave to the world a partial statement as a complete one, and then, as usual, made assertions founded on this incomplete statement about the exaggerations of correspondents.

The past is past and beyond recall. The dead are dead, and without the pale of human aid and succour, as they are beyond the reach of sorrow and suffering. Turkish ferocity has done its worst for them, and they are perhaps not the most unfortunate to have escaped even at this cost. It is of the living we have now to think, and their condition is lamentable. There is no security for life or property in Bulgaria. The Turkish population is armed; the Christians have been disarmed, and the former do as they please. There is nothing, absolutely nothing, to restrain them, but their own consciences, and what a restraining power that is can be inferred from the horrors of Batak. The Bulgarians are unresistingly robbed and plundered daily by their Mussulman neighbours. They are forced to work for them without pay. They are in some places obliged to pay for the permission to gather their own harvests. Their cattle and horses are taken from them. If they complain, or make the slightest show of resistance, they are beaten and sabred. In addition to this, their women are seized and out-raged in the most flagrant and open way. When we were at Kritchina we saw a number of people from the neighbouring village of Tchanaktchi, who had come there to beg or borrow money to enable them to rebuy their cattle from the Turks, who offered to restore them if they would pay a certain sum on each head. The poor

people had not obtained any money then, and there did not seem to be much likelihood of their doing so. In another village near there, whose name I have forgotten, but which is known to Mr. Schuyler and Mr. Baring, the people were only allowed to get in their harvests upon condition that half of the whole crop should be given to their Turkish neighbours. This was within ten miles of Philippopolis. At Perustitsa, which is still closer, the people who escaped the massacre and the pillage, after the burning of their houses, had still some cattle left in the fields. These were seized by the Turks of the neighbouring village of Ustuna, who still refused to restore them when we were there. After we left, fearing we might go to the governor and insist upon justice being done, they drove the cattle off into a distant part of the country and sold them. While Mr. Schuyler was at Avrat-Alan some Turks from a neighbouring village seized six horses at work in the fields not more than a mile away, and took them off. We spoke to the Mudir of Avrat-Alan about this, but he said he could do nothing. He had no authority over the Turks of the village where the horses had been taken, and if he sent his zaptiehs there they would be beaten and sent back. At Otluk-kui a man presented himself to us with a fresh sabre cut in his head. He had discovered where his cattle were, and had gone with an order from the Mudir authorising him to take them, and this was the result of his attempt. On the way from Klissura to Avrat-Alan we met three Turks driving about thirty head of cattle, which they offered to one of our servants for less than half price, and which had evidently been stolen. At Otluk-kui a woman among many others came to us, and said that only two clays before she had been working in the fields near the village with a man and a boy, her neighbours, when the Turks came, seized and bound the man, and then all three violated her. They were Turks from the next village, and the neighbour who was working with her at the time knew them very well. At Philippopolis even two men and a boy came to Mr. Schuyler with fresh sabre cuts received only a few days before. One of these had eight gashes in his head and different parts of his body, At Slievena more people came to us with fresh sabre cuts, and at Turnova even the boy who brought us our dinner was seized and beaten by the zaptiehs, who of course did not know he was in our employ.

The night we were in Tamboli a boy was killed by some Turks under circumstances which we had no time to investigate. People came to us from Streletia, a burnt village, where the people had nothing left, and said not a day passed but some women were violated by the Turks. Two men came to us from Mishka with the same story, that there was not a day that some act of violence was not committed, especially towards the women. Near Tatar Bazardjik we met a dozen men tied together in twos, under the guard of three or four zaptiehs, who were conducting them to Tatar Bazardjik, and at the latter place Mr. Schuyler obtained convincing proof that one Ali Bey, who had some sort of unrecognised occult authority in the place, arrests men of the well-to-do class upon a charge of having belonged to the Insurrectionary Committee, puts them in prison, and maltreats them in various ways until they are glad to ransom themselves at the rate of from fifteen to fifty pounds apiece. There were three beys in and about Tatar Bazardjik who were engaged in this profitable occupation, one of whom was Tassun Bey, the person who destroyed Klissura and who accompanied Mr. Baring when he went to that place. The same thing occurs at Sofia on a much larger scale. There the business is taken in hand by the Kaimakam, who often exacts as much as £500 ransom. At Tamboli the people are completely in the power of three or four beys, or Turkish notables, who virtually govern the place, and in whose presence the Kaimakam does not pretend to any authority. In our presence they gave orders which it was the business of the Kaimakam to give without even consulting him, and he stood by, silent and obsequious, without offering an observation. The people there were held in such a state of terrorism by these beys that very few dared to come to us, and those only after night, in the most secret manner.

If you speak to the authorities about the acts of lawlessness that are committed every day within their own jurisdiction, they will either deny that they have occurred at all, and tell you that the victims are liars, or they will avow flatly and openly that they are as powerless to redress these grievances as to prevent their recurrence. Or they will ask why these people come to us and complain instead of going to the proper authorities. The answer is simple. They do go and complain where they dare, but in most cases they are afraid. They know it would be not only useless but dangerous. What would be the good, for instance, of making a complaint against Galib Bey, of Tamboli, before the above-mentioned Kaimakam? The Kaimakam seems to be nearly as much afraid of Galib Bey as the people are. In addition to all this, the people are kept in a state of terror by threats of more massacres, which are freely made by the Turks. Everywhere all over the country the people are in constant dread of the recurrence of the scenes that took place at Batak, Otluk-kui, and Bazardjik—a dread which is only too well justified by the conduct of the Turks. Then, besides this state of terrorism, which is kept up by continual acts of violence, there are thousands of people who have escaped from the massacres with their lives only, who have been pillaged and robbed, whose houses have been burnt, and who have not a roof to shelter them, nor bread for the morrow. The Turkish authorities, in spite of reiterated assurances that help was to be distributed, that the cattle were to be restored to their owners, and the burnt villages to be rebuilt, have done absolutely nothing, are doing nothing, and will do nothing. Take the village of Klissura, for instance, which was destroyed by Tassun Bey, and which was a very flourishing little place. There were 700 houses here,

not one of which was left standing. The Mudir told us that there were not more than fifty families in a condition to rebuild their houses, or any substitutes for houses even, as they had absolutely no means to work with. They did not know what the people would do when winter came. The people here were principally engaged in the cultivation of the rose and the manufacture of attar of roses. There were from 130 to 150 small manufactories, with about 500 retorts, or copper boilers, for distilling the rose leaves. These retorts, worth each about £10, represented an aggregate capital of £5,000, all of which, together with everything of the least value, were carried off by their Turkish neighbours, under the command of the ubiquitous Tassum Bey. Not only did they carry off the furniture, and drive away their cattle, but they even carted off the tiles from the roofs; and after the village was reduced to ashes, they raked among the cinders for iron and nails, so thoroughly and systematically was the work of pillaging conducted.

In spite of repeated promises, neither the retorts nor the cattle have been restored. The Mutle-Serif, of Philippopolis, told Mr. Schuyler and. Mr. Baring that a great many of the lost cattle from all over the country had been assembled at Philippopolis, and that the orders had been sent for the people to come in to identify their own and take them. A very just and equitable arrangement. You had only to come—perhaps fifty, perhaps a hundred miles, and identify your cattle, prove they were yours to the satisfaction of the Turks, and then you could have them. Mr. Schuyler and Mr. Baring were delighted with the arrangement, it seemed so simple and so easy. I do not know but what Mr. Baring is still convinced of its beauty and efficacy. Mr. Schuyler, who has a faculty for finding out hidden things, found, however, that strict orders had been issued that nobody be allowed to leave his village without a special passport. The people were quite free to come to Philippopolis and claim their cattle—nobody could be freer—only they must do it without leaving their own villages! Nothing could better illustrate Turkish methods of meeting European demands for justice and reform. At Klissura the people were not allowed to leave the crumbling ruins of their houses. They were not allowed to go and work for the people of other villages, to beg, to ask for help. They were not even allowed to pay a visit to a friend or neighbour in the next village. The Mudir found this a most oppressive and absurd regulation. Many of the people here, besides being occupied with the manufacture of attar of roses, engaged in trade in a small way, and travelled during the winter as far as Constantinople, and even into Asia Minor. Had they been allowed to leave the village they might have begun with their credit, and their aptitude for trading, to rebuild their ruined fortunes and homes. Instead of which they were obliged to remain doing nothing—rapidly consuming what they had gathered of the harvest before it was spoiled, with the prospect of starvation and cold staring them in the face with the incoming winter. The Mudir told us he had written three times for permission to allow those of the people who found it advantageous to leave the village to do so. He had received no answer. He had written thrice for authority to seize a number of cattle belonging to the village, that he knew to be in a neighbouring Turkish village, and he had received no answer. When Mr. Schuyler asked the Mutle-Serif, of Philippopolis, about this, he impudently asserted that there was no order forbidding the people to leave the village, and that the Mudir had full powers to seize cattle wherever he found them. Here in Klissura, as at Batak, several children and young girls had been carried off to the neighbouring Turkish villages and "converted," as the term is, to Mohammedanism. The parents of these children and girls had up to this time, that is after three months, been unable to get them back, and were in despair. There were many cases of the same kind at Tatar Bazardjik and Philippopolis. I can now, I think, form a very good idea of the kind of "conversion" that was worked on the young girl at Salonica, which resulted in the death of the German and French Consuls.

When we left Klissura two or three hundred miserable, haggard women, mostly with children in their arms, ran after us for a mile, crying and wailing in very despair at our having come and gone without bringing them any relief, or wrought any change in their miserable condition. It was the same at Otluk-kui. When we left, three or four hundred people set up a perfect wail of despair, saying that after we were gone they would be worse maltreated than ever. The state of things which I have described as existing in Otluk-kui, Batak, and Klissura is the same in more than a hundred Bulgarian villages. The misery is too fearful to think of with calmness. I am still under the impression of what I saw there. The cries and heart-broken sobs and lamentations of these miserable women and children are still ringing in my ears; their wretched, haggard, despairing faces are still before my eyes; they follow me day and night wherever I go, sleeping or waking, haunting me like so many spectres. Alas! they will soon be spectres indeed, unless something is done for them. Disease, hunger, famine, and cold will soon do for them what the sabre left undone.

To sum up. The country is in a state of complete anarchy. The Turkish authorities fail in the two great functions of government—the administration of justice and the maintenance of order. They flatly refuse to protect the Christian population against the Mohammedans, or frankly avow their inability to do so. The Kaimakams and Mudirs say their zaptiehs cannot execute their behests because the Turks everywhere resist them. The Mutle-Serif of Philippopolis says he can do nothing without cavalry to quell the Mussulman population. This may be only a pretext or it may be the truth; but I do not believe he would use cavalry, if he had it, to protect the Christians. The Turkish authorities will do nothing. They will, if possible, prevent anything

from being done. At Philippopolis the people wished to get up a subscription for the sufferers. The Mutle-Serif refused permission, saying the Government was giving them all the help that was required. That is none at all. There is no counting, no calculating with Turkish perversity; no foreseeing what it will or will not do. Why he should refuse to allow a subscription for these starving women and children nobody but a Turk could tell. Unless Europe takes the matter in hand, nothing will be done for these poor people. Unless the Christian Powers that hypocritically took these people under their protection, in order to turn them over bound hand and foot to the tender mercies of these barbarian Turks, now come forward and do something, these wretched women and children must die of disease, cold, and famine. Mr. Schuyler, who when he left Paris some three months ago was strongly Turkophile in his leanings, has been so deeply impressed by what he has witnessed here, the wide-spread ruin and desolation, the misery which is augmenting day by day, that he has determined, as I have already telegraphed you, to make an effort to bring about a foreign intervention, and the appointment of a Commission for the protection of the people. He will propose that this Commission see that the following measures are carried out :—First, the hanging of Achmet-Aga, the destroyer of Batak; of another Achmet-Aga, equally infamous, who distinguished himself at Perustitza; of Chefket Pacha, who has been promoted to a position in the palace of the Sultan; and of Tassum Bey, to whom I have had occasion to refer several times; second, the disarming of the Mussulman population; third, the rebuilding of the burned villages, and the indemnification of the people for their losses, at the expense of the Government.

There is no doubt that if these measures be not executed without delay there is imminent danger of another Mussulman rising any day that will far surpass anything that has yet happened. In case the Turkish arms should meet with a reverse in Servia, nobody doubts but there would be a general rising of the Mussulman population against the Christians, who are now without arms. I heard Mr. Guaraccino and Mr. Baring both remark that the Bulgarians ought to pray with heart and soul for the success of the Turkish arms, for that in case of defeat the whole Bulgarian population would be swept out of existence. Such an avowal from Mr. Guaraccino speaks volumes as to the present condition of the Bulgarians. Will Mr. Schuyler succeed in having these measures carried out? I do not think it. The comfortable old gentlemen who are directing the destinies of Europe are too well fed to care for these wretched women and children, who are starving to death; they are too well housed themselves to think of weak, sickly little babes sleeping on the ground, with no roof to shelter them from the dews and the rains of Heaven. There is no danger of their houses being burnt over their heads; there is no danger of their wives and daughters being violated by bands of ruffians; there is no danger of their little ones dying of starvation. They can take an elevated and statesmanlike view of these miserable starving women and children, and they will not oppose the appointment of a Commission to protect them.

PHILIPPOPOLIS, *August* 16.

We arrived in Otluk-kui late at night, and had some difficulty in finding a house to put up at, as everybody had gone to bed. Finally, however, we met a man who conducted us to the house where Mr. Baring had stopped only the night before, and here we received a very hearty welcome. The people of the house had, however, very little to offer us in the way of sleeping accommodation, as they had been pillaged, and everything of the slightest value taken, even to the cooking utensils. I have already described what occurred at Otluk-kui, and need only add a few details here that were left out of my previous letter. There were about four hundred houses burnt out of the two thousand in the place, and, from a material point of view, the town suffered less in comparison than the other villages that were, for the most part, completely destroyed. The two churches and the bazaar were burnt, as were the two boys' schools. The girls' school escaped destruction only because it had not been pointed out to the incendiaries.

But the burning of schools and churches, and even of private dwellings, are acts which sink into comparative insignificance, and seem hardly worth mentioning in the presence of the fearful atrocities against humanity that were committed here. The story of the insurrection, in spite of its mournful character, is not without an amusing episode or two. There was a Jew pedler here when the affair broke out, who came to us and gave us an account of what had befallen him. The insurgents, suspecting he might go away from the village and relate what was going on, arrested him in order to prevent any such move- ment, and they finally decided to ensure his silence and secrecy by forcing him to renounce Judaism. He says they put a Bulgarian cap on his head, and gave him the Christian name of "Ghiorghy," or George. It does not appear that they went so far as to baptise him, however; nor does it seem that they placed much confidence in his conversion, for they kept him in prison in a private house, and would not let him leave the village. This fear was not altogether unfounded, as it turned out; for when the Turks arrived and set him at liberty, he went about the town with the Bashi-Bazouks, and pointed out to them the rich people, and the fine houses where they would find the most booty. Apart from the violence they did his feelings in converting him, and giving him the name of "Ghiorghy," he acknowledges that the people were very kind, and gave him plenty to eat and drink during the week he was in their power. He was quite impartial in his relation of what he saw and heard, not seeming to care a fig which side won, and recounting what occurred in the most indifferent and cynical manner. He was a backslider, too, having gone

back to Judaism, and he even expressed his willingness to change his religion again in case he found any advantage in doing so, thereby disclosing a want of principle that was shocking to contemplate.

There was nothing wanting to complete the horror of this affair of Otluk-kui. An old woman came to Mr. Schuyler, prostrating herself on the ground, and walking towards him on her knees, saying, "Oh, forgive me, most noble Sir, I am unworthy to appear before you; I am a very great sinner, a very great sinner, a very great sinner, a very great sinner, a very great sinner." There is no telling how long she would have gone on repeating this assertion had we not stopped her and compelled her to rise and tell her story. It was simply fiendish in its grotesqueness. She was a withered old woman, past sixty, with shrivelled face and limbs, with grey hair, and all the marks of age that claim respect and veneration. Well, this old woman was violated in the same room with a number of girls. We could not have believed it had we not heard of many other cases just as bad. It would seem that the devil had taken human form in order to mock, scoff, degrade poor humanity, and drag it through the mud and filth. There was displayed here a diabolical kind of impishness or demoniac mockery of everything that man holds venerable and holy that was simply-superhuman in its devilry.

It should be remembered that this old woman's was no exceptional case, for there does not appear to be a woman in the place, old or young, who escaped outrage. The most curious, and at the same time the most poignant, circumstance connected with these outrages is that these women and girls all, like this old woman, look upon themslves as very great sinners. The chastity of the Bulgarian women is well known, and it is the sin as well as the dishonour which crushes them, a sin for which they will do life-long penance and then not think themselves forgiven. Not one of these young girls ever expects to find a husband : not one but thinks herself unworthy of marriage. Nor do the young men of the place think differently. They will in future go to villages that have not been visited by Bashi-Bazouks to seek their wives.

The Mudir of the place called on us the next morning after our arrival: the same Mudir who so horribly maltreated the young schoolmistress. He was decidedly the most repulsive and filthy-looking brute I ever set eyes upon. Apparently Mr. Schuyler thought the same, for after the exchange of a few words in which there were no compliments, he retired to his room and left the Mudir to be entertained by the rest of us. But he had not done with him by any means, as we soon discovered, for the interview was prolonged though in a somewhat extraordinary manner.

Mr. Schuyler had with him two interpreters. One was a young Bulgarian from Robert College, who spoke the Turkish language in a very polite and distinguished manner, and whom he always employed when he had anything agreeable to say or any compliments to pass with the Turkish authorities; the other was a Greek, by the name of Antonio, employed in the legation, who spoke Turkish in a very harsh and emphatic manner, whom he usually called up when he had anything the reverse of agreeable to say. I was considerably amused now to see Antonio come out from Mr. Schuyler's room, and inform the Mudir, in a severe tone of voice, that the Consul Bashi was very much displeased at the state in which he had found the roads in this Mudirlik, and required to know why they were allowed to remain in that condition. The Mudir was considerably taken aback by this question and the way in which it was put, but he replied with some trepidation that he had only been Mudir here for two or three months, and must not be held responsible for the condition of the roads. This answer was carried back by Antonio, who a moment later returned with the information that the Consul Bashi had observed that there was much misery existing among the people here, and he could not hear that the Mudir was trying to do anything to relieve it. To this the Mudir replied that they had brought the misery upon themselves and must endure it. Antonio carried this answer back, and returned with the information that the Consul considered it very wicked on the part of these women and little children to have brought it upon themselves, but that he believed his Majesty the Sultan, in his sublime goodness, thought these people had been sufficiently punished for their wickedness already, and wished the misery of the people to be relieved as rapidly as possible, further expressing his belief that the Sultan would now turn his attention to punishing bad Mudirs, of whom there were a great many. The conversation was carried on in this style by means of Antonio for half an hour, at the end of which time the Mudir was informed that the interview was at an end, and he withdrew, considerably overawed by this method of exchanging compliments. We never saw him again, as we did not return his call.

This is the worst Mudir we have seen or heard of. He is in the habit of getting drunk every night, in company with the zaptiehs, and he maltreats and persecutes the inhabitants in every possible way. I have already related how he sent for two women, whose husbands had been killed, to come to his house the nights that Mr. Baring and Mr. Schuyler were in the place. And this is the kind of man to whom is given almost unlimited power over a town of nearly 1,000 inhabitants, with no hope, as the Governor of Philippopolis told us of a better man being found to replace him. This village of Otluk-kui must have been a charming little place before its partial destruction. It is situated in a pretty little valley which is surrounded on all sides by mountains that seem to isolate it from the outside world. The houses, which are very comfortable and solidly constructed, are generally partly surrounded by gardens and fruit trees, whose luxuriant foliage hangs over the walls, and

half-hiding the houses themselves give the place a charming freshness, on which the eye would rest with pleasure were it not for the blackened ruins that greet you on every side, and continually remind you of the horrors that were enacted here. We took horses hero to continue our journey to Avrat-Alan, or Kuprishstitza in Bulgarian, situated a few miles to the north, still higher up in the mountains. The horses were brought to us about one o'clock, and we mounted amongst the crowd of people that had gathered around the door, and rode away, actually putting our fingers to our ears to shut out their mournful cries.

The horseback ride to Avrat-Alan proved to be a delightful change from the jerking and jolting of a Turkish carriage over a Turkish road. As we got up in the mountains the air became delightfully cool and fresh, and the woods which covered a great part of these mountains offered with their thick-set foliage a cool and inviting shade nearly the whole distance, under which we lazily loitered, glad to escape from human sound and suffering, and in no hurry to reach our destination. There was many a sparkling little stream that came leaping out from among the bushes and rocks like a laughing child flying into the arms of its mother; many a grassy little glade where our horses would stop and eat the rich green grass in spite of us, because we had not the moral courage necessary to take the food out of their mouths by spurring them on; and when we finally reached the summit of these mountains—really only the foothills of the Balkans—we looked back, and had such a view over the country below us as is rarely seen. For we had before us all that immense and beautiful plain, the valley of the Maritza, in which is situated Tatar Bazardjik, Philippopolis, and Adrianople, extending miles and miles away to the south, where it was bounded by that spur of the Balkans that sweeps around from the west in a grand and noble curve, and forms the watershed between the Maritza and the Ægean Sea.

A little further on we stopped to lunch in the middle of the forest, by the side of a spring called the "Brigands' Spring." I had observed a while after starting that our party had been augmented by the addition of a young man, riding a very lean horse, which he mounted on a pack-saddle. Upon inquiry, we found that this young man was from Otluk-kui, and was likewise on his way to Avrat-Alan, having joined our party for safety. Antonio, in a long and intimate conversation, drew from him an avowal of the object of his trip, which was no other than to see his sweetheart, who lived at Ayrat-Alan, whom he had not seen for three months—that is, since the troubles began. The poor fellow was extremely grateful for the permission to accompany us, and willingly took upon himself the office of guide, as neither of our two Zaptiehs seemed to be very certain of the way. He told us that at this spring only the year before he had been seized by the brigands, and robbed of the little money he had about him, and nearly all the clothing he had on. Going to see one's sweetheart any distance in this country is evidently a risky business. We counted up the shots our party could command in a fight at six shots to the revolver, and finding it was somewhere in the neighbourhood of a hundred, ate our cold chicken and mutton, slaked our thirst at the Brigands' Spring, smoked our cigarettes, and laughed the brigands to scorn. These brigands, by the way, complain greatly, it seems, of the present condition of the country, which scarcely furnishes them a living. Since the war all traffic is suspended, there are no travellers, and no merchandise passing backwards and forwards, and the result is that these people are deprived of their ordinary means of existence, the bread is taken out of their mouths, and they are gradually falling into a state of indigence pitiful to contemplate. These brigands are all Turks. Let our diplomacy look to it. Towards six o'clock in the evening we arrived at the brow of the mountain overlooking a very deep, narrow valley, or rather a hollow, in the bottom of which lay Avrat-Alan, seemingly almost beneath our feet.

Avrat-Alan was one of the three or four places south of the Balkans in which there was an attempt at insurrection. It may, in fact, be considered the principal offender, for although they made no fortifications here, the young men who took up arms committed the only really inexcusable acts that can be charged against the insurrection. This was the killing of forty Mohammedan gipsies who fell into their hands. These gipsies had been arming secretly, and it was suspected, but only suspected, that they were preparing to join the Bashi-Bazouks when seized, and on this suspicion they were killed. But neither here nor anywhere else were there any women or children killed or violated by the insurgents. This one fact gives the measure of difference between the Bulgarian and the Turk. The killing of armed men who have armed themselves, as you believe, with the intention of killing you, who you know are quite capable of killing you if they get the chance, is a very different sort of thing from the killing of weak, helpless women and innocent little children, whom you have not the slightest reason to fear. The one may be a mistaken or even an unjustifiable act of self-defence, but it is nevertheless self-defence; the other is an act of pure ferocity, of which not even the wild beast—not even the tiger, is capable. These places—Otluk-kui, Avrat-Alan, and Klissura, with Strelcha and Kurlovo—were the only places in which there was any insurrection south of the Balkans. For the fault of these five villages, seventy innocent villages that had no hand nor part whatever in the rising were pillaged and burnt, and the inhabitants for the most part massacred.

Let us now see what the rebellion was here at its fountain head; let us see how much vigour it showed here where it was organised and where it took its rise, and we can then form a better idea of its real strength, and the kind of repression that was used to put it down.

Here, in Avrat-Alan, there was even less show of resistance than at Otluk-kui. The elder and more prudent part of the population had not taken part in the rising at all, nor had they encouraged it. It was only the young men, and they had engaged in it contrary to the advice of their elders, who do not appear to have had any confidence in the success of the attempt. When, at the approach of Hafiz Pacha towards Otluk-kui, a great part of the insurgents had gone out to reconnoitre, the rest of the people, fearing the vengeance of the Turks, and hoping by this means to appease them, rose and seized the insurgents who had remained in the village, confined them in the konak, and sent word to Hafiz Pacha, informing him what they had done. I will not go so far as to say that they would really have kept these young men until Hafiz arrived, and have delivered them over to be shot. They would probably have allowed them to escape before the arrival of the Turkish commander, even had their companions not returned and released them. But this fact shows that the majority of the people even here took no part in it, and hoped nothing from it. This is why, at the approach of the troops, the whole thing collapsed like a bubble. No defence was made, and no resistance offered. There was not a single Turk killed in suppressing the revolt south of the Balkans. This one fact alone gives the lie to all the assertions about the dangerous character of the rebellion and the necessity the Turks were under, in the impossibility of bringing up regular troops, of calling out the Mussulman population. This one fact refutes all the assertions of the apologists and defenders of the Turk, and shows bow weak and childish an affair the insurrection really was, how cruel, brutal, stupid, senseless, was this organised pillage and destruction of a whole province, this indiscriminate butchery of innocent people, this wholesale slaughter of weak, helpless women and children.

The history of the affair at Avrat-Alan seems to be as follows : Upon the day fixed for the outbreak the insurgents assembled in a body about two hundred strong, marched quietly to the konak, or house of the Mudir, surrounded it, and summoned the Mudir to surrender. There were at the konak at this time, besides the Mudir, five or six Zaptiehs and an officer, all well armed. They barricaded the doors and windows of the konak, and determined to stand a siege. They defended themselves very courageously for twenty-four hours, though it does not appear that up to this time anybody had been killed on either side, notwithstanding the considerable amount of firing. The besieged, perceiving, however, that they would probably be overpowered in the end, determined to make a sortie and endeavour to escape from the place. This resolution they carried out with great courage and spirit, and all succeeded in breaking through the insurgents, who were not looking for this sudden onslaught, and who were altogether taken by surprise. But in the running fight which ensued, the Mudir and one of the Zaptiehs were killed, while the others succeeded in effecting their escape. These were the only Turks who lost their lives here, except the gipsies already spoken of, who were killed afterwards. The insurgents now had complete possession of the village, and had everything their own way for the next few days. It does not appear, however, that they did anything but march through the streets in procession, singing and declaring themselves free and independent. They did not molest any of the Mussulman villages in the neighbourhood; they were quite satisfied with what they had done, and did not seem to perceive that anything more was required of them. They appeared to be quite ignorant of the fact that there were 5,000 regular troops in Philippopolis who would inevitably be down on them in a few days, and they gave themselves over unrestrainedly to the enjoyment of their freedom. These enjoyments seem to consist principally in marching up and down the streets and singing the national Bulgarian airs. Only in one instance did they show themselves alive to the necessities of the situation. The Christians of the neighbouring village of Strelcha, finding that insurrection was such an easy and pleasant thing, like-wise determined to rise. But as half the population of this village were Turks, who would probably object to this step, they sent to Otluk-kui and Avrat-Alan for aid. A number of the insurgents accordingly went to their assistance; a fight ensued between them and the Turkish population, during which the whole of the village was burnt. The Christians say it was the Turks who did it. And the Turks say it was the Christians. The probability is, that both parties have had a hand in the burning, and that the Turks burned the Christian quarter and the Christians the Turkish quarter. This is the only case we heard of where the Turks were molested by the Christians, and being a mixed village, once a rising had been determined upon, a fight was of course inevitable. But even here the Turks do not complain that there was a single Turkish woman or child killed or violated. The women and children on both sides ran away into the fields and remained away until the fight was over. But as the Turks finally gained the upper hand, they wreaked a fearful vengeance on their Christian neighbours and upon their wives and children. I will not dwell upon this fact, however. The Turks of this village had at least a pretext for their acts of cruelty, and I am willing to make all allowance for their exasperation at the sight of their burning homes. It is the one case in which the Turkish population was molested by their Christian neighbours, and although they took a terrible vengeance, it was nevertheless a vengeance, and not like those cold-blooded, unprovoked, inexcusable acts of cruelty and ferocity that were committed everywhere else. After the massacre of Batak, and the unprovoked atrocities at Otluk-kui a mere act of vengeance, however cruel and however unjustifiable, seems to sink into a venial offence. It is the one case in which the Turks had a shadow of a pretext for what they did, and I am willing to allow them all the credit to be derived from it. But the Turks of this village have been repaid their losses by the Turkish authorities; their

houses are being rebuilt for them at the public expense; their cattle were never driven away; there were not half-a-dozen of them killed in the fight, for the fighting in this country is not deadly—it is only when the Christians surrender their arms that there is any great loss of life. They have besides seized all the cattle and live stock of their Christian neighbours. They are better off from a worldly point of view than they were before. So we may spare any compassion we might otherwise have felt for them. They have in reality turned their Christian neighbours into slaves, forcing them to work for nothing, refusing them permission to gather their own harvests, except upon condition of sharing it half and half, and finally violating their women with impunity. This state of things exists at Strelcha at this moment, and there is no remedy for it.

To return to the story of events that occurred at Avrat-Alan. The young men here soon began to discover that an insurrection required, to make it a success, something more than marching up and down the streets singing Bulgarian airs. Hafiz Pacha marched upon Otluk-kui, took it without losing a man, and then marched upon Avrat-Alan. They immediately fled to the mountains, and left the village to take care of itself. Hafiz Pacha approached upon one side, and the Bashi-Bazouks upon the other. The people who had taken no part in the outbreak decided to send to Hafiz Pacha and tender their submission. They sent two priests, one to the Bashi-Bazouks, who was immediately killed, and the other to Hafiz himself. Hafiz had apparently satisfied his thirst for blood and his desire for amusement at Otluk-kui; he was now disposed to do a little stroke of business, and he consented to treat with the inhabitants. He ordered that all the men of the place should come outside of the town to his camp, in order to discuss the terms on which he would accept their submission. They were detained in the camp two days, and during this time the Bashi-Bazouks and many of the troops entered the town. They did not, however, commit the same excesses as at Otluk-kui. They did not burn the town, nor did they kill any women and children. Hafiz Pacha had probably given orders that this should not be done, and his orders were obeyed, just as they were at Otluk-kui. They besides had also, perhaps, glutted their thirst for blood at the latter place, and were now satiated. But they pillaged every house, and they violated nearly every woman and girl in the town.

There were many well-to-do and comparatively rich people here. They have all more or less education and refinement; the houses were well and solidly built, with many appliances of comfort, and even what might in this country be considered luxury. The women we observed were generally comely, and even pretty. They dressed well, and made some pretensions to elegance in their poor way, giving many evidences of refinement and culture. And these gentle, sensitive, modest women were seized and violated by brutes whose hands were still red from the slaughter of Otluk-kui, whose clothes were still reeking with the blood of young girls and children whom they had outraged and slain. The women were stripped naked, and in the presence of each other submitted to every species of degradation and infamy that the foul and debased imagination of a savage could invent. Nay, more. A simple savage, with all the untamed ferocity of a savage state, still keeps within the bounds of Nature. He has not yet learned to overstep the limits which Nature has fixed. These Turks, on the contrary, seem to combine all the degrading vices of an artificial state with the unbridled lust of a barbarous race. And these gentle, virtuous women and girls were left in the hands of these beasts for two days, subjected to revolting, brutal, debasing treatment, that must leave its blot and its stain through life. Many of these women came to Mr. Schuyler to relate their woes. They would generally begin talking very quietly, and you could see that they had schooled themselves to calmness beforehand. They had a great idea of the dignity and importance of a Secretary of Legation, and it was touching to see their efforts to conduct themselves with proper decorum and to maintain a becoming composure. But the merest glance sufficed to show that this calmness was all assumed, that they were trembling with emotion. There was a paleness in the face, a nervous twitching of the features, and a tremor in the voice, threatening at every moment to break into a sob that showed only too well the feelings with which they were struggling. Then, as the story went on, they would suddenly stop, break down in the middle of it, bury their faces in their hands, and with a storm of sobs and tears that were strangely contagious avow that they could go no further.

God knows, they had generally gone far enough before this breakdown would come. They had bravely confessed dishonour with only a tremor of the voice, but there was worse yet. A woman, it seems, can suffer more than mere dishonour at the hands of a Turk. She can be stained, defiled, degraded, until she looks upon herself with horror and loathing. And many of these women were not weeping for themselves alone, but for their daughters as well—young, innocent, tender girls of twelve and fifteen; nay, even children, often maltreated in the same brutal manner. It may be asked why these women should thus come forward and avow their shame and their dishonour? Who can tell? A burden of injustice too great for endurance; wrongs too foul, too dreadful to be borne in silence; the poor wounded spirit impelled by some invisible power to shriek them out, that Heaven may hear if it cannot see, and the feeble, the forlorn hope, perhaps, that some time they may yet be avenged, and justice yet be done. It would be useless for me to go on repeating the stories that were told us. I do not wish to be accused of dwelling needlessly upon these revolting details. Some of these stories are enough to drive one mad. You cannot listen to them without a feeling of almost ungovernable rage, all the more

intense because it is utterly impotent and powerless, for you can do nothing. There is no justice for these people : there is no redress for the wrongs of these young girls. They must carry this stain and this dishonour through life; they must carry these wrongs to the grave. There is no punishment for the perpetrators of these crimes, absolutely none. As far as all human probabilities go, these men will die in their beds in the odour of sanctity, calling upon the God of Islam, and not even conscious of their crimes. Besides those who came singly to tell their woes, a delegation of ladies called upon Mr. Schuyler, but they had comparatively little to say. They seemingly could not bring themselves to speak in each other's presence of what they had suffered, and it was not until they went away that we perceived the real object of their visit. For, upon going, they handed Mr. Schuyler a letter signed by them all, in which they gave a short but comprehensive account of what had happened. If Mr. Schuyler is at liberty to give this curious document to the world, he will probably do so in his report, but I am under the impression that they requested him not to publish it.

While these things were occurring, Hafiz Pacha was secretly negotiating with the men whom he retained prisoners in the camp the terms of the ransom of the village. They were agreed upon, the money, after much difficulty, was finally raised, and the men were set at liberty and allowed to return to their ravaged homes. Mr. Schuyler has, I believe, obtained all the facts of this transaction, though with much difficulty. The people are yet fearful of the vengeance of Hafiz, and should he ever discover the persons who told about him he would probably soon find means to pay them out; for this money was not levied upon behalf of the Government, but for Hafiz Pacha's own private exchequer, and the Government, needing money as badly as it does, may even yet ask him to pay it into the treasury. The number of people killed here was, I believe, between 200 and 300, among whom there were comparatively very few women and children. They were principally those who attempted to fly from the village, and were overtaken by the Bashi-Bazouks and killed in the country.

Mr. Schuyler's Preliminary Report on the Moslem Atrocities.

THE following is the *preliminary* report of Mr. Schuyler, the American Consul-General, to the Hon. Horace Maynard, the American Minister, resident in Constantinople. At the date of its appearance, Mr. Schuyler was still in the ravaged district pursuing his inquiries.

PHILIPPOPOLIS, *August* 10, 1876.

SIR,—In reference to the atrocities and massacres committed by the Turks in Bulgaria, I have the honour to inform you that I have visited the towns of Adrianople, Philippopolis, and Tatar-Bazardjik, and the villages of Stenimakho, Kadi-Keni, Kritshma, Perustitsa, Peshtera, Radulovo, Batak, Kalaglari, Panagurishta (Otluk-kui), Koprishtitsa (Avrat-Alan), and Klissura (Persiden or Dervent), in the districts of Philippopolis and Bazardjik.

From what I have personally seen, and from the inquiries I have made and the information I have received, I have ascertained the following facts.

During the last winter and spring, agents of the Bulgarian Committee at Bucharest made an agitation in Bulgaria for an insurrection against the Turkish Government, and met with considerable encouragement among the younger part of the population. Owing to the betrayal of the plot, the insurrection broke out prematurely on the 1st and 2nd of May in the villages of Klissura, Koprishtitsa, Panagurishta, Novo Selo, Bellova, and, perhaps, one or two others. There was great alarm, and even a panic, at Tatar-Bazardjik and Philippopolis; numerous telegrams were sent to the Porte for regular troops, which after some delay were refused. The Beys of Philippopolis and Adrianople practically seized on the government, and armed the Mussulman inhabitants of the town and of the country, arms being sent for that purpose from Adrianople and Constantinople. These armed Mussulmans, called irregular troops or Bashi-Bazouks, were then, together with the few regular troops at hand, sent into a campaign against the Bulgarian villages, for the purpose of putting down the insurrection, and of disarming the Christian population. But few Circassians seem to have been employed at this time. Their settlements are east of Adrianople. It was a [*unclear: levéc en masse*] of the Mussulman villages against their Christian neighbours.

The insurgent villages made little or no resistance. In many instances they surrendered their arms upon the first demand. Nearly all the villages which were attacked by the Bashi-Bazouks were burned and pillaged, as were also all those which had been abandoned by the terrified inhabitants. The inhabitants of some villages were massacred after exhibitions of the most ferocious cruelty, and the violation not only of women and girls, but even of persons of the other sex. These crimes were committed by the regular troops as well as by the Bashi-Bazouks.

The number of villages which were burned in whole or in part in the districts of Philippopolis, Roptchus, and Tatar-Bazardjik is at least sixty-five, of which the names are as follow :

This list may not be entirely correct, as many towns have both Turkish and Bulgarian names, and they may be repeated in one or two instances. Some villages, too, are probably omitted. Owing to the absence of statistics, it is impossible exactly to ascertain the population of each village, and in many cases I have not been able to learn the number of houses. In general, as long as the patriarch or father of a family is alive, his married sons live with him, so that there are frequently families of 15, 20, and even of 30 persons. The population of a village would be therefore larger than for the same number of houses in other countries. In the larger villages the lower stories of the houses are of stone, the roofs are tiled, the streets are paved, and there is a general air of comfort and well-being. Particular attention was given by the troops to the churches and schools, which in some cases were destroyed with petroleum and gunpowder. The altars were overturned, the pictures painted on the walls scratched and pierced, and the holy places defiled and desecrated.

Besides the villages, four monasteries were burned—St. Teodor, near Perustitsa; the Panagia and the Bezsrabrinitsa, near Kritshma; and St. Nicolas, near Kaloyerovo.

The Turks allege that many of these villages were burned by the insurgents for the purpose of compelling the Bulgarian inhabitants to join them. I am unable to find that such was the case in more than two or three instances, and even here the proof is very weak. At Bellova the insurgents burned the railway station, in which some Zaptiehs had taken refuge.

It is very difficult to estimate the number of Bulgarians who were killed during the few days that the disturbances lasted, but I am inclined to put 15,000 as the lowest for the districts I have named.

The manner in which the troops did their work will be seen from a few details gathered on the spot from persons who escaped from the massacre.

PERUSTITSA, a town of 400 houses, and between 3,000 and 4,000 inhabitants, took no active part in the insurrection. Becoming alarmed at the attitude of the Turks in the neighbouring villages, the inhabitants sent a deputation to Aziz Pacha, the Mutessarif of Philippopolis, for regular troops to defend them. He returned them a written message that he had no troops to send, and that they must defend themselves. When the Bashi-Bazouks appeared before the town they therefore refused to surrender, entrenched themselves in a church, retreating finally to another, and held out for five days, until they saw the regular troops under Rashid Pacha, when the remainder gave themselves up. Many of the inhabitants escaped at the beginning of the struggle; but many were shot down. The church was bombarded, and about 1,000 in all were killed—many of them women and children. The town was pillaged and completely burned; not a single house being now standing. Many women were violated. The floor of the church, the churchyard, and many of the gardens were dug up afterwards in search for buried treasure. The Bashi-Bazouks here were commanded by Ahmed Aga of Tamrysh, who was subsequently rewarded with a silver medal.

KLISSURA was nearly twice the size of Perustitsa and proportionately richer, as many of the inhabitants were engaged in the manufacture of attar of roses, and many were merchants travelling through the country. The insurrectionary movement began here on the 2nd of May, but it was not until the 12th that the Bashi-Bazouks, under the command of Tussum Bey of Karlovo, attacked the place. A few shots were fired, when the villagers surrendered and fled to Koprishtitsa, and to the mountains. More than 250 Bulgarians were killed, chiefly women and children. The Turks claim that fourteen Mussulmans (in part gipsies) were killed before and during the fight. As soon as the Bashi-Bazouks entered the town they pillaged it and burned it. Among other things, 450 copper stills used in making attar of roses were carried away to the Turkish villages. Subsequent parties carried off all that was left, even to the nails from the doors, and the tiles from the roofs. The church was desecrated and blown, up. Tussum Bey for this exploit was decorated with the Medjidié.

KOPRISHTITSA (Avrat-Alan), although one of the first villages to rebel, was one of the last to be attacked. Warned by the fate of Klissura and Panagurishta, the leading inhabitants themselves arrested the ringleaders of the insurrection, and sent to Philippopolis for regular troops. In spite of this the bearers of submission were fired on, and one, the priest Dontcho, was killed, the town was several times pillaged, many of the women were violated, and about thirty persons were killed. The town was not burned, and a general massacre was avoided by large presents of money paid by the leading inhabitants to the Turkish commanders. Three shots were, however, fired at the church, but did little damage. The villagers admit having killed ten Turks and forty gipsies, the latter being suspected of an intention to plunder the town. The Turks claim a total loss of seventy-one.

PANAGURISHTA (Otluk-kui) was attacked by a force of regular troops, together with Bashi-Bazouks, on the 11th of May. Apparently no message to surrender was sent. After a slight opposition on the part of the insurgents the town was taken. Many of the inhabitants fled, but about 3,000 were massacred, the most of them being women and children. Of these about 400 belonged to the town of Panagurishta, and the others to nine neighbouring villages, the inha- bitants of which had taken refuge there. Four hundred buildings, including the bazaar and the largest and best houses, were burned. Both churches were completely destroyed, and almost levelled to the ground. In one an old man was violated on the altar, and afterwards burned alive. Two of the

schools were burned, the third—looking like a private house—escaped. From the numerous statements made to me, hardly a woman in the town escaped violation and brutal treatment. The ruffians attacked children of eight and old women of eighty, sparing neither age nor sex. Old men had their eyes torn out and their limbs cut off, and were then left to die, unless some more charitably disposed man gave them the final thrust. Pregnant women were ripped open and the unborn babes carried triumphantly on the points of bayonets and sabres, while little children were made to bear the dripping heads of their comrades. This scene of rapine, lust, and murder was continued for three days, when the survivors were made to bury the bodies of the dead. The perpetrators of these atrocities were chiefly regular troops commanded by Hafiz Pacha. The Turks claim and the villagers admit the death of fourteen Mussulmans, two of whom were women who were killed with arms in their hands during a conflict with a party that refused to surrender to the insurgents.

While pillage reigned supreme at Koprishtitsa, and lust at Panagurishta, at Batak the Turks seemed to have no stronger passion than the thirst for blood. This village surrendered without firing a shot, after a promise of safety, to the Bashi-Bazouks, under the command of Ahmed Aga, of Burutina, a chief of the rural police. Despite his promise, the few arms once surrendered, Ahmed Aga ordered the destruction of the village and the indiscriminate slaughter of the inhabitants, about a hundred young girls being reserved to satisfy the lust of the conqueror before they too should be killed. I saw their bones, some with the flesh still clinging to them, in the hollow on the hill side, where the dogs were gnawing them. Not a house is now standing in the midst of this lovely valley. The saw mills—for the town had a large trade in timber and sawn boards—which lined the rapid little river, are all burned, and of the 8,000 inhabitants not 2,000 are known to survive. Fully 5,000 persons, a very large proportion of them women and children, perished here, and their bones whiten the ruins, or their putrid bodies infect the air. The sight of Batak is enough to verify all that has been said about the acts of the Turks in repressing the Bulgarian insurrection. And yet I saw it three months after the massacre. On every side were human bones, skulls, ribs, and even complete skeletons, heads of girls still adorned with braids of long hair, bones of children, skeletons still encased in clothing. Here was a house the floor of which was white with the ashes and charred bones of thirty persons burned alive there. Here was the spot where the village notable Trandafil was spitted on a pike and then roasted, and where he is now buried; there was a foul hole full of decomposing bodies, here a mill dam filled with swollen corpses; here the school house, where 200 women and children who had taken refuge there were burned alive, and here the church and churchyard, where fully a thousand half-decayed forms were still to be seen, filling the enclosure in a heap several feet high, arms, feet, and heads protruding from the stones which had vainly been thrown there to hide them, and poisoning all the air.

Since my visit, by orders of the Mutessarif, the Kaimakam of Tatar Bazardjik was sent to Batak, with some lime to aid in the decomposition of the bodies, and to prevent a pestilence.

Ahmed Aga, who commanded at the massacre, has been decorated and promoted to the rank of Yuz-bashi.

These atrocities were clearly unnecessary for the suppression of the insurrec- tion, for it was an insignificant rebellion at the best, and the villagers generally surrendered at the first summons. Nor can they be justified by the state of panic, which was over before the troops set out on the campaign. An attempt, however has been made—and not by Turks alone—to defend and to palliate them on the ground of the previous atrocities which, it is alleged, were committed by the Bulgarians. I have carefully investigated this point, and am unable to find that the Bulgarians committed any outrages or atrocities, or any acts which deserve that name. I have vainly tried to obtain from the Turkish officials a list of such outrages, but have heard nothing but vague statements. I was told by Kiani Pacha that the insurgents killed the wife and daughter of the Mudir of Koprishtitsa; but this Mudir had recently gone there, and had left his wife at Eski Saara, where she still resides, and had no daughter. I was also told of the slaughter of the wife of the Mudir of Panagurishta, but at the time mentioned that village had no Mudir. I was referred for information to Hafiz Nuri Effendi, a leading Turk of Philippopolis. In a very careful statement made by him, he sets the number of Mussulmans (including gipsies) killed during the troubles at 155, of whom twelve are women and children—the word children taken to mean any one under twenty years of age. I have been able to obtain proof of the death of only two of these women—at Panagurishta—who certainly were not intentionally killed. No Turkish women or children were killed in cold blood. No Mussulman women were violated. No Mussulmans were tortured. No purely Turkish village was attacked or burned. No Mussulman house was pillaged. No mosque was desecrated or destroyed. The report of the special Turkish Commissioner, Edib Effendi, contains statements on this point, as on every other, which are utterly unfounded in fact, and the whole report may be characterised as a tissue of falsehoods.

I am, Sir,

Yours very truly,

Eugene Schuyler.
THE HONOURABLE HORACE MAYNARD, &c.
Bradbury, Agnew, & co., Printers, White Friars.
The Great Sulphur Cure Brought to the Test; Sulphurous Acid in the Treatment of Disease.
By Robert Pairman, Surgeon, Bigger.
With a Preface by the Rev. J. Christison, A.M., Minister of Biggar.
Fifteenth Edition. Revised and Enlarged by the Author.
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Price One Shilling, or free by Post Thirteen Stamps.

Note.—Dr. Halliday Douglas and Dr. Warburton Begbie kindly allow the Author to publish the following extracts from their letters :—

Dr. Douglas says (29th October 1867) :—"I have read your Mss. with pleasure and very great satisfaction. Every thoughtful practitioner will thank you for the just and earnest character of your inquiry. The results you describe correspond with what I have had the opportunity of observing, and confirms me in the belief that the observations of Dr. Dewar have directed us to most important conclusions regarding the remedial value of sulphur," etc.

Dr. Begbie writes (Oct. 31, 1867),—"I have read your paper with interest and pleasure. Many of its suggestions are valuable."

Preface.

IN lately visiting the sick I witnessed not a little of what is detailed in the following pages, and heard a great deal more from persons rejoicing in their recovery, and looking—some of them at least—as if they had been cured by magic. And no wonder; for who would have expected, at this time of day, such astonishing effects from the application of common sulphur? Strange that it should have stood on the Pharmacopoeia for hundreds of years, with nine-tenths of its virtues unknown and unsuspected till within the last few months! Let us be grateful, however, to a beneficent Providence that they have become known to us at last, that we have received a new gift of greater value, perhaps, than Vaccination or Chloroform; not a mere specific for any one disease, however grievous, but something more nearly approaching to the character of a panacea than any other application known. But, after all, these allegations must not be regarded as established certainties, till they have undergone the test of a wider experience. In the meantime the trials made in this district have been very promising indeed : their further prosecution is in excellent hands. Dr. PAIRMAN'S name is a sufficient pledge that it will be conducted skilfully, and that the result will be as faithfully recorded.

J. Christison, A.M.
BIGGAR MANSE, 29*th October* 1867.

Note for Third Edition.

FROM many kind congratulatory letters which the issuing of my pamphlet has called forth, I have great pleasure in selecting the following. Being highly important, both from the eminence of the writers and value of the practical hints contained in them, I give them entire :—

From Dr. LYON PLAYFAIR, Professor of Chemistry, University of Edinburgh.
'14 ABERCROMBY PLACE, EDINBURGH, *Nov*. 9, 1867.

MY DEAR SIR,—I have read your Sulphur pamphlet with so much interest, that, though personally unknown to you, I cannot refrain from writing to you. Sulphurous acid, as a disinfectant, is among the oldest used disinfectants. Ulysses employed it to purify his mansion after he slaughtered Penelope's suitors. It seems to act in two ways:—(1.) By killing fungi and infusoria; (2.) By producing ozone during its own oxidation in the air, and thus acting also in the manner of Condy's fluid, though in a much weaker way.

'In the first action it is only excelled by carbolic acid, which, however, does not appear to have the second power.

'In pursuing your inquiries, I would venture to suggest that you might sometimes with advantage add carbolic acid, but not in too large quantity. About 5 per cent of carbolic acid to 95 per cent, of the true sulphurous acid in its watery solution, appears to increase largely its destructive effect on the lower forms of organic life, without destroying the indirect oxidising agency of sulphurous acid. Although the latter is used in chemistry as a deoxidiser, I need scarcely say that I am not writing in ignorance when I still ascribe to it the

reverse effects also.—Yours sincerely,
'LYON PLAYFAIR.'

From Dr. JOSEPH BELL, F.R.C.S.E., Lecturer on Surgery, Assistant Surgeon, Clinical Wards, Royal Infirmary, and to the Eye Infirmary, and late Demonstrator of Anatomy in the University of Edinburgh.
'5 CASTLE TERRACE, EDINBURGH, *November* 11, 1867.

'MY DEAR SIR,—Though I am personally unknown to you, your name is so familiar that I cannot feel myself a stranger, and take the liberty of writing you a few lines.

'I have just finished the perusal of your most interesting pamphlet on Sulphurous Acid, and write to thank you for it most heartily.

'We have been working away with Dr. Dewar's plan a good deal; and for my own part I am thoroughly convinced that it is a most important addition to the *surgeon's* weapons, as a most agreeable dressing for wounds and ulcers, and, as an almost miraculous means of relief in all cases of croupy throats, laryngitis, and cynanche tonsillaris,—I have great faith in it.

'The cases which have impressed me most, however, have been :—Three very chronic and well-marked cases of *lupus non exedens* of the face—one of twenty years' standing—have been cured by it, and it alone. The patients come either to my house, or to the Thistle Street Dispensary, march in, get a few whiffs of spray over the face, and march out again with great delight. Professor Syme has, you may be aware, trusted for many years, in cases of *mentagra* and the chronic *scabby* sores of the face, to a lotion of acetate of lead and finely powdered *sulphur* in water.—Excuse my troubling you, and believe me to be yours faithfully,
JOSEPH BELL.

'Dr. PAIRMAN of Biggar.'

Preface to the Fifth Edition.

AN APOLOGY TO THE MEDICAL PROFESSION.

THE following pages present some data in solution of the problem, 'Is the system of sulphurous acid medication true or false?' The answer has a momentous bearing on the interests of our country, and our future modes of dealing both with cattle epidemics and human diseases not a few. Though professing himself as yet no advocate of the system out and out, but only its honest and impartial judge, it is needless to conceal that the more the writer sees of it, the more is he convinced of its general utility; and that very soon, to think of practising medicine without a Spray-producer, will be as absurd as to practise midwifery without forceps, or surgery without chloroform. To get the problem thoroughly sifted and solved, yea, to stir to its depths the whole profession if need be, a humble member, toiling in its ranks, ventured to risk his professional character by a quackish title-page, and adopted a style of writing perhaps unduly merry, partly to make people stare and induce them to read. For why should empiricism monopolize such a mode of inviting attention? and why should 'valuable solid reading,' the great horror of popular journalists, be allowed to fall still-born from the Press, to draw fine compliments merely from competent judges, and as many pounds sterling from the author's pocket? The writer of this pamphlet, however, is no buffoon, but bears the character among his neighbours of being an earnest man, whose peculiarly jocular and merry style can scarcely conceal a vein of seriousness. No newspaper critic or private friend has yet urged an objection that was not anticipated. One kind reverend gentleman, an earnest and zealous preacher of the gospel, said, 'Your title-page, sir, is a downright "puff," that reminds me strongly of Professor——'s quackish pills.' *A.* 'That Professor knows best himself (perhaps better than his patients) whether the astonishing virtue of his pills be a fact or fiction. But what one calk "puffing" another may call preaching the gospel.' *Q.* 'What do you mean?' *A.* 'Are you a quack, my dear friend, when with a trumpet more earnest, though not so brazen, you proclaim aloud to all and sundry, "Ho! every one that thirsteth, come ye to the waters." Or is Isaiah a quack who put you up to the plan?' My friend mused a little, and then said, 'Ah! Doctor, I see you are right. Isaiah's "waters" can stand the test. There may be puffing in appearance without reality, and if your anticipations regarding sulphur be realized as a cure, it may be found a "great" one too.'

Another true friend, also a clergyman, said, 'The subject is important certainly; but, dear me! your hasty rushing into print has permitted some offences against good taste, that disfigure your pamphlet very much.' *A.* 'Another edition may yet show such stains "rubbed out in the washing." But your own sermons sometimes tell us the folly of paying undue heed to the tithe, mint, and cumin of things. Please, reverend sir, attend you to the weightier matters of the law. Luther's doctrine was not the less important, though he might sometimes preach with a pimple on his nose, scarcely worth the criticising.'

Then there was my style—'pith without polish,' or, as some editors called it, 'inclining to the jaunty.' *A.* Can the medical profession not be roused to its duty by anything short of a solemn sermon? Would it really have

been seemly for an obscure individual to have assumed the serious, and lectured as a dominie Professors at whose feet he had often sat to receive instruction? Are our noble, disinterested, and philanthropic High Priests like the silversmiths of Ephesus, who manufactured idols for Diana's shrine? Surely not. Let their attention be only called to the matter, let them only know of it *in any way whatever*, and the work is done. Unfortunately, Dr. Dewar's calm, chaste, and sober style has been tried already, and, to some extent, been found wanting. With less flourish of trumpets than mine, his truly valuable and interesting pamphlet has been before the world for months; but instead of convulsing Britain to its centre, not till my pamphlet cordially saluted it, like two stranger country doctors shaking hands together without the formality of an introduction, did the system of sulphurous acid medication make any appreciable change in our treatment of disease. The mission of my pamphlet has certainly been accomplished, if it has aided in pushing into wider circulation its senior brother, which, sooner or later, must have found its way, by its own merits, into all the libraries of the profession.

Though not anticipating the great circulation which my poor extemporized *brochure* has attained, I knew very well that with Mr. Christison's name (itself a tower of strength) adorning its title-page, and the honoured names of Drs. Begbie and Douglas showing countenance in the background, it could not fall stillborn from the press. I knew, moreover, that some earnest men throughout the country, attracted to the pamphlet in the first instance from motives of personal friendship to myself, were likely to discover from its important subject matter, that in taking my little production by the hand they were promoting the interests of humanity at large. Not that they could solve its problem for themselves (except by reasoning from facts like other people), but could see the importance of its being solved by somebody. But who could have anticipated that such eminent men as Dr. Lyon Playfair and Dr. Joseph Bell (both total strangers to its author) should have furnished it with such magnificent wings, to aid its flight into dignified quarters that its own lightness or volatility never could have reached? To all such kind, unexpected, and highly valued friends, though acting no doubt chiefly on public grounds, as haters of epidemics and lovers of man, the profoundest gratitude of the author is due. The further prosecution of this important subject is now committed to the physicians of our hospitals, and Gamaliels of great authority in the profession. But in view of what has been already accomplished, it is not presumptuous to admire the usual plan of the providence of God, in educing great things from small. As microscopic fungi are the messengers of God's wrath, and, at His bidding, may lay a continent waste by pestilence; so sulphur may yet be found the panacea furnished by His goodness to arrest its march. And it is quite in keeping with such a mode of working, that to disseminate this truth throughout our land, He may first call on one country doctor to proclaim it; then another country doctor to back him up, who, ignorant of the opinion on the subject of any medical man in the world, had honesty to form his own conclusions, as well as nerve to cry out with boldness, arising from the consciousness of discovered truth. Dr. Dewar having the great merit of originating this system, his more slowly growing pamphlet has the stamina of the oak, and deserves to live. Mine, on the other hand, having served its end, can afford to die; a little medical 'fungus' at the best, rapid in its growth, likely soon to perish, and whose literary merit is a speck barely visible to the naked eye.

R.P.

BIGGAR, 23*d Nov*. 1867.

The Great Sulphur Cure.

(*A Free and Easy Letter to the* REV. J. CHRISTTSON, A.M., *Minister of Biggar*.)

REV, SIR,—Believing that you take a deep interest in the parish, I inflict on you rather a formidable letter, to tell you something of the new 'Cure' and new 'Machine' recently introduced among us, destined, let us hope, to play a deal of havoc with some of our diseases, and contribute to the health and comfort of the people.

The Great Sulphur Cure! What is that? That sulphur is the grand specific for a certain cutaneous epidemic, nameless and unassuming, hitherto grossly maligned and despised? Not at all. But that on the basis of this indisputable fact have been reared a theory of disease and plan of treatment, fitted (as some think) to make a revolution in medicine, and regenerate the world. Having recently put this principle to the test both of reasoning and experiment, my object is honestly to tell you the result. But first you may ask, How did I come to learn of it at all?

Well, though Biggar be situated midway between Edinburgh and Glasgow, that does not exactly mean the centre of the earth, but a retired nook of the world hid by Bizzyberry on the one side, and Tinto on the other, which important news of great events transpiring in Kirkcaldy may take a time to reach. In the centre of civilisation just named lives a certain innovating 'James Dewar, Esq., M.D.' which means, I suppose, a plain country doctor like myself. Like some of his tribe, this gentleman presumed not long ago to issue a pamphlet by way of instructing the world how to cure diseases. A van-driver of our district, whose uncommon knack of fishing out all sorts of strange and funny books, from both sides of the Atlantic, is quite commendable,

happened to get hold of it; and after passing through various hands it came to me; a dirty, soiled, unpretending-looking thing, with some such title as 'The Curative Powers of Sulphurous Acid Gas.' 'Pshaw 1' thought I, 'what has a little man like that got to say on cures? Sagacious enough in one thing certainly; to give his curative gas as high-sounding a name as possible. Such a splendid chemical term means neither more nor less than the common sulphur fumes emitted by a lucifer-match when burning, that we smook our bees with and whiten our wool. And though many an old wife has told me that sulphur itself is worth its weight in gold, all ages and genders agree in regard to the nasty fumes, to got out of their way as quickly as we can. Even the Bible itself represents Tophet and Gehenna as filled with them, to impress on us how fearful is the fate of the wicked in being compelled to breathe them!'

The truth is, having recently been asked to write for a popular journal a few papers on diet, as it so happened I was scribbling over at the time the last of the series, entitled 'Stone Broth; or could the Millennium be ushered in by Pills?' And as nobody would like to have the quality of his 'broth' contaminated by sulphur, it was very natural to neglect the pamphlet. 'Can the van-driver expect me to awaken from my alluring celestial dreams by such a mundane, paltry, stifling thing as a sulphur smell?' The Millennium, however, being duly ushered in to my own satisfaction and the happiness of the world; in the very year 1867 too, as all the minor prophets from Dr. Cumming downwards confidently predicted; ushered in, alas! *only in a dream*, I then seriously perused the pamphlet. 'Pipes and tobacco! what is this?' was my first sensation of profound astonishment. 'This country doctor has ushered in the blessed era already, not in a dream, *but in downright reality*, in Kirkcaldy at any rate! A valuable and amazing pamphlet altogether, or rather "Millennial Harbinger," whose good news of deliverance to an afflicted world have been as much neglected by myself and others as Matthew's Gospel!' For what is the purport of all its doctrines? That a potency lurks in common sulphur which philosophers and physicians, statesmen and divines, to say nothing at all of lucifer-match makers, little dreamed of. That to sulphur fumes, as a curative measure, almost nothing in the shape of disease ever comes amiss; stifling into silence any great epidemic raging in the earth, as easily as they can stifle a roaring vent. Armed with this weapon, the magician, Dr. Dewar, cares not a penny whether called on to fight a chilblain or the rinderpest, to clear a hen-roost or choke the cholera: epidemics of all sorts and sizes, high or low, cattle or human, anything you like, 'It's a' ane to Dandy!'

In other words, that sulphur fumes are infallible in killing the poison of cattle-plague, pleuro-pneumonia, cholera, diphtheria, nearly all ulcerations of throat or windpipe, fever, asthma, asthmatic bronchitis, croup, perhaps consumption itself, glanders and greasy heels in horses, etc.; in fact, all zymotic diseases whatever; to say nothing of such trifles as chaps, chilblains, common colds and influenzas, hoarseness, sores of all kinds, skin eruptions, horses' hacks, that pest of mothers the 'snifters' in babes, etc. etc. Further, that these fumes, condensed by water into a liquid form, can be injected into human lungs and windpipes by a magical machine called a Spray-producer, and produce the most astonishing results, sometimes almost in the twinkling of an eye!

I am sure, Rev. Sir, you will agree with me by this time that the subject is important; that instead of a mountain in labour bringing forth a mouse, the process has been reversed. A little scribbling country mouse has brought forth a mountain—a mountain too of prodigious size. In the light both of reason and experiment, let us attend for a little to this medical 'mountain,' this Etna or Vesuvius, by whose lurid flame and suffocating fumes it is proposed to fumigate the world, and clear the earth of all its plagues.

Reasoning.

Reflection I.—Is this man a crazed enthusiast, or a designing quack, or a rational being, who reasons like a philosopher, and details his cases like a medical man? Not an enthusiast certainly : for he proclaims his important message to the world with a seeming indifference perfectly distressing, and which would be highly reprehensible too, did we not remember that many pious doctors of divinity deliver a message of even greater weight, in a manner which suggests, 'There is the truth for you; believe it or not, as suits your fancy;' and that even the four Evangelists tell the story of their still more astonishing cures with equal coolness. Neither is he a quack : for with an honesty rare in such a tribe, he candidly confesses that some patients, far gone in consumption before the treatment began, actually died; that others took a whole week before showing decided improvement; that a third was only cured *minus* one lung, and though quite fit for ordinary work, had to pant and struggle when put to much exertion, like a man with a wooden leg hobbling at a race!

Reflection II.—Is his logic good? For my part I can find no flaw in it. To a non-medical reader it may appear surprising what similarity can exist between a horse's greasy heels and small-pox, or common 'itch' and Asiatic cholera; or what curious logic implies that if sulphur be a grand specific for the 'itch,' it should be equally infallible for cattle-plague, cholera, diphtheria and the like,—all resembling that humble eruption, he may think, in no earthly respect whatever. This, however, is a great mistake. If any sophism can resist this reasoning, I know not where it is to be found. For however these diseases may differ in some trifles, the grand

essential point remains, that *they all alike take their origin from a parasitic source*. With less fatality, and less flourish of trumpets in some than others, the common parentage of all is minute microscopic living things, vegetable or animal, that grow and breed like other creatures. Diphtheria is as surely a French mushroom, vegetable and alive, as anything of the kind ever kicked aside by a human foot. *Ergo*, if sulphur kills or cures one parasite or fungus, why not another? The same poison which destroys a wasp is very likely to kill a flea. Thus the respectable and maligned malady, 'the itch,' promises to become the greatest instructor in the whole theory and practice of therapeutics which the world has ever seen!

Reflection III.—The rapidity of his cures rather strengthens this logic than the reverse. In some diseases it matters little whether their duration has been ten days or ten years. If the cause be a living thing, kill the cause, and the work is done. At first sight it does seem strange that an obstinate skin disease of some years' duration should disappear in a day or two; or that a pleuro-pneumonia, whose cannibal jaws had never lacked a good repast for a single month during eight or ten years, should be cleared from a byre, apparently for ever, in fifteen minutes.

Witness the following from Dr. Dewar's pamphlet:—"Over pleuro-pneumonia, too, it would seem to enjoy an equal power of extinction. A large dairy in this immediate neighbourhood has, I have been informed, for nearly thirty years maintained a notorious character for mortality among its cows. The present tenant, during his occupancy of about eight years, had never been, up to the 1st November 1865, *one whole month* without having this disease among his stock; and within twelve months of that date he had buried sixteen cows, the last of these only *three* days before he began to fumigate. From that time till now his byres have been perfectly healthy. Another farmer told me last week that, after having been nearly ruined by deaths among his cows, he began daily fumigation, which he still keeps up He has not had a sick one since."

To a logician like Dr. Dewar this is not more surprising than that a man eighty years old should be as easily murdered as one of twenty. Though certainly his theory (apparently indisputable) of the essential similarity of all such diseases, high and low, sometimes leads to a novel jumbling of cases rather ludicrous. After due instructions on the way to clear rinderpest from a county, the next sentence may probably be how to manage a chilblain on the little finger. And in the midst of some thrilling pathetic stories about poor wasting human beings, snatched from the very jaws of consumption,—just as the reader is in the act of shedding tears of sympathetic joy, most opportunely may come a 'case' to dry them up again of 'a valuable turkey cock.' whose prospects its lady owner thought 'very desperate,' in spite of all the skill which could be brought to bear upon his illness,' being speedily restored to blooming sanity by similar means! The pamphlet is nothing the worse of this. Even a dwining hen, in testifying her gratitude for returning health, may cackle a lesson how to deal with a dwining boy.

Reflection IV.—May not some enigmas and curious freaks of chest diseases generally be explained on this principle? Look at asthma. A fit of asthma, of some days 'or weeks' duration, may come on *in a moment*, from various causes, nervous and stomachic; but very usually from the patient venturing into a dusty barn, smelling a little musty straw, entering a bedroom while the bed is being made, etc. Thus minute and invisible particles of organic impurity evidently get into the air-cells, and while sticking there produce their poisonous effects—aye and until gradually dissolved by gross expectoration clearing them away. By a change of air the cure of these attacks is sometimes as sudden as their invasion.

Illustration.—The lady of a colonel in the British army was once residing at S——, whose pure atmosphere and well-aired house seemed sufficiently salubrious. An attack of asthma came on so severe as to resist all treatment. In a fortnight she was reduced to such extreme weakness and difficulty of breathing, that, thinking she must die, I ordered, as a last resource, instant removal to Edinburgh, where she had been accustomed to breathe freely. This was resisted for several days, on the ground of utter weakness and inability for the journey; but matters getting worse, and death almost certain at any rate, at length she was lifted from bed into a carriage, conveyed to Thankerton Station, and thence to Edinburgh. While half-way to Edinburgh she was breathing as freely as ever in her life! and though still weak, never needed any further doctoring. Could the sulphurous smoke from the engine, especially in passing through the railway bridges, not partly account for this?

Second Illustration.—I have repeatedly had asthmatic patients who could not stand the pure and salubrious air of the country, but could always breathe with freedom in the very heart of smoky London. This used to astonish me. But may not the sulphur in the coals explain it all? The smoke of a large city is not so bad a thing as we have hitherto supposed. What with one disinfectant in the shape of *carbon*, and another in the shape of *sulphur fumes*, it is nothing but a great vapoury sheet spread by a kind Providence as a protecting mantle over the inhabitants, but for whose benignant influence, fever, plagues, throat and lung affections, might riot more abundantly than they do in such congregated masses of human beings.

Third Illustration.—Dr. Halliday Douglas mentions a case of a consumptive gentleman ordered by his London physician to Wales for change of scene. He could breathe freely only when the wind happened to be in a certain direction. This was at first a mystery, until it was discovered that the health-bringing wind from that

direction had to blow over some large 'smelting furnaces' before it reached his dwelling.

Reflection V.—It is perfectly certain that many diseases—fevers, for example—originate in an impure state of blood. The blood has received a dose of poison, which is supposed to multiply itself and work in that fluid after the manner of a ferment. More than twenty years ago I used to sigh for some medicine which, by entering the blood, would destroy that ferment, and frequently mentioned the thing to my friend Dr. Smith, as the one great desideratum of our age. Even consumption itself is a blood disease of this nature, originating in that vital fluid, existing there, perhaps, for years, till, by some causes being fomented into power, it finally localizes itself in the lungs and bowels. Well, why (without experiment) should it be considered nonsense that sulphur fumes should have some virtue in incipient consumption, or some virtue in fevers especially, if morbific germs be fermenting in the blood, when, for anything we know, sulphurous acid may arrest fermentation *within* the body, similarly to what it can do *without?* That all *sulphites* have this action is a well-known truth, whether Pasteur's notion be illusory or no, that fermentation is essentially a breeding of countless parasitic germs. And what is a sulphite but sulphurous acid (*i.e.*, sulphur fumes) united to a base?

What confirms me in this idea, is an announcement in this present month's number (October 1867) of the *Edinburgh Medical Journal*. In an article extracted from a Jamaica newspaper, we find an eminent physician, Dr. Alexander Fiddes, proclaiming to the whole profession, that in their future treatment of yellow fever (so excessively fatal in that island) they must throw aside their calomel and quinine, etc., and confine themselves, in the way of medicine, to a dose of castor-oil to begin with, and then twenty-grain doses of the *sulphite* of soda, potash, or magnesia, every two or three hours. Apparently, without any knowledge of what is transpiring in Kirkcaldy, he attributes all the virtue to the sulphurous acid saturating the blood, destroying the ferment, and cutting short the fever; and then adds, that the astonishing results of this plan of treatment he will shortly prove to the profession by abundance of statistics! *Query*, If these sulphites turn out the most effectual way of dealing with yellow fever, why not equally with small-pox, scarlet fever, rheumatic, typhus, and many other fevers and diseases supposed equally to arise from poisoned blood? Truly, all ends of the earth seem conspiring to proclaim the duty of testing and attending to the 'great sulphur cure.'

Induced by all such considerations, I resolved to bring this plan of cure to the test; and without being acquainted personally either with Dr. Dewar, or any medical man in the world, who, to my knowledge, had tried it, I felt it something like a duty to solve the problem for myself; determined to proceed gently and cautiously at first, to feel my way by slow degrees, and in no instance thoughtlessly to tamper with human life. Why should Biggar be behind Kirkcaldy in anything? As for me, if I cannot starve my patients into health by gruel, fatten them into it by cod-liver oil, or poison them into it by a multiplicity of drugs,—why not choke them into health by sulphur fumes? My first experiment was tried exactly this day month (10th September), with some expectations of good results even from theory alone, but not without a shrewd suspicion that Biggar air or Biggar bungling would not quite come up to the mark of Kirkcaldy.

Experiments.

The subject having now assumed a very serious and practical phase, I beg to assure you, Rev. Sir, that in what follows I write with all the care and caution that matters of human life and death require. I will tell a plain and unvarnished tale, not consciously exaggerating in one point or another, but confessing failure where it happened, and wishing only to reach the truth; fully more anxious, indeed, to detect flaws in this new curative measure, than unduly to extol it. My responsibility is great in writing on such a subject at all, either in the way of condemnation or approval. For without supposing that my opinion can have much weight in other localities, it may easily be imagined without vanity, that a gentleman who, in a twenty-eight years' practice in Biggar, has acquired many kind and valued friends, can scarcely express any medical opinion at all, without its having some weight in our own district at any rate.

CASE I.—*Gastric Fever*.

On the 8th September 1867, I was called to see Miss——, residing at——Cottage, Biggar. I at once pronounced the case gastric fever; and in two days it was very decidedly so. No delirium; but severe headache, requiring leeches, cold applications, and shaving the head. The most prominent symptom was distressing cough. But what gave me chief concern was the state of the tongue; very clean, very dry, and very red, indicating (as I thought) a tender state of mucous membrane, and the probability that obstinate diarrhœa would accompany the case, one of the most usual as well as alarming symptoms of gastric fever. As gastric fever of a bad type (as I was informed, and where it was supposed she must have caught the infection) was prevailing at the time in the two adjoining houses, and had already prostrated several of their inmates, on the second day of my attendance I ordered some chloride of lime as a disinfectant. 'Please, Sir,' was the reply, 'we do not know

how to use it. Will you bring it yourself the next time you come down?' On my next visit the question was put, 'Have you brought the lime?' 'Dear me!' said I, 'I have quite forgot. Never mind : have you any sulphur in the house?' 'No; but it could easily be got.' I then took a kitchen-shovel, put on it some live coals, and laying the shovel in the middle of the floor of the sick-room, sprinkled over it half a tea-spoonful of sulphur.

Experience soon taught me a slower and better mode of burning the sulphur, without live coals (see in Appendix, 'How to Fumigate.')

This producing no irritation to the patient's lungs, I added a little more sulphur, when she began to cough a little. The inmates being surprised, asked if these fumes would not increase the cough. I answered, that to relieve the cough was one reason of my doing it, as well as to keep the air of the sick-room sweet and pure, whereby I hoped both that the fever would be mitigated, and they themselves escape the infection; but at the same time honestly confessed that I had never tried the experiment before; I was only acting to the best of my judgment; if they had the slightest objection I would not persist with it. The answer was, 'What-ever you prescribe shall be implicitly obeyed.' The same fumigation was adopted twice a day during the whole of the fever; and the following was the result (but whether owing to the fumigation or not it would be rash to say) :—1. The case turned out extremely mild, though expected to be severe, the patient getting the turn about the tenth or eleventh day, and the subsequent recovery remarkably rapid. 2. No bad symptom ever supervened, not even diarrhœa, except a very sharp purge from less than half an ordinary dose of castor-oil, showing the tender state of the mucous membrane. 3. In the course of three days or so the patient's cough left her entirely, except when the fumes filled her bedroom, and no cough mixtures or mustard blisters were given to relieve it. 4. None of the inmates (consisting however of only two other individuals) took the fever. The household are under the impression that the fumigation did good both in quieting the patient and relieving the cough, and would certainly call for fumigation again, were any of their number prostrated with fever. *Practical Remarks*.—Contrary to my expectation this fever might have proved of a mild type (independently of the fumigation), though I scarcely think the cough could have been relieved in such a rapid manner. I only draw from it this conclusion, that fumigation is safe, even in a sick-room, if cautiously applied.

CASE II.—*Diphtheria, etc.*

Conceiving this conclusion to be just, I soon tried the power of the sulphur cure in several other cases as they occurred in practice, including two of mild scarlatina, several of hoarseness and common colds, sores and skin diseases, bad coughs of long standing, begun consumption, etc. etc. Most of these cases I dismiss very summarily, for two reasons—1. Because to detail them all would require a large volume instead of a letter; 2. Because having conceived the idea of writing about them only a few days ago, I took no notes of them at the time, and by trusting to memory might fall into blunder. I can safely say this, however, that with one exception (to be mentioned hereafter) in no instance was any harm produced; in some there appeared to be decided good. The only *serious* case of the whole (except consumption), the only case I mean threatening an immediate danger of life, was a very bad case of diphtheria in a young, delicate girl, in whom the throat affection had proceeded to a great extent before either the sulphur treatment or any other treatment began. I treated this case with the sulphur fumes, because my spray-producer had not yet come to hand. I was seriously alarmed for this girl's life on my first visit, and ordered the fumes to be carefully persisted in, not indeed expecting that they could choke or kill such a large throat mushroom (as we may call it), rooted and fixed on both tonsils, but in hopes that they might prevent the disease extending to the windpipe. My candid opinion is, that these fumes did good, perhaps even saved the girl's life. Yet, honestly speaking, this is a mere opinion or impression, destitute of decided evidence. Indeed, I cannot positively affirm that they did any good at all, for the following reasons :—1. I have seen cases fully as bad recover under the ordinary treatment, though, generally speaking, such cases are very apt to die. 2. Along with the sulphur fumes all the ordinary treatment was conjoined, caustic, chlorate of potash, Condy's fluid as a wash for the throat, wine, beef-tea, etc. etc.; and what was due to the sulphur, or what to the other remedies, it is impossible to say. 3. The great point is, that the patient, on the whole, made a good recovery; and especially, while no other disinfectant was employed in the house, *no other member of the family* (consisting of four persons) *caught the infection*. To show that they were as liable to infection as other people, I may add that they have only one apartment; and, a few months ago, one of the children having caught scarlet fever, the other two children, as well as another in the next dwelling, caught it too, whereof one of the children died.

But it behoves us now to proceed a stage, and say something of the New Magical Machine or Spray-Producer, since obtaining which I have jotted down some notes of such cases as appeared either interesting or instructive.

CASES III., etc., *or a Jumble of Trifles, Odds and Ends*.

1. *Horses' Hack*.—On October 5th, my second son, Adam, came to me saying, 'Papa, the black pony is lame!' 'Lame!' said I, 'I never noticed any lameness about it.' 'Oh yes, it has been a little lame,' said he, 'for several mornings, when I take it out to water; but I think it is all owing to a "hack."' Sure enough, on examination, there was a hack on one of the forelegs, scarcely half an inch long indeed, but discharging matter, and quite enough to account for a trivial lameness. I caused him to cut off the hair, give the part a good washing, and then dry it well. I then applied one drop of the liquid sulphur (or condensed sulphur fumes, called sulphurous acid) taken from my spray-box. 'Now,' said I, 'we must apply this regularly morning and evening. I wish to see whether this, or our famous zinc-salve, be the quickest healer.' Next morning I lifted the horse's foot, phial in hand, to re-apply it. The hack was healed! the lips of the sore still gaping a little, but perfectly dry, and not the slightest trace of matter. The pony was never more heeded for several days, but constantly trotting through 'dub and mire' as usual, when I had the curiosity to lift the foot again to look at the hack. Nothing was seen but a little dry scurf, which I picked off with my nail.

Remarks.—Will grooms call this cure a trifle? Very doubtful. Is it really a trifle? As a cure of a sore, it may be so; but as a means of teaching physiological truth, it may yet turn out the most important discovery within the whole range of veterinary science. If 'itch' and 'hacks,' in point of origin, have a common parentage with cholera, diphtheria, rinderpest, glanders, etc. etc.; if a touch of sulphur cures both of such trifles in a twinkling; who can yet calculate what may be its effect in dealing with the various destroying angels that afflict the world?

Excoriated Nipples.—Some two days after this, a lady patient of mine, nursing a baby at the time, sent in to me one of my 'Nipple Lotion' bottles to be refilled with the same precious fluid. This 'lotion,' I may mention, is a stuff that has been prepared at my laboratory for years. And such fame did it acquire for the purpose intended (generally healing such sores within a week), that not only my own patients in this district, but ladies from all parts of the country (from even many miles beyond Glasgow) used to send for it. I positively believe, had I taken out a patent for it, my fortune might already have been amply made. Alas! Dewar, I owe him a grudge. I fear he has given my 'lotion' a death-blow. With a trembling hand, shrewdly suspecting what might be the result, instead of refilling the lotion bottle, I gave a few drops in a phial of the liquid sulphur, with the remark, 'Try that instead.'

It was only yesterday that I heard the result. The nipples were healed at once. 'By how many applications?' said *I. A.* 'Either by one or two, I forget which.'

Common Cold and Hoarseness.—On Saturday last, the 5th October, at 4 P.M., I was called to a house in Biggar to vaccinate a baby. While *performing the operation* (if vaccination can be called by such a grandiloquent term), in steps Miss——, the eldest daughter, all muffled up like a person under cold, and speaking hoarsely. Some five or six persons were present, who can speak to the truth of what follows. *Q*. 'How long have you been affected with cold, Miss——?'—*A*. 'For a whole week.' *Q*. 'Have you had a cough all the time?'—*A*. 'Yes, and quite stopped up in the nose.' *Q*. 'And always been as hoarse as that?'—*A*. 'Just much the same. '*Q*. 'What will you give me to cure you in three minutes?' Great laughing and merriment at this proposal from all present, and a question from Miss——, 'How do you expect to do that, pray?'—*A*. 'Never mind; leave that to me. I undertake to do it, if you will only sing to me one verse of the Hundredth Psalm, to the tune of "Old Hundred."' The idea of singing in her hoarse condition only added to the merriment; but I wished to try the effect of the spray on the vocal chords of the human larynx, and insisted on my fee. This being agreed to, her brother went down for the instrument, which had arrived the day before. She had only finished one line of 'All people that on earth do dwell,' when I cried 'Stop! stop! you have given us plenty of such wretched singing. I take you all to witness what a harsh "roupit" voice this lady has.' I then gave several whiffs into her throat, telling her to inhale her breath while I did so; and concluded by a similar operation first to one nostril and then the other. Immediately afterwards I said, 'Well, how do you feel?' 'A little choky, I think,' was the answer. 'You are certainly speaking better at any rate,' said I. 'Are you still stopped in the nose?' To the amazement of herself and all present, the stopping of the nostrils was completely gone! 'Now sing,' said I, 'other two lines of the same Psalm.' She sang two lines in her usual sweet, clear, and musical voice, almost fit for a concert! To all appearance I had fulfilled my promise, only instead of taking three minutes to the task, it was done in a sixth part of the time!

This took place on Saturday at 4 P.M.; the case being nothing at all dangerous, and its cure only undertaken as a piece of pleasantry, I never intended to pay another visit. But late on Sunday night I had to see little baby Ovens beyond the toll-bar; and my friend, the father of the child, accompanied me home to take up some medicine. Having told him this story on our way down, Mr. Ovens was so surprised at it, that we both agreed to call at Mr.——'s in passing, he to inquire if the story was not exaggerated, and I to see if the cure had been permanent. To my disappointment, I found Miss——still a little hoarse, but nothing at all like the previous day. On expressing regret to find her cold not yet entirely gone, she said, 'The truth is, Doctor, I have myself to blame for it. I kept perfectly well the whole afternoon and evening, but late at night went out without any shawl on me. It was foolish, certainly, *but I quite forgot that there was anything the matter with me*. That may be one

cause of the slight hoarseness; another may be that I have been at church to-day, both forenoon and afternoon.' And an intensely bitter cold day it was. 'And what about the cough?' It, too, was greatly better, notwithstanding the two exposures already adverted to.

CASE IV.—*Cold and Hoarseness—Warning about Asthma*.

One of my earliest trials of the sulphur fumes was made upon a gentle- man of wealth and high position in society, residing in one of the mansion-houses in our district. The case is hardly worth recording, but for the lesson it teaches, or warning rather; a warning which Dr. Dewar's own pamphlet rather ignores. I had been attending one of his girls for a cold of long continuance, and had been giving the ordinary medicines, ipecacuanha wine, etc., with little benefit. One morning I received a message that the gentleman himself was affected with cold, and in bed; I had better call to see him. I found that he had been ailing for a week, was rather hoarse, but had scarcely, if at all, any cough. The proper treatment should have been by spray or an inhaler, but as yet I had not received the instruments. I suggested and explained to him the sulphur cure, to which he consented, though his lady consented with great reluctance. It so happened that a stranger gentleman and his wife were on a visit at the time, and great curiosity being excited to witness this strange medical innovation, this stranger gentleman said to me, 'I am anxious to witness the performance too, but dare not. I am a great martyr to asthma, and am almost certain it will bring on an attack. At present I am perfectly well, and won't risk it.' I assured him that it was recommended as the best cure for asthma yet discovered; that in Kirkcaldy it was a regular domestic institution, practised by all and sundry to preserve health, as well as cure disease; that as a tonic it was there superseding steel and cod-liver oil; and that even the scholars in the various schools were fumigated several times a day (according to Dr. Dewar), with the happy result of both improving their health and sharpening their intellects, by keeping the air always fresh and pure. Induced by my advice, the gentleman remained to witness the process.

While the room was filled with fumes, I caused my patient in bed (for lack of a suitable inhaler) to inhale now and then the steam of hot water from a jug. The steam and sulphurous acid fumes uniting caused a sort of artificial spray, identical in chemical composition with the spray of the instrument. Very soon the asthmatic gentleman rushed out, saying, 'I have had enough of it.' Shortly after, the two ladies. The children began to rush out too, but I hold by force my young patient, little Miss. I kept the room filled for half an hour or so, with nobody present but the patient, Miss, and myself. And in reflecting on it now, I think probably more sulphur was used than there was any occasion for. On leaving, I said, 'I positively think, Mr.——, you are speaking better already.' I then told him, and he promised, to repeat the process at night. 'I will call again tomorrow morning,' said I, 'not that you are so bad as to require a visit, but simply that I would like to see how you are.' On my next visit, I found Mr.——going about the house apparently well, and little Miss's cough better than it had been for weeks. But they had not repeated the process at night. I asked the reason. 'My wife,' said he, 'would not hear of it on any account. Besides, I was better at night, either with the medicine or fumes, or both together, and did not need it.' 'But for the sake of little Miss,' said I, 'you should have done it.' I then asked to see his lady, and recommended another dose to Miss. The only answer was, 'Oh! those nasty fumes, I won't submit to another trial.'

It struck me as rather odd that a lady, who always appeared to have the utmost confidence in her medical adviser, and had obeyed his advice most implicitly before, should prove refractory after seeing the good results of a single trial. But there was a reason for it all, an enigma that I got explained only yesterday (10th October). The occasion was this :—Yesterday morning I was called to see the gamekeeper of this family by the lady's orders. Understanding that it was a case of sore throat, I took my spray-producer with me. The gamekeeper had been ill with ulcerated sore throat for several days (the effect of cold and bile), but by good treatment, such as mustard-poultices, blue pills, etc., he was greatly better, and probably would have been quite well to-day without any more ado. All that remained was a slight degree of tenderness of throat and difficulty of swallowing,—to relieve which, I gave him a few whiffs, with the view of hastening his cure twenty-four hours or thereby. The man immediately said, 'My throat is perfectly right; I have neither pain nor difficulty of swallowing.' This was rather too good not to let the lady know all about it, by way of retaliation for her former sneers against the sulphur cure. So of course I called just by the bye; I knew the lady would be anxious to know about the gamekeeper. In answer to the question, 'How is the gamekeeper?' 'Oh! quite well,' said I. 'One minute before I called he was complaining a good deal of his throat; the next minute I had it all right.' 'Indeed!' said she. 'How did you manage it so quickly as that?' *A*. 'By the sulphur cure, to be sure, which you despise so much.' In uttering these words, there possibly might be the slightest approach to a twinkle of triumph, not easily avoided. It could not, however, amount to rudeness; for she immediately told me with the greatest kindness and good-humour what was her objection to the sulphur fumes. 'I am perfectly conscious,' said she, 'that my husband was the better of them, and Missie too,'—'Yes, I was,' cried Missie,—'but do you know. Doctor, they

brought on the stranger gentleman such an attack of asthma, perhaps the worst he ever had in his life. He got no relief till the afternoon, nor complete relief even for several days. I would not for the world have allowed a puff of them again while he was with us.' After recovering somewhat from the mingled feelings of sorrow, shame, contrition, and surprise with which this announcement overwhelmed me, I asked, 'Why did you not tell me this before?' *A*. 'I tell you it even now only from a sense of duty to put you on your guard. The gentleman was so satisfied that you acted from kindness, and to the best of your judgment, that he begged of me not to reveal it lest it might hurt your feelings.' After thanking her most cordially for such an act of kindness, I begged that she might allow me to make use of this case as a warning to others—a favour which she allowed very reluctantly, and only on my telling her that I was collecting notes about this cure, and putting it on its trial. 'As an honest man,' said I, 'I wish to probe it to the bottom, and find its flaws as well as merits. Hitherto, the only fault I have ever detected about it is, that it does not invariably come up to expectations. But this is a very serious matter.'

Remarks on this Case.—Though I have never yet tried the sulphur cure in asthma, this case appears to me a striking demonstration (so far as mere reasoning can prove it without trial), that in asthmatic attacks mild sulphur fumes will operate like a charm.

This reasoning has since been verified by direct experiment in many cases. But great caution being required in asthma, its treatment should never be undertaken by non-professionals without medical advice.

How so? Because, wherever the seat of asthma may be, sulphur fumes act on that seat, and therefore must stimulate it when in a state of disease. For an inflamed eye, one never would apply a lotion to the nose, but to the eye itself; and the lotion, to be effectual, must be of such a strength, that, dropped into a healthy eye needing no stimulation, it would raise inflammation in it. In like manner, for the cure of liver complaint, nothing can be expected from any medicine that acts solely on the kidneys, but from something that acts directly on the liver itself—calomel, for example. Yet a huge dose of calomel in a healthy person would infallibly induce a species of artificial liver disease, just as this gentleman had inadvertently raised in him what we may call an artificial asthma. This is the sole secret of the maxim *similia similibus curantur*, just a plain common-sense truth, on which so much nonsense and quackery have been raised.

Practical Conclusion.—Persons of weak chests, if quite healthy at the time, should not needlessly expose themselves to fumes unduly strong; and from reasoning alone, I confidently predict that patients with a cough will stand a stronger dose of them *without coughing being excited*, than people in health with no cough at all. 2*d Lesson*.—As a curative measure, long continuance to mild fumes is safer and infinitely better in every way than a shorter exposure to stronger fumes.

CASE V.—*Very serious Case of Inflamed or Ulcerated Windpipe and Pharynx*.

I am detailing these cases not at all in chronological order. Beginning with trifles, we come now to something of a more serious nature, and possibly may get to consumption by-and-by. When this case occurred, I had only as yet tried the sulphur fumes; but intending to operate a little on human windpipes, I had sent a few days before for a Spray-producer. Knowing well that human windpipes, throats, and lungs were tender, delicate, and sacred things, I regretted much that, with the sole exception of Dr. Halliday Douglas, there was no doctor, so far as I knew, to whom I could apply for guidance and instruction, and with Dr. Douglas himself I was not personally acquainted. But reasonably enough concluding, that if the physician of Chalmers' Hospital was like the other principal Edinburgh physicians, he was not likely to think it any breach of etiquette for an unknown country doctor to ask a few important questions, I wrote a letter, being sure of a civil answer at any rate. The answer was couched in not only civil and polite, but kind, almost affectionate, terms; its purport being an encouragement to proceed with my experiments; and though not yet in a position to give a *decided answer* in regard to consumption, with other diseases of throat, chest, and windpipe, 'like yourself I anticipate good results,' etc.

The instrument arrived twelve hours earlier than the letter; and, curiously enough, it was not ten minutes in my possession till the following case, as if sent by Providence on purpose to test it, afforded a striking proof of its power :—On Friday morning, the 4th October, while (in consequence of a midwifery case during the night) I was still in bed, an urgent message came to my house for me to visit *immediately* a gentleman holding a Government situation not far from here, said to be bad with a sore throat. Either through some neglect the message was not delivered to me as urgent, or, in consequence of my own sleepy brain, I did not hear it as such. Taking a nap first, I soon rose and set off to the country, quite forgetting the poor patient altogether. On returning at noon, another message came, conveying great amazement that I had never called, and a request that I would go at once, for he was in great distress. I found him in bed, looking miserable, and complaining greatly of pain in his throat. He had a fly-blister on a large swelling below the chin, painful to the touch, which I took to be a swollen gland, arising from the internal irritation, and likely to suppurate. On looking into the throat, I

could see nothing wrong with it. He then pointed to the windpipe and pharynx as the seat of pain. The history was this : the internal irritation had begun two months ago, probably in consequence of his business; one part of his duty being to spend two hours every morning *in an open gig* between a railway station and his office, viz., from five to seven; and two hours every night similarly exposed, from six to eight—the morning hours, especially at this season of the year, being decidedly the worst in all the twenty-four for windpipes even in a healthy state. Though slight at first, the pain and difficulty of swallowing had gradually increased, and become greatly worse for the last two days. Soon after the internal irritation began, a little swelling like a bean showed itself under the chin, which, keeping pace with the inward disorder, was, at the time of my visit, the size of an ordinary apple, but not so round. 'My difficulty of swallowing,' said he, 'is so great, I have never tasted a drop of water the whole night, nor tasted food this whole day; I cannot get over even a drop of tea.' I told him that his whole windpipe and throat would need to be washed out with an astringent gargle, and forthwith sent off for my newly-arrived instrument, fondly hoping it would 'make its *début* with great *éclat*.' Before injecting the spray I asked him to try one teaspoonful of cold water, which, with great difficulty and many grimaces, he succeeded in swallowing. I then gave him some twelve or fifteen whiffs of the spray, and immediately afterwards asked, 'How do you feel?'—A. 'I can swallow my spittle much easier at any rate.' I then put a teacupful of water in his hand. To my own astonishment, as well as that of his wife and himself, he gulped down several mouthfuls with the greatest ease! told me that the pain was almost if not entirely gone! and immediately added, 'Away, gudewife, and prepare some food; I 'm tremendous hungry!' I then told him to keep quiet in bed, and I would call at night to repeat the operation. On calling at night and looking into the bed, the bird had flown; he was engaged in his office, sorting some letters! I then asked his wife if his swallowing powers had managed a little arrow-root, or anything similar, since my last visit. Arrow-root! he had enjoyed two good hearty meals; one of them a *minced collops* dinner as usual. [*Note*.—Rev. Sir, in case you think me writing a sensation novel, please call at the office when that way, and ascertain for yourself that all this is strictly true. Were I writing a novel, I would never think of anything so extravagant.]

Next morning he was so decidedly better, I did not think it necessary to repeat the operation; told him all he would need was care and a dose of medicine. Even the size of the swelling had much declined, the internal irritation which had occasioned it being nearly removed. The weather being frosty at the time, and intensely cold, most unfortunately I carelessly neglected charging him to keep within doors; probably for the same reason as one might neglect to charge a fractured limb newly bandaged up, on no account to get up and dance a reel! This was all on Saturday morning. The next sight I saw of him was on that same evening, just at six o'clock, while beginning to get dark. On coming up from the 'Cadger Brig,' and walking fast to keep myself in heat (the night being bitterly and intensely cold), the Government gig goes whirring past me; and unless there was some great ocular delusion, to my great horror and amazement who was within it, but somebody (well wrapped up indeed, as the night and an open running blister on the throat required) as like my patient himself as could possibly be! In vain did I hold up my fist, and shake it in his face in a threatening manner, as the most eloquent and telling mode of crying, 'Madman! do you mean to kill yourself?' Her Majesty's mail was not to be interrupted by any such foolish menaces. Nor is this the worst. That was defiance to frosty air the second. Unaware of the danger, and conscientiously desirous to do his duty to Government, he had, unknown to me, risked the same exploit in the morning between five and six. Observe, Reverend Sir, the astonishing nature of this exploit. On Friday at noon, an inflamed or ulcerated windpipe or pharynx, of two months' duration, had come to the climax already described. In exactly seventeen hours thereafter he begins his usual open-air occupation at five o'clock on a cold frosty morning, because (as he afterwards told me by way of apology) *he thought he was almost completely belter!* a feat of daring, though conscientious, performance of duty, compared to which such paltry tricks as eating fire, or swallowing a huge naked sword (that used to make us stare so much of old) are perfect baubles. The fact that he ever thought of such a thing, says a great deal in favour of calling the Spray-producer a magical machine; and the additional fact of his coming home alive, shows that human windpipes may not be such delicate tender things as medical men declare. But you will not, I am sure, be surprised to learn that a serious and much more tedious *relapse* was the inevitable consequence.

Relapse.—Next morning (Sunday), a message came down for me to see the gentleman again, 'He was worse than ever!' But when that message came to my house I was beyond his reach, being on the borders of Tweedsmuir, engaged with a case of a different character. On returning at night I immediately called. He was indeed worse in every respect except one, the difficulty of swallowing being not quite so great as on the first visit. But he was hoarse, constantly hacking up immense quantities of phlegm and mucus; tongue remarkably foul; skin hot; pulse very feverish; the gland below the chin now a huge swelling from ear to car; the whole face also swollen, especially beneath the eyes; great difficulty of speaking at intervals; and though the difficulty of swallowing was not quite so great, it was very considerable. The patient had been waiting eagerly for my visit, expressed great joy at seeing me, and hoped I would give him the same relief as formerly. Conscientiously believing that if some patients must be starved into health, others fattened into it, etc., this one would need to be

frightened into it in the first place, I determined to inflict on him such a lecture as he was not likely to forget in a hurry. 'My dear hearer!' I began, 'this playing at windpipe-curing being rather a ticklish game, and this being Sunday night at any rate, you cannot be the worse of a serious sermon suitable for the occasion. I choose for my text those pithy words of the sixth commandment, "Thou shalt not kill." And before attempting to cure you a second time, would beg to preach from it a short discourse on the *ordinary way* of curing your disease when of two months' standing, etc., etc.' I then detailed in their order the leeching, fomenting, blistering, antimonials, and expectorants, confinement to a room the whole winter, reducing the system, then cod oil and iron to get it up again, the sighing for genial weather, cursing of east winds, etc.; to complete the cure, the change of scene, the disappointment, the medical consultation with some eminent professor, the professor's regret that after the very judicious treatment already adopted he can only suggest, etc. etc., and then the patient's *coming home to die*. I then concluded, 'This being the usual way of cure, I have to tell you, candidly and seriously, that not only may it possibly be your own, but for my part I see not the slightest hope of averting it, unless you co-operate with your medical adviser, and in right earnest begin to take care of yourself. Under any treatment whatever you must be confined to the house for a length of time. As for driving out in a gig at live o'clock in the morning, I tell you frankly that though you were well tomorrow, you won't be allowed to go into your garden except during the heat of the day, for the whole ensuing winter, without a respirator at any rate.' The patient being duly and deeply impressed with such an unexpected theological exposition, only mused a little without a remark, and then said, 'But what is to become of the Government work?' 'That,' said I, 'is a problem I have nothing to do with. Though all the governments of the world go to wreck, my mind is made up : either implicit obedience, or I walk out with my spray-box in hand, without administering another dose. For observe, my dear sir, paltry and insignificant as you seem to think your own life, not so in my estimation is the success or failure of my machine. You have been honoured by being made the subject of its first experiment, and it must have fair-play. The issue is momentous to me and my patients. Because if it can cure you, the rational conclusion is that it may cure others made of the same flesh and blood.'

The patient having come under all due submission, I then administered the spray, with the immediate effect of relieving at once pain, difficulty of swallowing and of speaking. The effect was not so striking as at first, partly because expected, and partly because the power of swallowing was not entirely lost. But the patient, of course, continued feverish and unwell in many respects, and was altogether or nearly confined to bed for several days. On Monday morning I found that all the throat symptoms still existed, though not so badly, and that the spray immediately again gave relief; but his general condition in no respect improved. I ordered warm poultices to the throat, and medicine for the bowels, and intended to apply the spray more frequently, say three or four times every day. Alas! for the uncertainty and mistiming of a country doctor's life! I never gave the spray again till Wednesday night, a whirl of business of different kinds preventing. I never once saw him on Tuesday at all, nor Biggar either, being tied the whole of that day to a bedpost at Castle Craig, and spending the time (for want of anything better to do) in beginning and nearly finishing this letter to you. A country doctor is the worst person in the world for such a work as I have taken in hand. Never did I more eagerly wish for a week of quiet and reflection to conduct these experiments, and write the result in peace and calmness, after due thought and consideration. Instead of that, the whole week has been a whirl of excitement with midwifery cases, spray injecting, writing letters to Edinburgh, Glasgow, Kirkcaldy, and I know not where; ploughmen half killed with their horses; sulphur burning, etc., etc. All this time attempting to reflect and philosophize, beginning this letter to you on Tuesday last at Castle Craig, writing snatches of it here, there, in all ends of the county, or at home, as I could find leisure, and taking great care amid all this excitement neither to diverge one iota from the truth, nor raise palpitation in my own person. Really, reverend sir, you must excuse many errors in writing, and offences against good taste, that would be very unpardonable in such a finished composition as usually emanates from your own study.

But to return to the patient. On Wednesday night I found his state not materially changed, and that for want of the spray he had taken my advice, and occasionally indulged in the inhalation of sulphur fumes conjoined with steam as a substitute. On Wednesday evening I put him into the hands of another doctor, seeing that this irregular visiting of mine would never give himself or my instrument a chance. This doctor, or rather young aspirant to the honour of M.D., not yet quite fledged, was my own son; who, being very proud of a first patient, was most attentive to his duties; and promised to administer a dose of spray four times daily, as duly directed. From that time till now progress has been forward, and on the whole satisfactory. I now write on Saturday at half-past two; so that he has now been under this treatment for three days. I stop for the purpose of visiting the office and giving the latest report.

Saturday, 12*th Oct.* 1867, 3 P.M.—Greatly improved in many respects. Pulse weak, but not so feverish; tongue clean; appetite a little better; complains of a stitch in the back; feels weak and sickly, partly from medicine in stomach which has not yet operated. Very depressed in spirits, because his throat is not so much better as he ex- pected; great hacking of phlegm; still some difficulty of swallowing and speaking occasionally,

which are always relieved after the spray. External swelling not above a third of its former size. I ordered for him light meals frequently repeated, half a glass of sherry three or four times daily, a large fly-blister over the larynx, and to continue the spray. My opinion is that the case is hopeful; but there being evidence (as I think) of ulceration in the larynx or pharynx, the case will probably be tedious. I leave a space in this letter to tell the result.

Monday, 14*th Oct.*—Ordered him yesterday to discontinue the spray, and keep a constant mild taint of sulphur fumes in his bedroom instead. To-day much improved in every way.

Wednesday, 16*th Oct.*—Since last report progress forward and satisfactory. To-day greatly better *in every respect.* Still the slightest degree of internal irritation and difficulty of swallowing. Still hacking up a little phlegm, which contains some streaks of blood (only seen today), confirming my notion of the existence of ulceration.

Friday, 18*th Oct.*—So nearly well that I may almost dismiss the case as cured. There may be some slight tenderness, and need to guard against relapse during the whole winter. But already we are talking of a respirator to let him out soon. *Note*.—I jotted down all particulars of this case from the beginning, resolved to tell the result, and expecting that result to be failure. My candid opinion is (after an experience of twenty-eight years) that this gentleman under all ordinary treatment would certainly have died; and that, should his recovery prove permanent (as it promises), he owes his life, under God, to Dr. Dewar of Kirkcaldy. *Note* 2.—Lest any reader may think this case detailed in a style too merry for the patient's feelings, I beg to observe that his own sanction has permitted me to tell his foolish exposure, Sunday lecture and everything. After all, how many of us endure needless relapses without such a good excuse as a strict attachment to duty, and eagerness to return to it at the earliest moment we think ourselves fit?

Note for Third Edition.—Nov. 13.—Continued gradually to improve. The external gland suppurated after all. Keeps quite well, and out in all weathers for the last fortnight, protected by a respirator.

Note for Seventh Edition.—Dec. 4.—Apparently quite well; has resumed his open air work at night: sometimes with a respirator, sometimes without.

CASE VI.—*Cough of nearly a Year's duration*.

A young lady in Biggar was seized in December 1866 with inflammation of bowels, complicated with pleurisy in the left side of a severe character. For three weeks or a month her life was nearly despaired of. She was confined to bed all winter, the effusion from the pleurisy being so great, that during all that time the lung gave a deadened sound on percussion, and from the constancy and severity of her cough, I greatly dreaded consumption as the issue. No remedies seemed to take much effect; but on the approach of good summer weather she greatly improved in every way. During the month of June the cough left her, or nearly, but began in July and since continued. All the ordinary remedies were tried for it, in addition to repeated changes of scene. When I began the sulphur fumes on 5th October 1867, her cough was very considerable, especially in the mornings and during the night; a slight degree of wheezing in the chest of long standing—not every day alike, some days scarcely perceptible, but after any exposure sure to be worse. At this time, too, the palms of the hand were generally warm, indicating a slight degree of fever, and the night sweats were constant and excessive. When I recommended her to be exposed one hour night and morning to the sulphur fumes, it was under the idea that, the cold season now setting in, the cough was almost certain to get worse, and continue so during the winter. Treatment began Oct. 5.

Result, Oct. 10*th*.—This day made a special visit and jotted down the following on the instant:—Her mamma says, 'R—is all but well.' Whereas she used to cough incessantly all night, more or less all day, and had always a bad brush every morning, now she has no cough at all, except still a considerable brush in the mornings. Look of health greatly improved. No heat in hands. I found her in a dusty room, amusing herself with the servants while ticks were being turned up, and a great amount of organic impurities floating in the air. I told them that this one exposure with an asthmatic patient might retard the cure, and confine many a one to bed for a fortnight. I resolved not to be disappointed though the cough were to return for two or three days.

12*th Oct.*—Fully better than when I saw her on the 10th. On the night of the 10th she did cough considerably, but none last night. Still coughed this morning a little, but very loose. The cure may almost be said to be complete. *Note*.—The girl who administered the fumes has had a sore nostril, up within on the mucous membrane, since the month of June, which she never could heal by glycerine, zinc ointment, etc., and this little obstinate sore has become better during the one week's exposure to the fumes. *Resolution*.—I am treating at present some obstinate skin diseases, of many years' duration, with the lotion. If they won't yield to the lotion I must try the fumes.

(To be continued if thought necessary.)

Oct. 20*th*.—Cough not yet quite gone. But the fumes have done immense good undoubtedly. General

health and appetite greatly better.

Dec. 4.—Still keeping comparatively well, and, as I think, has escaped consumption.

Jan. 12, 1868.—Kept well since last report, except that she had a threatening of croup a few days ago; which was arrested at once by spray and sulphur fumes; a dose of castor-oil was all the medicine she afterwards required.

CASE VII.—*Obstinate Skin Disease of Eight Years' duration*.

This case is that of a clergyman, one of my own most valued friends, and probably the most rigidly conscientious servant of his Master that I have the privilege of knowing. He has had two considerable scars on his face for the last eight years, one above the right eyebrow, the other extending down the face between the cheek and nose. To the cure of this affection I set myself in right earnest several years ago; and after exhausting in vain all my resources, sent him for additional advice to some of the most eminent men in the profession, with a like result. For some years the clergyman had given up all hopes of ever finding any cure, and all thoughts of trying doctors more. Nor would he have thought of it yet, had I not rather abruptly asked him, about four or five weeks ago, 'Please, sir, will you oblige me by allowing mo to try and cure your face?' The astonishment which this abrupt question excited in my friend may perhaps be participated by the reader, when I inform him, that at that time I had never tried the sulphur cure. At the moment I was looking out for some of the most inveterate cases I could find, to put on its trial another plan of cure, scarcely, if at all, inferior to that of sulphur itself. From the importance of the subject, and to introduce to your notice the power of *diet* over diseases generally, please allow me to diverge a little from the sulphur, and tell you a short story about another medical practitioner, more insignificant than the Kirkcaldy doctor still.

This country surgeon had lately a bad attack of functional heart affection, to such an extent as caused both himself and friends to think he was dying. Being very weak, he was taking all sorts of nourishing matters to recruit his strength, as well as drugs suggested by kind and skilful medical friends in Edinburgh, to cure his palpitation. Away from business at the time, and having little else to do but think, a thought occurred to him, 'Strength is imparted not by what the stomach receives, but by what the stomach can thoroughly digest.' Having pondered on this very plain axiomatic truth, he thought it contained a curative principle very applicable to his own disease, which, when applied, operated like a charm. 'If this disease,' thought he, 'one branch of the great trunk dyspepsia, be so amenable to the "right eating cure," why not fifty other branches, or nearly all the ills that flesh is heir to?' The more he thought of it, the more he became convinced that right eating, or perfect digestion and nutrition, was a curative weapon of tremendous power—that the obvious maxim which the whole world admitted in theory almost the whole world ignored in practice. That men's systems often get too little nourishment by their stomachs getting too much—were literally starved to death by a superabundance of nutritious food! And as he cured himself first by logic in his mind before he did it in his own person, so there and then he cured numbers of his former patients by logic too; and found, on coming home, that its practical application to these cases was equally satisfactory. He jotted down his principles of eating, What to eat? How much? How? and, How often? Illustrated their power by some striking cases (which had previously resisted not only his own former treatment, but the treatment of some of the most eminent of our physicians) and sent the paper in (meant as a contribution to a popular journal, and therefore filled with fun and jocularity) to some of the greatest wiseheads of the profession in Edinburgh,—their general answer being, 'valuable and interesting,' 'ought to be published,' etc. In short that, with all their jocularity, the papers contain serious and important medical truth. Induced by this consideration, I (beg pardon, the country surgeon I mean) will probably offer them to some popular journal. And I mention this story for two reasons:—1*st*. That should they be accepted by any journal, this story may account for, and partly excuse, such a jumbling together of trashy nonsense with a substratum of important medical truth; and 2*d*, Because the clergyman whose case I am now relating had been exactly one month on the 'eating cure' before the sulphur treatment began; and the healing process seemed to have set in, in some small degree, so as to afford hope of its ultimately being completed. But after finding, by experience, the healing powers of the sulphurous acid lotion, I thought it my duty to give him the benefit of it; although it was one of the conditions of the diet process when we commenced, that except a blue pill or so to begin with, no medicine, external or internal, was to interfere with the experiment. Indeed it is not always safe to attempt healing such sores (perhaps safety valves to the system) unless the blood be properly purified, and the whole system improved, which can be done effectually and permanently by perfect digestion and assimilation alone. The sulphurous lotion, then, was first applied on 7th October, so that this day (13th) it has now had six days' trial. Both scars are a little better, only being *hard, dry, elevated* above the skin, and of eight years' duration, the cure (if ultimately successful) must be tedious. I almost venture to anticipate a perfect cure by-and-by by means of diet and the lotion combined, and that if once healed, a healthy state of stomach and blood (induced and maintained by the 'eating cure') will prevent a relapse. (Space left for the result).

21*st October* 1867.—Extract of a letter received to-day from the clergyman: 'My face, in my opinion, still continues to mend; very slowly, indeed, but I trust satisfactorily. The lotion has certainly done it good. But, in justice to the dietetic principles you inculcated on me, I must add that the healing process had apparently begun before the lotion was applied. Further, though I thought myself in good health before, my appetite and general tone of system are greatly improved. The improvement in my eyesight especially is very marked,' etc.

October 30*th*.—The lotion has not fulfilled expectations. Perhaps no external applications can cure this case. Diet treatment is the only chance. But whether the promise of amendment shall continue I dare not say.

Nov. 4*th*.—Looking better to-day; apparently healing well.

Feb. 26, 1868.—Since the weather became colder, the sulphurous acid seems to have lost its power. But though this case has proved intractable both to spray and a sulphur healing salve combined, a similar treatment I have found successful in several obstinate skin diseases of three, four, and even twenty-five years' standing.

CASE VIII.—*Case of threatened or incipient Consumption*.

On Friday, the 2d October 1867, my much esteemed and skilful friend, Dr. Crawford of Peebles, sent a letter to me, accompanied by a patient (who was a relative of my own), requesting that I would carefully examine him, and report if I could 'suggest anything further in the way of treatment.' A growing lad, age nineteen, rather badly formed chest, had contracted a cough in early spring; had tried change of air for it repeatedly, cod-liver oil, quinine and sulphuric acid, croton oil to chest, etc. The uvula, tonsils, and back of the pharynx covered extensively with granulations, which were coated with yellow muco-purulent matter. Dr. C. had sponged over these parts with caustic twice a week. But matters were gradually getting rather worse, besides cold weather setting in. The expectoration of muco-purulent matter was very abundant, and tinged with blood; a good deal of wheezing in various parts of the chest, especially under the left clavicle; sound on percussion pretty clear, except in the lower part of left side in front. Dr. C. hoped phthisis had not yet begun, but evidently threatened.

On the patient entering my house, a great cough at the door brought up a considerable amount of brownish purulent matter tinged with blood. After careful examination, I wrote as follows:—

'BIGGAR, 3*d October* 1867.

'MY DEAR DOCTOR,—I wish I could be as thoroughly satisfied with the condition of——as I certainly am with your treatment of him. You appear to me to have tried all ordinary means applicable in similar cases. But, notwithstanding your judicious treatment, I fear he runs a great risk of falling into phthisis, if not indeed beyond the borders of it already, unless something can be done to check that great discharge of purulent matter tinged with blood. In addition to his ago, duration of the cough, etc., this discharge appears the most alarming symptom. Where does it come from? A great deal certainly from the granular mucous membrane of the pharynx; some, probably, from the same membrane of the bronchial tubes down to their most minute ramifications (from the râles of the chest this is likely). None, *it is to be hoped*, from any burst tubercles or lung cavities. Come from where it may, we must, I think, apply some astringent lotion (as it were), in vapour, of course, to the *very parts affected*,' etc. I then detailed the process of sulphur fumigation, suggested an hour of such fumes morning and evening, and requested him to procure Dr. Dewar's pamphlet and judge for himself. Both of us agreed that a viper was hatching, if not already hatched, though it had not yet, we fondly hoped, firmly laid hold on, or eaten any holes into, the poor boy's lungs.

On yesterday, the 12th, I wrote the following letter :—

'BIGGAR, 12*th Oct.* 1867.

'MY DEAR DOCTOR,—Now that——has had a week's trial of the fumes, please tell me how he keeps, by giving short and clear answers to the following :—1. Any diminution of the cough? 2. Of the purulent expectoration? 3. Any difference in the appearance of pharynx? 4. Still any trace of blood in sputa? 5. Any improvement, or the reverse, in the general health?

'I am jotting down a few notes of cases at present, or putting the Sulphur Cure on its trial. What do you think of putting the patient on *Hyposulphites* or *sulphites* of soda or magnesia instead of cod-liver oil? The sulphurous acid of such sulphites is supposed to enter the blood, and attack the enemy at its fountain-head (see *Medical Journal* for this month—*Art*. Jamaica, Yellow Fever).——should take care to have his evening fumes in his own bedroom, and not expose himself to cold after them. Dr. H. Douglas approves of long exposure to weak fumes, instead of such strong suffocating ones as to make people cough much.—I am, my dear Sir, yours most sincerely,

R. PAIRMAN.'

'Dr. CRAWFORD, *Peebles*'

Note.—This case is detailed up to this date, without hearing any accounts of the patient's condition. I mention this to show the honesty of my trial.

ANSWER, *dated* 15*th Oct.* 1867.

Being rather long, and alluding to other matters, I give only the substance of it :—1. *The Cough*.—Not materially improved, but the parents think 'rather better.' 2. *The Expectoration*.—In *quantity* much the same, but in *quality* much better. 'It is less purulent, and floats in water better than formerly.' 3. The *blood* in expectoration.—Still some blood now and then. Some days not quite so much. 4. *The appearance of Pharynx*.—Greatly better, 'in fact it is now pretty well.' It was improving by the caustic, but 'the sulphurous acid has done it still more good.' 5. *The General Health*.—Never was very bad. 'He feels quite well except the cough.'

It strikes me that this answer is on the whole extremely encouraging. Almost every symptom slightly improved, others decidedly so, whereas formerly he was always getting rather worse.

Oct. 21. Having heard by an oral message on 19th that————was still keeping rather forward, I visited Peebles to-day, and in consultation with Dr. C. we agreed as follows :—'Decidedly better *in every respect.* We think the sulphur fumes have served him much. Should the improvement continue, we consider it not a case of *cured* phthisis, but of threatened phthisis arrested in the meantime.

R. C.

R. P.'

'PEEBLES, 21*st Oct.* 1867.'

Note.—From the result of this case, Dr. C. has been using the fumes, and sulphurous acid internally, in a bad type of scarlet fever prevailing in Peebles at present, and authorizes me to state that he is quite satisfied of their good effects.

Note for Third Edition.—Like Dr. C. I have since tried the same plan in scarlet fever, and found it to answer well,—viz., occasional fumes, spray or sulphurous acid gargle, and acid internally every hour.

Note for Seventh Edition.—Dec. 4.—Dr. Crawford reports 'Patient improving, and gaining weight.'

Note for Thirteenth Edition.—Feb. 27, 1868.—Since last report he has passed through a severe attack of influenza, accompanied with congestion of part of left lung, and expectoration of bloody phlegm. This attack exhausted his strength greatly, but now (as Dr. C. writes) 'he is in a more favourable state than he has been for four months.'

CONCLUSION.

It would be easy, Reverend Sir, to multiply examples without end.

Though using the sulphur fumes before, it is only but very recently since either the Spray-producer or Sulphurous Acid came into my possession. And when I tell you that the half of the cases are not detailed, that never a day passes without my requiring to use the one or the other, generally with advantage, never with hurt (except in the one case of asthma), I am sure you will agree with me that these agents are destined yet to play an important part in medical science. I decline to give any decided opinion on the merits of the 'Great Sulphur Cure.' I only state facts, and allow people to judge for themselves. But without anticipating the magnificent results expected by its proposer, I can cautiously and thoughtfully state the following as the result of some experience and observation not here noted down :—

1. In a great many external maladies, hacks, chilblains, running cars, excoriated nipples, open sores of every kind, it is invaluable; as a hair-wash for scurf, it is admirable;

1 part acid, 1 part glycerine, and 5 or 6 of water, form probably the best hair-wash in the market, not only cleansing the hair, but destroying the fungi on which scurf, dandriff, and some kinds of baldness depend.

as a wash for ulcers, its healing powers are great; as a dressing for recent flesh wounds, it is perfectly wonderful altogether. Indeed, I suspect that pyæmic fever itself, that fatal plague of hospitals, may be as easily managed as 'snifters' in babes, that plague of mothers. Between sulphurous acid and pus there seems as great antagonism as between fire and vapour. The acid simply dries it up and annihilates it. *Ergo*, By all the rules of logic, what can pyæmic fever do but die of starvation, from want of the pus on which it feeds?

2. In a recent case of slight sore throat (where the inflammation covered all the uvula and tonsils), one injection of the spray cured it so quickly, that I just thought, Well now, had that been incipient diphtheria, would the spray have killed the young tender fungi quite as rapidly? Perhaps it would. And could that infectious disease, by being nipped in the bud, be thus prevented from extending in families? In Kirkcaldy, at any rate, this destroying angel, as a *spreading* epidemic, seems to be shorn of half its terrors.

3. Since it seems to be an established fact that, in seasons of rinderpest and pleuro-pneumonia, no such plagues come nigh any byres where systematic fumigation is carefully practised, why, in seasons of diphtheria or other epidemics, should not all houses in the neighbourhood be statedly and carefully fumigated too? Would

the village of Elsrickle, where the houses are generally small and confined, have suffered so much from diphtheria six years ago had this precaution been adopted? I think very decidedly not. Fumigation is harmless.

4. In coughs, colds, windpipe and chest affections, we may congratulate ourselves on acquiring a weapon to fight them on something like the same terms as we fight an ulcer in the leg; an agent to ferret out the enemy and attack him in his secret hiding-places instead of chiefly dealing with him by external applications. We can smook the bees instead of blistering the 'skep' where they are buzzing! The smooking will not always kill them, indeed. Neither will an ulcer of the leg always heal. But it is certainly a comfort that some healing remedy is applied directly on the sore in either case.

5. What about consumption? We will be wise not to expect anything great. But since vegetable fungi have been detected both in the expectorated matter of consumptive patients, and in lung cavities after death, who can calculate how much these fungi may promote the disease, and how much their destruction may help to cure it? Besides, is it not something encouraging that even the physician of Chalmers' Hospital, while in regard to other diseases 'anticipating good results,' hesitates in regard to consumption before he can give a 'decided' answer? Verily, Rev. Sir, if these anticipations be realized; if sulphur be the means; 'itch' the instructor; a country doctor's byre the academy; the owner of that byre the great schoolmaster sent by Providence to elucidate and disseminate the truth among us all; it surpasses in importance the lessons learned in other byres by the immortal Jenner; and preaches aloud to all mankind, 'God hath chosen the weak things of the world to confound the mighty; yea, and things which are not, to bring to nought things which are.' How foolish of any to ask, 'Can any good thing come out of Nazareth,' or Kirkcaldy?

6. I have private sources of knowing (though I dare not mention names) that one of the most sagacious of our Edinburgh professors 'augurs great results from the extended adoption of the Sulphur Cure.' What these 'great results' may be, it is impossible to say. But though not accustomed to interpret Scripture much, my experience in interpreting the short, pithy, and enigmatical utterances of that cautious man suggests, that more is always meant than appears on the surface. Without supposing them to mean a revolution in medicine, or the regeneration of the world, would it be an abuse of private judgment to suppose that the 'great results' may comprehend, *firstly*, very shortly a conflagration of our quack pills, pulmonic wafers, and pectoral candies; and *secondly*, The conversion of our drug shops into manufactories of sulphur? Further, who knows but that some pugnacious medical cobbler, at a *pro re nata* meeting of the United Colleges held on the occasion, might propose as a legitimate subject of dispute, 'What influence would it have on the happiness of the world, to substitute for our recently issued *British Pharmacopœia* an improved edition *of Meg Dods' Cookery?'*

7. May we not anticipate a great mitigation of fevers generally, cutting others short, etc., from sulphur fumigation? Dr. Alex. Fiddes seems to prove this. What is the mitigation of yellow fever by sulphites, but (according to his own theory) sulphurous acid in the blood producing its natural effects? and what a more natural or easier mode of getting it there, than by absorption directly through the lungs? Does not inhaled vapour of alcohol make people drunk, and breathed oil of turpentine show itself in the urine? Thus fumigation seems better in some respects than ventilation itself. Ventilation only pitches the enemy out of the window, and prevents imbibing additional doses of the fever poison, the same poison that laid the patient low. But while fumigation can do as much as this, if it really be absorbed, *it attacks the enemy also in the blood itself*. This is dealing with fever poison and the blood as any rational man would deal with arsenic and the stomach, supposing that stomach was always taking in some additional arsenic at every meal. 1*st*. Purify the food. 2*d*. Pour antidotes into the stomach itself.

8. Equally good results, one would expect, must accrue to attendants. Besides, as a slight sulphurous smell adheres to clothes after fumigation for a considerable time, may ministers of the gospel, city missionaries, etc., not almost take for granted that a slight fumigation of themselves, shortly before visiting a sick-room, will secure them against either catching infection themselves, or carrying it to their families?

9. In the meantime, What is to be done with Dr. Dewar himself? Burn him alive in his own lurid flames, and his magical machine into the bargain, as our forefathers would have done? No, no, in this advancing *unwarlock* age. We can only give him a vote of thanks. To be sure, we have been trying that gentleman for 'murder.' The verdict brought in has been 'Guilty, my Lord!' But when we bear in mind that the victims of his wrath have been the various destroying angels which afflict the world, why should the fellow not at once be 'strung'—in effigy, of course—on our parlour walls, as a benefactor of the race? To grant a testimonial in money would be as ridiculous as valuing health by ounces of gold, and as absurd as driving coals to Newcastle. The doctor will soon be rolling in wealth by his new patent for converting salmon and herrings into scones! This is positively true. The antiseptic treatment has as miraculous effects on dead meat and dead fish as on living men. By preventing putrefaction such materials can be kept sweet and pure for any length of time. By a process of drying and pounding into meal, the finest and most nutritious of bread, such as beef-baps, mutton-biscuits, and oyster-cookies can actually be baked; and the last accounts from Kirkcaldy are, that he is just now engaged in securing patents in all the countries of the world for this very end! This is another little

grudge that a certain little mind owes the doctor, who always dreamed that if the two medical pigmies were to unite their forces, the one to kill poison from without, the other to kill poison from within, the general superintendence of the 'eating' department should somehow or other have been left to the latter!

Finally, if you think this letter important, that it is an honest trial of a doubtful subject,—that the Sulphur Cure should be more extensively adopted in neighbouring parishes,—that a flame from Biggar Auld Crossknowe should extend some sparks, not to Peebles only, but as far as Hamilton and Crawfordjohn,—I give you leave to send my letter to your relative, Professor Christison of Edinburgh, if you feel inclined; to let the Professor show it to Dr. Halliday Douglas; to let Dr. Douglas declare whether the results of my short and hurried experience correspond with his own, *so far as it goes*. And, if the report from Chalmers' Hospital be favourable, it may be an afterthought between us whether this letter should be seen by any other eye in the parish but your own.—I am, Rev. Sir, yours most respectfully,

R. Pairman.

BIGGAR, *October* 13, 1867.

Additional Cases.

16*th October* 1867.

SINCE the foregoing Epistle was despatched to the minister, I have been to-day called to a case pretty well fitted to test the soundness of my hopes in reference to diphtheria. I take notes of it as it proceeds, and will honestly tell the result, whether it proves favourable to these hopes or the reverse. For a reason to be stated, I call the case

A FIGHT WITH DIPHTHERIA.

Some six years ago, diphtheria prevailed in Elsrickle and neighbourhood with unusual severity. The number of deaths was frightful. Among others died a young lady in a neighbouring mansion-house, daughter of probably the most heroic of our Indian generals, and most useful in quelling the Indian Mutiny. But if there was one house in the whole district where the enemy seemed to concentrate his force, it was the farm-house of H———. Here I had to fight single-handed with all the usual medical appliances for eight or nine weeks; neither friend nor neighbour almost dared to assist. The result was decided victory on the part of diphtheria; the list of casualties being two killed and five seriously wounded, from this family alone. To-day I got a message to visit this family *immediately*, for the youngest son, James, had been ill with sore throat since yesterday, and 'they were sure it was the bad throat.' Being prevented from going for half-an-hour, I sent with the messenger some chlorate of potash powders, and a gargle containing sulphurous acid, writing on the envelope of the bottle, 'Not to be touched till I come myself.—R. P.' On visiting shortly afterwards, sure enough I found it decided diphtheria, and threatening to be of a bad type too,—a large slough on each tonsil, foetid breath, foul tongue, hacking of phlegm, hot skin, feverish pulse, etc. I immediately told the family, 'Now, this is most assuredly the old enemy that killed two of your number, and made your hearth so desolate six years ago. I tell you this to put you on your guard. But keep up your spirits; for I mean to fight him with a different weapon,—only rest assured that your safety lies in implicitly obeying my injunctions.' All were only too eager to attend to them. In case, however, the poor patient might be discouraged, I added to him, 'As for you, James, you have no cause for alarm at any rate. I expect to relieve you in a very few minutes. The fight chiefly means keeping the rest from catching the infection.' I then injected some spray into his throat; but first caused him to swallow some water, to try the power of the spray in relieving pain. The patient expressed himself as greatly better, and swallowed some water much more easily. I then told him, as a curious circumstance, that sulphur fumes and steam formed the very same spray as what had relieved him so much at present; and if he wished to be speedily cured, he could scarcely be inhaling it too often. I then showed him how to use the gargle. In opening the cork, one of the sons stood back with suspicion, expecting some fearful explosion or another. On my laughing at his fears, he said, 'Why write on the bottle, "*Not to be touched*," etc.?' 'Because,' said I, 'I wished to look the foe fairly in the face, and see whether he was likely to be dangerous. The gargle might have altered things entirely, and made me doubtful whether it was the old adversary or no.'

The eldest son is fortunately a very clever, intelligent young gentleman, well educated, and thoroughly up to all modern ideas of *fungi, disinfectants, etc.*, and he undertook to see all my instructions carried into effect; so that if I fail in gaining the victory it cannot be for want of an efficient Lieutenant. The enemy, on his side, has equal advantages, having been twenty-four hours in possession of the field, and that one of his former fields of triumph; the very first shot of his artillery having evidently been meant to be a serious one, if not, indeed, of a deadly nature. Even now while I write, I can scarcely avoid such feelings as a general might experience in

commencing battle, when he exults in the hopes of a brilliant triumph, and feels that the issue of the contest is more momentous than either Austerlitz or Waterloo. I jotted down in writing for the guidance of my Lieutenant his 'Fighting Orders,' and should they prove effectual I commend them to the consideration of all medical soldiers.

FIGHTING ORDERS.

- Mild sulphur fumes almost constantly in the sick-room.
- Occasional inhalation of steam from warm water.
- Occasional poultices or warm fomentations to throat.
- Gargle to be used frequently, and then a little swallowed.
- A calomel pill at once, to be followed by castor-oil if necessary.
- A chlorate of potash powder to be dissolved in a tumbler of water, and used up in small draughts in twenty-four hours.
- Finally, and most important, should any one member of the household feel the slightest touch of sore throat, to use at once gargle, fumes, and steam, and send for me.

Note.—I applied no caustic, under the impression that it can scarcely destroy the fungi, but may screen them from what is able to destroy them.

I then left, and promised to call to-morrow.

Oct. 17.—When Cæsar described some of his immortal victories, it was in three graphic and most telling words, '*Veni, vidi, vici*;' a specimen of thrilling historical eloquence only equalled in the first chapter of Genesis. Fain to save time would I adopt such a pæan of triumph as my own. But it won't do. The battle still rages fiercely on both sides; victory doubtful, but I think slightly inclining to the side of right. The enemy in no respect dislodged from his strongholds. Both tonsils much swollen, and still covered with *sloughs*, held out by the adversary as flags of triumph. It strikes me that the right side flag is not quite so audaciously displayed to-day. A shot of spray from Dewar's tremendous cannon having again given great relief, I left the piece of ordnance in the hands of my Lieutenant, with orders to be used very frequently till my visit to-morrow. I ordered also the *whole house* to be fumigated once a day, lest the insidious foe might be lurking in ambuscade in some hole little thought of.

Oct. 18.—Visited to-day the Crimean field. Signs of victory in Sebastopol at any rate! which means, of course, the patient's throat. The shots of spray have been frequent and effective, dislodging the enemy from one Malakoff Tower or tonsil, while his force is decidedly weakened in the other. A medico-clerical friend accompanied me today, who was highly satisfied both with the relief afforded by the spray, the energy displayed in the 'fighting orders,' and manner in which Lieutenant T. was carrying them into effect. Ordered wine and beef-tea, and a continuation of all the former tactics. *Pulse* still very quick; *face* flushed, and *skin* hot.

Oct. 19.—Progress still satisfactory. The *fever* of war quite abated; its *pulse* of excitement quiet and steady; the citadel of health *out of danger* from the enemy's brisk but futile onset, though he still shows a feeble flag on the left Malakoff. My Lieutenant thinks he can deal with the foe now without my help. 'Well,' said I, 'see and watch him well; and for the sake of the other citadels not yet threatened, don't neglect to give the whole "Castra Quadrata" a smell of gun-powder once or twice a day at any rate.' This he promised faithfully to do; and this indefatigable officer, though strong in mind, having been rather weakly in body for several years, my final advice was—'In covering yourself with fumes, you may not only cover yourself with glory, but perhaps with a bloom of health besides, that your cheeks have not seen for many years.' *A.* 'Indeed, Doctor, it strikes me I am a little the better of them already.'

Oct. 20.—Latest despatch from the seat of war. Lieutenant T. writes:—'J. keeps on improving.' 'Getting rather a better appetite.' 'Still two small spots in the throat.' 'Getting out of bed.' *Answer*. Told him to keep brushing the spots with sulphurous acid, and for the safety of the rest, not to neglect fumigating the *whole house* for a time. *Lesson*.—Fumes are harmless, and don't increase *fever* at any rate. For it was while the sick-room was almost constantly filled with them, that the fever abated in a marked degree.

Nov. 4.—The patient's recovery satisfactory, and up to this date no threatening of attack on any other inmate. The enemy apparently slain.

Practical Conclusion.—People of Elsrickle, and of every hamlet in the land! attend to this case. Clean your houses; see to your ditches; dry up your *dubs*; look to your drains; and if diphtheria again invade your village, why not scare him from your hearths by lurid burnings systematically adopted, and choke him to death by sulphur fumes?

CASE X.—*Cancer of the Lip*.

16*th Oct.* 1867.—Strictly speaking, this should have been noticed under the head of 'Trifles.' What! call cancer of the lip a trifle? Certainly. Because such sores are not generally real cancers at all, but mere local incurable sores, with hard cartilaginous edges, that won't heal by any applications; and though they will certainly kill the patient if neglected, they may take twelve or fifteen years to do so, which allows ample time to excise them with a bistoury, a slight operation almost invariably successful. Be this as it may, I happened to have such a case in hand before hearing of the sulphur cure. I told the patient at the first that it must come to the knife; but as it had only existed some six weeks, or thereby, beginning with a small blister that never healed, he might try a little salve in the first place. Some three weeks of the salve doing no good, it was agreed to cut it out any day he chose to come to me. But people have a natural affection for their lips. It was always to be done 'some day;' but before that day came, I came into possession of the sulphurous acid. So, on the 5th October, I gave him a small phial of the acid mixed with glycerine, and told him to keep a piece of lint constantly wet with it on the sore. Having more important cases to attend to, this case was neglected till two days ago. On calling to ask for him, the patient being out, his wife told me it was no better. 'But the truth is,' says she, 'it has never had a chance. He won't be seen with white lint on his lip, and is scarcely ever at home.' 'Indeed!' exclaimed I, 'and your husband in such imminent danger of his life!' which being interpreted, means, 'Please, ma'am, advise him to give the lotion a trial.' Strangely enough, even this device was not sufficient, for, on calling to-day, I found that the lotion was still neglected, or imperfectly used. Not to be done with such an unruly patient, I changed my tactics. 'Here have I now been your family doctor for many years, and during that time have done you all the good I can. You cannot refuse such a small favour as allow the lotion fair play for two days' time. This lotion is a new thing, and I am exceedingly anxious to test its powers. Your lip is but a trifling sore, but *most unhealing*; if it can cure it, what a lesson it will teach me how to cure other things of more importance!' This appeal had the desired effect. I applied the lint myself to-night (16th October), and he promised to keep within doors for two whole days, and keep the lint always wet with the lotion. The result shall be stated on the 18th.

18*th October* 1867.—Unsuccessful. For a short period (for the healing powers of sulphurous acid seem a question of hours rather than of days) it promised well. But my opinion is, it must come to the knife. I will try for a few days longer.

22*d October* 1867.—'*Delenda est Carthago.'* I excised the sore to-day with the aid of my professional brother, Dr. A. Kello. It is almost gratifying to find one case of failure. Amid all my eager searching for flaws, positively I was beginning to fear that the most serious flaw of all was hurting the *material*, by improving the *therapeutical* resources of the profession!

CASE XI.—*Hœmorrhoids or Piles of several years' duration* (*Nov*. 3).

A lady patient of mine, of sedentary habits, has been afflicted with piles for three or four years, not at all times alike, but often bleeding, festering, and extremely painful during that period. Concealing her complaint long, the disease went to such a height, that two months ago she consulted me and submitted to an examination. I found them swollen, inflamed, and painful to the touch; told her that an operation was her only chance; and intending to send her to Professor Syme if necessary, I offered in the meantime to apply a ligature to the more prominent as a means of affording temporary relief. She agreed to this; but first I put her on some sulphur and cream of tartar internally, and advised the frequent application of either warm or cold water cloths, as she found most suitable. This treatment doing some good, the ligature was never yet applied. Three weeks ago she took a dish containing burning sulphur, and contrived by some convenient apparatus to have the fumes applied directly to the parts every night before going to bed. After the *third* or *fourth* application all bleeding and festering ceased, and the pain became greatly relieved. To-day (3d November) *she is all but perfectly cured*. There are still some remains of the piles, but nothing to give her any inconvenience. Probably a little spray would have been equally effectual. On asking her what superior skill had put her up to such a plan, she said, 'No doctor's skill at any rate, but that of Mr. J——N——,' mentioning the name of a shrewd old Biggar mason. In less than three minutes I was in the mason's house, and found to my surprise that he had never heard the name of Dr. Dewar. An old 'pensioner body' on the bounty of the Castle-Craig family had told him of this in the year 1803! Since then he had recommended it in 'scores' of cases, and never once knew it fail either in making a cure, or at least 'durring,' *i. e.*, soothing the pain very quickly. I told the gentleman that his name might yet live, long after he was dead, as the 'Biggar Mason.' 'But, you old rascal!' I continued, 'why did you not tell me this thirty years ago, and save the world from many a groan, long before "Dewar" or "chloroform" was heard of?'—*A.* 'You laugh so much at "old wives' cures," I never thought it worth my while.' He then repeated the names of many parties who had used it.

NOTE.—When the first edition came out, some true friends of mine, of taste and refinement, seriously objected to this case being introduced into a popular pamphlet. 'What!' said I, 'must etiquette then be the grave

of usefulness? and must secretly suffering multitudes not be relieved lest a false delicacy be offended?' The following letter, I think, from a most respectable lady, and published by permission, is a sufficient answer:—

'——18*th Nov*. 1867.

'SIR,—It may gratify you to learn that the reading of your pamphlet has enabled me to cure myself of bleeding piles by two applications of a sulphur lotion, furnished by you for a neighbour's sore hand. The first application caused great smarting for about fifteen minutes; then all pain left, and perhaps the second dose was needless, but I put it on.—Yours most gratefully,

'TO DR. PAIRMAN, Biggar.' '————.'

Note.—This lotion consisted of—Sulphurous Acid 2 oz., Glycerine ½ oz., Water 2 oz. Mix.

CASE XII.—*Erysipelas or Rose of Face*.

Late on the evening of Monday 11th Nov., Mrs. H—, aged sixty-seven, residing at a farm-house near Broughton, bad with erysipelas in face, sent an urgent message to me to see her *immediately*, the erysipelas having extended across the nose to both cheeks, a large blister on one cheek from the severity of the inflammation, the pain of a burning character, and both eyes shut up from swelling. Unable to attend at the time, I ordered a dose of castor-oil, gave a lotion consisting of equal parts of glycerine and sulphurous acid, to be applied frequently with a brush, and promised to visit by first train in morning.

12*th*.—This morning she expressed herself as free of pain; and instead of the eyes being shut up, there is scarcely swelling about them at all; though the patient is very feverish, tongue very dry, and she appears to me to be in a serious state. 'When did the pain leave you?' asked *I. Ans*. 'On the instant after the lotion was applied.' *Q*. 'Was your sight restored as rapidly as that?' *A*. 'Not quite; it took several minutes before the swelling about the eyes subsided.'

13*th*.—Visited to-day. Still very feverish; inflammation extending down the neck and across one ear. No pain. When pain threatens the lotion checks it.

14*th*.—Scarcely a trace of inflammation except on left ear, and on scalp amongst the hair. But constitutional symptoms very bad, the most alarming of which are weakness and restlessness; the patient having scarcely tasted food since 11th. Prescribed wine, beef-tea, and tincture of steel every two hours.

16*th*.—The severity of the local symptoms decidedly subdued, apparently checked; but constitutional symptoms no better. Pulse quick and intermitting, restlessness, thirst, great debility, etc. But being no worse since last report, and there being no delirium, the case is hopeful.

18*th*, 8 A.M.—To save me the trouble of visiting to-day, the husband has just called, reporting his wife as greatly better. Yesterday the inflammation spread on brow and down one cheek a little, but to-day appears completely killed. Curiously enough, however, she had considerable local pain and smarting which the lotion did not control until the afternoon. How to account for this I know not. But the disease has lasted exactly one week, and except in its origin and death she never complained of pain at all.

Remarks on this Case.—Some medical men, thinking erysipelas a kind of fever, and its specific inflammation virtually a rash analogous to the rash of scarlatina, may doubt the propriety of controlling the inflammation so much as sulphurous acid seems to give us the power of doing. For my part I think the treatment was good; that had the patient died, she would have died in spite of sulphur, and that since she lives, she lives partly in consequence of it; because if to the serious constitutional symptoms had been added very severe local pain and inflammation, she might probably have succumbed. The family had no idea that the clear watery-looking lotion, when first applied, had any sulphur in it. But so astonished was the husband at the rapidity of its effects that he said, 'This must be some other new thing of the Doctor's, very different from the brownish stuff (iodine) that he used to give my daughter.' Does this case not explain, almost with the force of ocular demonstration, how spray acts *so quickly* on the inflamed and swollen mucous membrane in stuffed nostrils, sore throat, laryngitis, etc.? Dr. Joseph Bell writes me that some of his cures in these affections have bordered on the 'miraculous.' If this case is not a key to the 'miracle' performed in such hidden cavities, it seems at least its counterpart visible to the eye.

Note.—While this case was being treated at Broughton, another case, almost precisely similar, was being treated in Cowgate, Edinburgh, by an intelligent trustworthy student in connexion with the Thistle Street Dispensary. The two cases were so nearly identical (the one in an adult, and the other in a child), the lotion and its results being so much alike, that we may consider it as a truth now established by the mouth of two witnesses, that sulphurous acid is the best application yet discovered for erysipelas.—(Certified to me by one of the Physicians of the Dispensary.)

CASE XIII.—*A Story important to Public Speakers*.—(18*th Nov*.)

The indefatigable Mr. George Easton, Agent of the Scottish Temperance League, is subject to bad colds, which generally last several weeks; and as he has to address meetings almost every night, they are apt to go on from bad to worse. Such a cold shut his mouth (not easily done), and debarred him from all meetings during July and August of this year. On Wednesday last he caught such a cold. It was growing worse daily, though he was still performing duty, till he reached Biggar on Friday forenoon, for the purpose of advancing the cause of temperance. Having addressed a meeting at Skirling on Friday evening, on Saturday his cold was making progress; some huskiness or hoarseness was beginning to set in, which made him very concerned about the work before him next evening, to end probably in other two months' vacation. On Saturday night he happened to get hold, in the Biggar Temperance Hotel, where he was residing, of the First Edition of my pamphlet. He began to read; before being half-finished with it sent for me in haste; told me his predicament and fears, and asked if a little spray would not help him. 'Help you?' said I, 'only promise to keep silent till Monday morning, and I 'll have you cured.' For two nights past, he had coughed incessantly for upwards of an hour on going to bed before falling asleep. And the cough was none of your gentle things, but hard and pithy, stout and earnest, that reminded one of his own stentorian oratory! He would not promise to give up the meeting, but requested a few whiffs at once. After fifteen whiffs or thereby, I told him to have an hour of the fumes in addition before going to bed. That night he never gave a cough, but 'slept like a top' till morning. Coughed slightly during Sunday, but quite loose; addressed his crowded meeting on Sunday evening; felt nothing the worse of it, though the night was frosty; repeated both fumes and spray before going to bed; and after another night's repose, rose on Monday morning in great glee and spirits, found his gloomy fears of being torn from his work at once dispelled, and himself a great enthusiast in another cause besides that of temperance. With apostolic zeal this gentleman has long advocated what he considers a righteous cause; but let the League beware : even temperance now shares not his undivided affection. *Note*.—I insert Mr. Easton's name at his own request, because, being well known in almost every quarter of Scotland, he invites all who may doubt this case to ask particulars of himself.

'Edinburgh, 22d November 1867.—The foregoing particulars are correctly stated; and as the lady who showed me the pamphlet was Miss——, who sung two lines to the tune of Old Hundred (Case III.) I certify that her case also (by her own account) is strictly true.
'GEORGE EASTON.'

CASE XIV.—*Case of Tic, worth the attention of Sufferers in general, and Homœopaths in particular*.—(*24th November*.)

Mr. L. P., shoemaker, Biggar, has been subject to severe attacks of tic for the last twenty years, during which period I have treated him myself some eight or ten times, with quinine, etc., and various external applications; the attacks generally lasting a fortnight or thereby. On Thursday, the 21st, he consulted me for an attack of his old enemy. This was the *fifth* day of the disease. The pain was most acute in left eyeball, and above the eyebrow across to the temple. It always came on about nine A.M., and lasted till early in the afternoon. I gave as usual a dozen of quinine powders, one to be taken three times daily; and as the patient was suffering much during the consultation, I applied on the instant a pledget of lint, soaked with strong sulphurous acid, and covered over this pledget with oiled silk. I gave him also a phial of the acid, to repeat the application for a few times. In half an hour the pain was gone, before he had time to take one dose of quinine!

What makes me think that the sulphurous acid was the cause of relief is, that the pain left on that occasion two hours before its usual time; and, especially, that it has never since returned, except to a trifling extent next day. When he felt it threaten, he fain would have applied the acid and lint to the eyebrow again; but the part being all blistered from three applications of the previous day, he very sagaciously adopted milder measures. Uncorking his bottle he took a few sniffs up his nostrils, and the potent imponderable homoeopathic dose, thus imbibed, checked it in a moment.

Note.—It would be rash to draw conclusions from a single case. But if this be a fair sample of how we are to deal with tic in future, what a curative weapon have we not discovered for fighting not only tic, but toothache, rheumatism, neuralgia, sciatica, and a host of other most intractable diseases?

Note.—Since writing the foregoing, I can report as follows:—*Slight case of Earache*.—One day's duration; slight pain; disagreeable ringing in car : considerable deafness. *Treatment*.—A few whiffs of spray. *Immediate Result*.—No pain; no ringing; hearing perfect. *Result next day*.—Hearing keeps perfect; ringing scarcely perceptible; kept free of pain till midnight, remained sharp for several hours, towards morning some blood escaped from ear, giving great relief. Now (twenty-four hours after spray) so nearly well, that she won't have another whiff.

Toothache.—My experience in toothache is, that spray generally gives relief, but not invariably. To-day I tried *first* soaking the cavity with strong acid, then applying a pledget of lint, wet with acid, between the gum

and cheek. *Result*.—Immediate relief, which continued during the fifteen minutes of the patient's stay in my house. *Query*.— How will this acid, frequently applied, affect the teeth? Do harm, like other acids? or good, by preventing decomposition and decay? Beyond all dispute it does good, by preventing decomposition and decay. Indeed, mixed with glycerine, and rubbed on with a sponge, it forms an admirable tooth-wash.

Note for Thirteenth Edition.—As the result of further experience I find that strong sulphurous acid, locally applied, generally gives relief in tic, neuralgia, toothache, sciatica, lumbago, and rheumatic joints. It seems to act both as a counter-irritant and anæsthetic, or like mustard-poultices and chloroform combined; though in some instances it certainly fails. A slight headache, in or near the frontal sinuses, is often relieved by simply smelling the acid from a bottle.

CASE XV.—*Croup in a Child*—(9*th December*.)

Since beginning the system of sulphurous acid medication, I have been on the look-out for a case of croup, feeling quite assured, from its influence over larynx diseases generally, that its controlling power over croup would be something marvellous. Having no case of my own to record, it affords me great pleasure to make the following extract from a private letter just received from my friend Dr. Crawford of Peebles. I insert this the more readily (with Dr. Crawford's permission of course) because the writer happens to be my first professional convert; and especially because he did me the honour to become converted on my own *ipse dixit*, from his personal knowledge of me, before he had an opportunity of testing the system for himself:—

'The other day I was called to a case of croup in its second stage, the breathing being stridulous and the cough dry and characteristic. After half-an-hour's use of the spray, the cough got loose, the breathing moist, and the patient soon got well. In other circumstances this little patient would have been frightened to death with leeches, sickened nigh death with emetics and antimonials, and perhaps have died after all its torture. Although you could point to no other result than this one case, you could controvert all the doctors opposed to you. . . I cured myself of a nasty hoarseness in a few minutes, which might have bothered me for days. My friend Dr. Balfour, Edinburgh, after much experience, has unbounded faith in the treatment, has never less than six "machines" constantly out, and would not want them for anything.'

(*Note*.—This testimony is all the more valuable, as having been written in the confidence of private friendship, without any expectation of publication.)

CASE XVI.—*Asthma.—Detail of Treatment as a Guide to others*. (2*d December*.)

W. M., aged twenty, residing in Biggar, came to my house after dark, on the evening of Monday, 2d December, to be cured, by a few whiffs of spray, of an attack of asthma of several days' duration. He was breathing with the greatest difficulty, very feverish, cough of a stridulous character, stomach out of order, and could get up little or no expectoration. The night being frosty, and the roads all covered with snow, the treatment began by ordering him home at once, and off to bed, where he would scarcely go, his breathing was so bad. He had experienced similar attacks during the last two years, during the last year especially. Indeed, for twelve months he had rarely wanted a cough, some wheezing in chest, with the addition besides of such asthmatic attacks for a fortnight or more every now and again. He was looked on by his neighbours as a poor, wheezing, weak-chested lad, on the borders of decline; but always contrived to recruit sometimes, gain better breathing, and pick up a little strength. On visiting him I first administered a few very cautious and gentle whiffs, which excited coughing and increased the breathlessness considerably. At intervals of one minute, and sometimes two, I continued injecting a dose of spray. In fifteen minutes or thereby the breathlessness was at its height, and cough of a 'squealing' character. Soon afterwards the cough changed a little, brought up some expectoration freely, for the first time, and by continuing the spray (now more continuously) the cough became decidedly looser; he expectorated well; so that in half-an-hour the victory was virtually gained. To keep up the good effects thus induced, I forthwith set agoing sulphur fumigation, ordered it to be kept up for two hours, until the family retired to bed, with inhaling of steam occasionally, and then left.

Tuesday Morning, 3*d December*.—Greatly better. Less feverish. Cough much looser. Says he passed a good night and slept well,—though his parents declare that he moaned considerably, and seemed uneasy during sleep. Tongue being very foul, ordered him laxative medicine, a restricted diet, and an hour's mild fumes three times daily, especially before bedtime.

Wednesday, 4*th December*.—Comparatively well. Never saw more of him until the 9th.

Monday, 9*th December*.—Says he felt as well as ever he did in his life; but this is an exaggeration,—for a slight cough still remains, though very loose and not troublesome. He means (on cross-questioning him) that he is better than he has been for the last year. Put him on gentle laxatives and a restricted diet, to see if treatment

directed especially to the stomach will ward off any future attacks, and eradicate asthma out of his system.

CASE XVII.—*Sulphur Fumes in Pneumonia, or Inflammation of the Lungs*.—(5*th January* 1868.)

Mrs. B., aged 67, has for the last week been under treatment by me for pneumonia in left lung. Pain in side, fever, crepitous râle, cough, sanguineous expectoration, etc. Up to this date (5th Jan.) she has been progressing favourably on the whole, under the ordinary treatment of perfect rest, diaphoretics, mustard and fly blisters, etc.; but on visiting her to-day (the eighth day of the disease) I found her not quite so well. Pulse 80; tongue foul and very dry; pain not worse, but little abated, and much aggravated by coughing or a deep inspiration; face flushed; cough almost incessant; no sanguineous expectoration for several days, and to-day no expectoration of any kind, the cough being dry, and by its continuance threatening to increase the inflammation.

Thinking over these symptoms, I concluded that sulphur fumes would more safely arrest the threatened relapse, than the reapplication of a blister to a surface already raw, or the prescription of antimonials to a system aged and already weak. At half-past 2 P.M., therefore, I lighted up a little sulphur, making the fumes very weak at first to watch the effect. The cough being not made worse, I burned a little more in fifteen minutes or so, and then left, with instructions to continue the same at similar intervals, during the whole afternoon and evening, till I should call and see the result.

Visit at half-past 7.—Has had five hours of mild fumigation. Pulse the same; flush in face the same, and aggravated by the heat of the room from too large a fire. But pain greatly diminished, and cough loose: a deep inspiration causes a catch and induces a cough, but excites much less pain. Gives a pretty free cough, instead of the dry, hampered, and lung-irritating cough of the forenoon. Altogether the change resembles that which often passes over the cough of : child from the operation of an emetic. Even the tongue is a little better, being not so dry.

Ordered the fumes to be discontinued for one hour, and then resumed for two hours before the period of sleep.

Next morning, January 6.—Found the patient under the idea that she was greatly worse and rapidly sinking, and the family giving sulphur all the blame. Seeing on the contrary, that both in respect of pulse, pain, cough, tongue, etc., she was vastly better, and that her restlessness, uneasiness, and sinking feeling arose from nervousness and want of food, I only ordered a little light nourishment frequently repeated, and a continuance of the fumes during most of the day.

Evening Visit, 8 P.M.—Decidedly improved; cough loose, and not nearly so frequent; pulse 66; tongue soft; appetite improving; pain trifling; patient herself in good spirits, and now convinced (as are all the family) of the great benefit the fumes have bestowed.

3*d day, Jan*. 7*th*.—Pulse 62; and the patient begun to recover well. No further report is thought necessary; but so long as there is any cough, I mean to continue the fumigation mildly.

Remarks.—Not to found more on this case than seems its due, I beg to state that in all probability a continuation of ordinary treatment by antimonials and blisters would have carried the patient safely through the disease, which, on the whole, was mild throughout. But it appears evident that the fumes, while apparently acting as a substitute for antimonials, were much more mild, and equally safe.

Lest any one may think that fumigation in pneumonia is carrying the 'Sulphur Cure' to an extreme, I beg to remind him that liquid sulphurous acid, either as lotion or spray, seems to destroy inflammation wherever it meets it, as in the inflamed membrane of throat, nostrils, larynx, and ear-passage; on the inflammation of rose it acts as a charm; even for the inflamed skin around a wound or ulcer, leeches and warm poultices combined can scarcely compete with it. *Ergo*, Why should the vapour be prohibited from touching an inflamed lung? If mucous or purulent infiltration be not excessive, it may be brought to bear on the very part affected, or, for anything we know, by absorption into the blood, it may so rectify that fluid as to act on the local lesion more indirectly.

Note for Thirteenth Edition.—26*th February* 1868.—Other two cases of pneumonia, similarly treated, have convinced me of the safety and value of mild fumigation, long kept up, in this disease—though not to the neglect of other treatment.

CASE XVIII.—*Sulphur Fumes as a Tonic and Cosmetic*.—(*Jan*. 12.)

Among my many striking cases, showing the power of fumes as a tonic, the following, I think, is the most remarkable. Mr. W. T. has been a delicate lad for several years, having been under the necessity of giving up

his situation in a lawyer's office in Edinburgh, and coming to the country on account of his health. During most of that period he has been treated by me with steel, cod-liver oil, quinine, citrate of iron, and other tonics, besides nutritious diet; all with a view of keeping up his strength, and warding off that consumption which arises from thin and impoverished blood, on the borders of which he ever seemed to hover. Two and a half months ago, while acting as nurse to a brother prostrated with diphtheria, his assiduous attention caused him to be almost constantly inhaling, for several days, the fumes prescribed for his brother's disease. The immediate effect was such an increase of appetite and comfort, that after his brother's recovery he continued stated fumigations on his own account. Forthwith his delicacy of years rapidly took wing, and by persistence in the same plan for several weeks, without any aid from tonics, he has now acquired a degree of vigour, power of enduring fatigue in walking, and youthful bloom of health, such as he has not experienced for many years. Chemists may account for this by the ozone given off during the oxidation of sulphurous acid, whereby the air to be respired is made sweet and wholesome by all organic impurities being destroyed. But perhaps still more may be due to that very oxidation itself, whereby what goes up to the atmosphere as sulphurous acid comes in to the patient's mouth as sulphuric acid, or *elixir of vitriol* in a state of vapour, a tonic and stomachic justly famed for sharpening the appetite all the world over. Be this as it may, it is gratifying to learn that sulphur fumes possessed the same tonic and stomachic properties about sixty years ago. In 1810, Sir Arthur Clarke, M.D., London, erected baths for treating skin diseases, by *steam* and *fumes* instead of sulphur and *lard*, under the idea that unctuous applications to the skin were most unwholesome, by clogging up the pores. He thus succeeded in curing common itch and more inveterate things, in from one week up to three or four; and in his 'Essay on Diseases of the Skin,' Sir Arthur says (page 38), 'The sulphureous fumigation invigorates the system, and fortifies it against the influence of cold; it supples the joints, gives strength to the muscles, and consequently agility to the limbs. It increases the appetite, promotes digestion, and clears the complexion; it gives smoothness and whiteness to the skin," etc. etc.; in short, expatiates on sulphur fumes in such a style as neither Dr. Dewar nor myself dare imitate, for fear of being charged with attempting to enlist ladies instead of physicians in the cause of sulphur, by sounding its praises as the best cosmetic.

CASES XIX. and XX.—*Coughs of several years' standing, attended with Lung Disease*.—(*February* 1, 1868.)

The gentleman of wealth and position in London, to whom the following letter is addressed, happens at the same time to be owner of an estate in the parish of Biggar; on which account probably he took an interest in my pamphlet from the first, and sent a copy to Mr. Gilbert, an invalid acquaintance. Mr. Gilbert's reply he has kindly sent to me, with permission to do with it what I please. It is gratifying to learn that the last accounts from Mr. G. are (31st January) that he continues well.

'GROTE'S BUILDINGS, BLACKHEALTH,

December 30, 1867.

'DEAR SIR,—You will perhaps be pleased to hear the result of my trial of the sulphur, as set forth in Dr. Pairman's pamphlet, "The Great Sulphur Cure," and which you were so kind as to give me about two months since. I should state that about two years ago (November 1865) I consulted an eminent physician for a troublesome cough of long standing, and was told by him that *one of my lungs was affected*, and recommended change to a milder climate. Being unable to follow that advice, I have since been extremely careful to avoid exposure to inclement weather, and particularly to night air, and have been compelled to take to a respirator; but notwithstanding have had frequent returns of *very distressing cough*, and *great difficulty in breathing;* in fact I had almost given up the idea of ever becoming restored to my former state of health; but as a drowning man will catch at straws, I determined to give the sulphur a trial, but I confess with the very slightest expectation of deriving any benefit from it. The first trial gave me relief. I continued it once daily for a week. This was two months since; and since then I have been *perfectly free from the old cough*, and indeed am altogether in better health than for some years past.

'Had it depended on my own experience only, I might have been doubtful of all this being the result simply of sulphur; but I had a gardener in my employ who was formerly in the army, and *was discharged as incurable*, suffering from a complaint of the lungs. Last winter I obtained him an outdoor patient's ticket for the Victoria Park Hospital; and he attended there some half-dozen times with some relief, but only slight. This winter his cough returned *in a most distressing manner*, accompanied with *considerable spitting of blood*. I advised him to try the sulphur; and he has done so with the same happy result as myself. In fact, he says *he is perfectly cured!* And from his altered appearance I have great hopes that he is so.

'Judging from these two cases, and particularly from my own feelings, I firmly believe that Dr. Pairman has given to the world a most important and valuable discovery, which is a panacea for all the numerous forms of perhaps the most distressing and fatal complaints of this variable climate .—

I am, my dear sir, yours very truly,

'ALFRED GILBERT.
'To J————Esq., London.'

Gleanings of the Past.

1. *A shrewd old Divine suggesting to the Faculty a rational mode of treating fevers.*

In Brown's Dictionary of the Bible (1815), among nuggets of solid theological gold, occurs the following medical gem (under Art. 'Vine'):—'When wine ferments excessively, and is in danger of rending the strongest cask, a little smoke of sulphur below it, or put into it, will stop it,' *i.e.*, medically speaking, when blood becomes the seat of fever-poison, and its excessive fermentation threatens to rend the strongest constitution, a little sulphur smoke 'put into it' (as Dr. Alex. Fiddes has been doing in Jamaica) will stop the fever, and save the patient's life. All honour to Dr. Fiddes and others who have adopted this plan, who must surely confess to have been anticipated notwithstanding, and that the wholesome theology of John Brown of Haddington might have taught us medical lessons long ago, had we been reading less of trashy literature, and paid more attention to things worth knowing.

2. *Lord Bacon on Sulphur*. (See Bacon's Essays, Art. 'Friendship.')—'You may take Sarza to open the Liver; Steele to open the Spleene; *Flowers of Sulphur* for the Lungs; Castoreum for the Braine; But no Receipt openeth the Heart but a true Friend.'

3. *Sulphur Fumigation in France in the beginning of this Century*.—It appears that a Dr. Gales commenced about the year 1810 to treat patients by sulphureous fumigations in the hospital of St. Louis in Paris, whose experiments 'attracted the notice of Government, who granted him an exclusive privilege of this practice in the French capital, with a pension for life of 6000 francs.' Away with 'pensions' and 'exclusive privileges' in the advancement of science! But for their torpedo touch, deadening what they are meant to foster, sulphur might already have been master of the field, instead of only beginning to fight its battle as an innovation.—(See a translation of Dr. Gales's work by Rees Price, Esq., published in 1818.)

4. *Nature providing 'Fumigating Baths' as well as 'Mineral Wells' ready to our hand*.—'In the celebrated sulphur fumigating baths on the Lake of Agnano, near Naples, the sulphureous vapour rises spontaneously through apertures in the earth, from the bosom of an exhausted volcano, and is collected in apartments into which the patients enter. There the action of the vapour is similar to that of the artificial sulphureous fumigation. The value of this remedy therefore was known many years antecedent to our investigations, and its present mode of application appears to have originated at or about the same period in France and in Ireland.'—(From Dr. Arthur Clarke on 'Diseases of the Skin,' published in 1821.)

5. *A Hint to the Sanitary Reformers of Genoa*.—(See Dr. Young on Consumptive Diseases.)—An old medical author, called Paschetti, condemns the air of Genoa as 'unfavourable to the consumptive.' Because, among other reasons, 'the atmosphere of a cow-house almost suffocated a person, although there was only one cow!' but he approves of Baaden, because 'the *sulphureous vapours* of Baaden, exhaling from the bath, seem to have relieved some patients who were sent there from Vienna.'

6. *One disease employed to cure another*.—In the *Continental Medical Journal* for 1811, page 269, the following curious case is related :—A female, who had in some mode caught the 'itch,' applied to a quack, who cured her in three days. Very soon she had 'want of appetite, chlorosis, cough, and afterwards confirmed consumption.' Another practitioner condemned the quack's treatment as the cause, and ordered her former state of skin to be restored. She was deliberately re-infected; and after the free use of sulphur, externally and internally, the 'itch' and the 'consumption' disappeared together! Unfortunately for our cause, the doctor who relates this case adds, 'in this country such cases have not been much observed or credited.'

7. *Modern 'Inhalers' and 'Spray-Producers' anticipated*.—Dr. Mudge of London strongly recommends (1779) a 'balsam of sulphur' for any 'obstinate husky cough.' He seems not to have known the value of sulphur 'vapour,' but in all chest affections caused his patients to breathe from his 'inhaler' other vapours of a similar nature, especially the 'smoke of resin,' and 'vapour of tar,' matters strongly impregnated with carbolic acid, probably the only respirable parasiticide that can at all compete with sulphurous acid. 'For a catarrhous cough,' says he, 'the inhaler affords a certain cure *in a single day*, being used for twenty minutes or half an hour.' After this, why should the miracles of our modern instruments be called in question, and 'The Great Tar Cure brought

to the Test' not tell us, whether some of these vapours should be revived in medicine? What is burning tar-barrels in seasons of epidemics but just disinfecting the lungs of a city, as Mudge's inhaler did the lungs of a man?—(See Dr. Mudge's Works, published in 1779.)

8. *What is meant by an Innovation?*—Ignorance only designates sulphur fumigation by such a term. Through the kindness of that veteran in the profession, Dr. Begbie, senior, of Edinburgh, who has furnished me with access to some old authors, I can demonstrate that the practice is more ancient than the Gnostic heresy, and that sulphur balsam, or sulphur fumes, formed the sheet-anchor relied on by nearly all the fathers of medicine in the treatment of chest affections from the remotest times. Thus, in the *Journal de Médecine* for 1763, Clapier relates a case of 'confirmed consumption' cured by living some time in a coal-mine. He attributes the benefit to the 'vapours of the sulphur,' and incidentally adds, 'which have *long* and *justly* been celebrated' in such complaints.

9. *Audi alteram partem*.—I find in my researches one foolish doctor, of the name of Juncker, anticipating modern sceptics by condemning the sulphurizings of his day as useless. So far from being able to cure consumption, etc., he maintains that 'sulphur is incapable of curing even a pustule of psora!' Perhaps his sulphur may have resembled what I lately heard about from a correspondent in a northern English county. This man wrote me that he was eager to try the 'Sulphur Cure,' but as he could not get a particle of sulphur *that would burn*, what was he to do? *Ans*. Send to Wolverhampton for some Sulphur Pastilles, and don't grudge the carriage!

10. *Experience of the acute and ingenious Stahl*.—This eminent physician (see his Works, 1704) thinks the flowers of sulphur safe in all chest affections, and says he has 'felt the benefit of inhaling the *sulphureous fumes* of crude antimony, having been cured by them of *an obstinate cough in a few hours*.'

11. *Sydenham's treatment of Cough*.—(See his Works, 1682).— Among other things, this immortal physician recommends the 'balsam of sulphur;' and in Sydenham's Cough Lozenges sulphur forms a principal ingredient.

12. *One great Doctor almost scolding another*.—The learned Willis attributes the exemption of some parts of England and Holland from consumption to the 'sulphureous smell' arising from their turf fires; and maintains that 'a sulphureous arsenical fumigation is like a balsam to the lungs.' According to Dr. Young, he prescribes sulphur for this disease 'in all possible forms.' And though Dr. Young admits that Willis has 'much learning, and labour, and anatomical accuracy,' yet he regrets that such an accurate and painstaking physician 'has produced little that is interesting respecting consumptive diseases *except a continued panegyric on sulphur*.'—(See Dr. Young on Consumptive Diseases, 1815.)

13. *The Cough Lozenges of Poterius, Physician to the King of France*.—In a case of 'confirmed consumption,' attended with diarrhoea, etc., Poterius professes to have effected a cure by five drachms balsam of sulphur every morning, a nostrum called his 'Antihectic,' every night, and sulphur lozenges and iris powder *held constantly in the mouth*. His commentator Hoffman explains the cure by supposing that 'the *vapour of the lozenges* was inhaled, and acted favourably on the lungs.'—(Works of Poterius, by Hoffman. Frankfort, 1698.)

14. *Sulphur fumigation the orthodox treatment long before the Christian era*.—An antiquary could extend this research almost *ad infinitum*, and from the fathers of medicine appeal to the grandfathers; leave such moderns as Sydenham and Harvey, John Hunter and Donald Munro, and ask the views of Hippocrates and Aristotle, Celsus and Paracelsus, Galen and Dioscorides. We select the opinion only of the last, because he was regarded by his contemporaries as the most accurate and comprehensive author on Medicine of his time; for which reason, probably, the clever and unprincipled Queen of Egypt, Cleopatra, made choice of him as her own physician. Dr. Young says (page 122), 'He recommends sulphur as useful in coughs and consumptions, either taken with eggs, *or as a fumigation*.' After this only think of some learned people scouting, as an 'innovation,' a practice in full force, and venerable with age, nineteen hundred years ago; and that all our boasted strides of medical science towards the curability of consumption, have resolved themselves at last into one stride backwards, to the treatment adopted in Cleopatra's bedchamber!

15. *Concluding Note*.—For most of these extracts I am indebted to Dr. Thomas Young on Consumptive Diseases, a work of great learning and research, and a perfect treasury of antiquarian lore. Nobody can fail to perceive from it that in bygone times sulphur has fought more battles in the sick-chamber than ever it has done as gunpowder in the field. This medical Wellington fired off his great gun of a volume in 1815, the very year of Waterloo; but the martial Wellington then eclipsed him,—it being more imposing to strike down tyranny in the battle-field than to combat disease in the quiet chambers of the sick. Thus, perhaps, did the curative powers of sulphur fall into neglect; but certain it is that though sulphurous acid medication is sneered at by some as emanating from certain obscure Æsculapian retreats, its abettors have no lack of courtly physicians in ancient London, France, and Egypt, to back them up.

Concluding Appeal to Medical Sceptics.

(*For Thirteenth Edition.*)

THE foregoing pages present some evidence that the sulphur system is no hoax, but a great reality, which no medical man, in the interests of the important trust committed to him, dare thoughtlessly reject. Let it not, however, be conceived as a panacea for all 'the ills that flesh is heir to,' or in many diseases applicable at all. It is only as an adjunct to other treatment that any rational man should view it. I for one never trust to its unaided power in combating any serious disease whatever. In consumption we must still cling to cod-liver oil, nutritious diet, counter-irritation, etc.; in diphtheria to chlorate of potash, warm fomentations, wine, and beef-tea, etc.; in asthma to all the various prophylactic means, and treatment specially directed to the stomach; in fevers and all malignant diseases to everything likely to assist Nature in her arduous struggle; in a word, we must select weapons wherever we can find them, and too often confess that all of them combined are of little avail. Still the evidence is irresistible that sulphur, sulphurous acid, and the spray-producer, are weapons of great, yea of telling power. Why then does the whole profession not cordially and at once embrace the system? So far as I can learn, one answer only is ever assigned—a toss of the head, and the supercilious remark, ' I have no faith in it.' Now let me seriously ask any well-disposed physician who utters such a sentiment, How can you justify your want of faith? Is the evidence afforded by Professor Polli's experiments, Dr. Dewar's pamphlet, and my own, not worth your trouble to attend to, though the reading of them may save the lives of your patients? Or, having read them, do you seriously believe that Polli's sulphites are mere myths, having no sulphurous acid in their composition, and that the facts alleged in the two pamphlets are pure fictions? Leaving others to speak for themselves, this is to suppose in regard to me, that a Scotch country surgeon already grown grey with the toils of practice, and whom a condemning breath from any of the eminent heads of our profession could annihilate in a moment, is a likely person to utter medical untruths; to suppose that four of our most distinguished Edinburgh physicians, and others that could be named, have taken such a barefaced quack kindly by the hand; to suppose that my venerable Preface-writer should so far forget the sacred name by which he is called as to vouch falsely for the truth of many of the cases; *i.e.*, it is to suppose that the objector himself has a judgment so imbecile in diagnosing *evidence* that it is not fit for diagnosing *symptoms*, or fit to be trusted in any matter whatever of life and death. If it comes not to this, the only alternative is, that believing the system to be true he won't embrace it, a confession of moral delinquency that only makes matters worse and worse, by acknowledging himself a traitor to the interests of man.

From this dilemma one escape only is apparent—"Having tried the system, I have found it false." Words like these, uttered by any honest lips, I would feel myself called upon and bound to credit, and could only account for the discrepancy in our experience by supposing that he had been using either worse sulphurous acid, or a worse spray-producer, or been dealing with a worse class of patients than had fallen to my lot; or that the same bungling inexperience to which all of us are liable had been applying it in modes and in diseases quite unsuitable. The practical conclusion is, if you find from experience that you can combat disease sufficiently well with your present weapons, by all means continue; but as for myself, sooner would I retire from that profession which I love, and in which for nearly thirty years I have found windpipe and chest affections difficult to conquer, than think of proving treacherous to the welfare of my patients, by discarding from my weapons an arm of such tried and varied utility. Nor is this grand conclusion at all affected by such a trivial objection (sometimes urged) as that my style is that of an enthusiastic partisan instead of a sober medical writer. This objection may affect one's character as a writer, but cannot touch his veracity as a man. The style is that of a faithful witness-bearer notwithstanding, who in rushing into print perhaps acted imprudently in firing off his shots with little regard to anything but truth. While admitting my theories (if the reader can find any) liable to challenge, and holding myself ready to alter or correct them should good reason be assigned, I cling to facts as the ground of my appeal, and hold myself responsible for every one alleged in the pamphlet. And why after all should enthusiasm be condemned if the cause be good? In this world of ours was anything grand ever done without it? Did frigid argumentation abolish the Corn Laws, a mere cranium philanthropy strike the fetters from the slave, or orthodoxy, starched, stately, and precise, ever give forth a cry of earnestness that could disturb the tympanum of a drowsy world?

That the pamphlet should have appeared in a popular form instead of the pages of a medical journal is probably a blunder, giving rise as it has done to some popular effervescence, and flooding the market with many trashy appliances, which in ignorant hands are fitted to bring the whole system into discredit. With human nature as it is, such evils are almost necessary concomitants of every step in advance, which time alone can be expected to cure. Vaccination was surely a great discovery, though not till recently was any old matron who chose to practise it debarred from trying her hand at the operation. And in moorland districts far away from

any medical skill, why should the farmer or the lonely shepherd not be allowed to check diseases in the bud, either in his family or his cattle, by every appliance he finds useful for his purpose? In all our colonies what may the spray-producer or inhaler not accomplish for the squatter in the bush, the woodsman in the wilderness of our Canadian forests, or the tenants of the remote Australian prairie? The truth is, the profession may expect a time (and who knows how rapidly it may be approaching?) when many things required of it now may be done by others,—a time when diseases heretofore found intractable by the best physicians may be forced to yield to weaker hands; when all epidemics may be stamped out of existence, as some of them have been well-nigh done already; when bleedings and amputations and surgical operations of every kind will form the exception rather than the rule; when disease as a thing ashamed shall hide its head, and streams of health, blending their waters with streams of righteousness, shall roll down our streets like a mighty river, to flow forth for the purifying of every land. As old revived gospel truths, long hid by the mists of darkness and superstition, shall certainly have one part of this work to do, so valuable revived medical truths, fished up from the dust of ages, and hitherto ignored by the wisdom and self-sufficiency of many generations, may have another. Now of all such forgotten medical truths nothing can be more clearly established than this, that among all the lists of therapeutic agents employed by sage physicians in every age (who had no idea of parasites and fungi, septicides and septicimeæ, anti-catalytics, and all the rest of it), none had a wider range of application, or compelled a firmer faith in its virtues, than cheap, despised common sulphur, either as a 'balsam' or 'sulphur fumes.'

This record of my experience, then, I fearlessly commit to the profession and the world, to fight its battle or to find its grave, without further note or comment from me; but fortified by the knowledge that as a record of truth, '*magna est Veritas et prævalebit.*'

R. P.

BIGGAR, 27th *February* 1868.

Practical Hints and Suggestions

To Those Beginning Sulphurous Acid Medication.

How to Fumigate.—Put on a Kitchen Shovel a small piece of waste paper, on the paper half or a whole tea-spoonful of Sulphur, and ignite with a match. This process should be repeated every fifteen or twenty minutes, till the patient has had one hour or two hours of fumigation. It is a great mistake to hold one's head over the burning dish, or to make the fumes so disagreeably strong as to excite much coughing and sneezing. One's own bedroom, with a fire in it in an inclement season, is the best place for the evening fumigation; and exposure to cold should be avoided for some time afterwards. Instead of Sulphur, a succession of Pastilles may be used.

To Cure a Common Cold.—For stopping of the nostrils give a few whiffs of Spray first up one nostril and then the other. In Coughs and Hoarseness begin with a few whiffs into the chest, and follow up by an hour of fumes at bedtime; or, instead of spray and fumes, let fifteen minutes' use of an inhaler be adopted at bedtime.

Earache, Deafness, and Singing in the Ear.—When these arise from cold, the first Spraying generally gives great relief. In deafness from cold let the patient first try the hearing power by means of a watch, give a little spray into the ear, and in ten minutes apply the watch again : a *manifest* improvement may sometimes be noticed even in cases of some years' standing. The operation may be repeated every second day.

Chilblains and Aching Corns.—If the skin be unbroken, apply a piece of lint wet with the strong Acid, and cover it over with oiled silk all night. If the skin be broken, proceed in the same way with the Acid considerably diluted with water, to which a little Glycerine may be added. *N.B.*—Chilblains and Corns should be well soaked in warm water before applying the Acid.

Sore Nipples.—Simply soak the part well with strong acid for a few times, and don't wash off, as it cannot injure the child's mouth.

Hooping Cough.—While keeping up a mild taint of Sulphur fumes *almost constantly* in the sick-room seems to reduce the duration of the cough from months to weeks, other means should never be neglected: such as mustard blisters, laxative medicine, or a stimulating liniment to back and chest.

Sore-Throats.—Let a medical man, who doubts the value of Spray, try the following experiment. In any case of sore throat (even a suppurating one), where the power of swallowing is nearly gone, first ask the patient to swallow a little water, give eight or ten whiffs of Spray from good Acid, and try his power of swallowing again. The result, if unexpected, is likely to astonish. A few breaths from an inhaler are equally effective.

Asthma and Croup.—Having detailed cases of these in the Pamphlet, I only observe here that, in Asthma especially, the Spray should be administered very mildly and cautiously at first, as it never fails to aggravate the cough, and increase the breathlessness, before the patient finds relief.

Sulphurous Acid.—Glass stoppers to the bottles are of great use in keeping the Acid fresh and strong; or in

lieu of them the bottles must be well corked, laid on their side, and kept in a cool place.

Recent Cuts and Wounds.—First soak the parts with strong Acid till bleeding ceases, then apply a piece of lint wet with the same. When oiled silk is used as a covering over the lint, the Acid may be diluted with two parts of water.

I.—Modern Testimonies.

1. *Discussion in the Liverpool Medical Institution, Jan.* 9, 1868.

Dr. H. TAYLOR made some remarks on the use of Sulphurous Acid in a gaseous and liquid form. He alluded to two pamphlets which had appeared on the subject, by Dr. Dewar and Mr. Pairman, from which he read extracts. They had used it in cases of affection of the throat, croup, diphtheria, bronchitis, phthisis, typhoid fever, etc.: the two modes in which it was used were fumigation and the spray. Dr. Taylor invited investigation on the subject.

Dr. CARTER had made some observations and experiments upon its use. He had succeeded in curing a case of *sycosis menti*, but had tried it in *eczema* with no benefit.

Mr. BANKS had found it useful in the form of spray in cases of putrid sore throat, and as a fumigation in chest affections, attended with night cough and difficulty of breathing. There was generally considerable relief to these symptoms. At first it produced cough and expectoration, but the patients afterwards passed a better night.

Dr. GEE alluded to the advantages of inhalations generally in chest affections, and had found much benefit from a mixture of chloroform and turpentine, and also from carbolic acid.

Mr. HAMILTON had used sulphurous acid as spray in some cases of diphtheria with marked benefit, the severity of the symptoms being checked, and the local appearances improved. He had also found benefit from it in cases of phthisis, in relieving cough and diminishing expectoration.—(See the *British Medical Journal*, Feb. 1, 1868.)

2. *Dr. James Wilson*, Cullen, N.B., writes on diphtheria :—"From the month of August 1862 to the 11th of January 1868, I treated in all 19 individuals affected with diphtheria; of the 19 attacked 10 died." *Note*.—These cases (having fully 50 per cent, of deaths) were all treated in the usual way as recommended by Dr. Jenner, etc. Dr. Wilson proceeds to say, that, since the 14th January 1868, he had changed the treatment to sulphurous acid spray and fumes; also doses internally, with wine and tonics when there was much debility. In this new mode he had treated 18 cases with the following result :—2 deaths, 2 still under treatment, and 14 recoveries. "In one of the fatal cases, the larynx was thoroughly involved, and death impending before any remedial agent was employed. My patient in the other fatal case caught cold on the fourth day of his illness, when the disease appeared to be on the wane. Some of the cases included in the 14 who recovered presented before treatment most formidable symptoms. . . . I was extremely averse to Dr. Dewar's method, and somehow perversely prejudiced against it. I had made up my mind to lose at least one of the two bad cases, and tried Dr. Dewar's method from mere curiosity. I was thunderstruck at the vast improvement. The whole throat seemed perfectly remodelled at the second application of the spray, and from that moment I dated the commencement of recovery and the rescue from death."—(See *Banffshire Reporter*, 21st February 1868.)

3. *Dr. Charles J. B. Williams*, Consulting Physician to the Hospital for Consumption at Brompton.—"I have found the spray (of sulphurous acid) a most useful and agreeable remedy in various affections of the throat, whether diphtheritic or aphthous, and it has proved cleansing and soothing in some cases of foul ulceration of the throat, affecting both larynx and fauces, generally syphilitic in origin, and sometimes ending in pulmonary consumption." Dr. Williams' experience as to the use of sulphurous acid in consumption is too limited to admit of any expression of opinion. But he greatly approves of the inhalation of various remedies in combination with steam, such as creosote, carbolic acid, iodine, etc., as "really useful in certain cases, chiefly those in which the larynx and trachea are much affected, and in those attended with convulsive cough or offensive expectoration." *Note*.—As nothing but temporary relief can be expected in confirmed consumption from inhaling either sulphurous acid, carbolic acid, or any other medicated vapours, it is much to be regretted that this eminent medical authority (perhaps inferior to none living on consumptive diseases generally) does not seem to have tried sulphur fumigation, persistently carried on in the early stages, and given the profession the benefit of his opinion as to the power of the remedy to check the disease or at least to remove coughs of long standing apt to end in confirmed consumption.—(See Dr. Williams' Paper on Pulmonary Consumption in *Lancet*, 15th August 1868.)

4. *Dr. Henry Lawson, M.R.C.P.E., etc., of London, one of the editors of the* "Practitioner."

Dr. Lawson has found fluid sulphurous acid, administered internally, of great benefit in pyrosis or water-brash. Dose: Half or a whole teaspoonfal, in water, three times daily, shortly before meals. "The very

remarkable cures," writes he, "recorded by Dr. Dewar and Mr. Pairman, as having been effected by the use of pure sulphur vapour, led me to give sulphurous acid a trial in cases of pyrosis, and certainly the result surprised me. *In every instance in which it has been employed, it has in a very short time completely arrested the water-brash secretion*. Indeed, it has given me so much confidence in its valuable action, that I now never hesitate to assure the patient he may very soon hope for relief from at least the distressing symptoms of pyrosis." In answer to the question, "What is the explanation of its action?" Dr. Lawson thinks it is in its power of destroying parasitic germs. "The reason why sulphurous acid is so beneficial, is simply that it is a parasiticide. I have made numerous microscopic examinations of the fluid of pyrosis, and in nearly every instance I have detected not only *sarcinæ:* and *torulæ*, but huge clusters of *leptothrix*, and myriads of *vibrions* and *bacteria*."—(See the *Practitioner*, a Monthly Journal of Therapeutics, Sept. 1868.)

5. *Extract of a Letter to R. P., dated "Glasgow, 28th Dec*. 1867."—"Having read in your pamphlet that the gas was beneficial in cases of ulcers, and knowing a man who had been laid up for a long time with a 'bad leg' of that kind, I thought I would try it. The nest time I went to visit him I took a box of sulphur pastilles in my pocket, and, as both the man and his wife had severe colds, burned one of the pastilles while there, making them inhale the fumes, and left another, with instructions that the man should hold his leg over it while burning. I also told him to get some common flour sulphur, and use it in the same manner. (I find that he did not get this to burn, having mistaken the way, so that the cure is altogether through the pastilles.) This was on Tuesday the 17th inst. Last night I went back to see him, and found that *since he had used the pastilles his sore had completely dried up*. It had never been so since the month of February. The colds also had quite disappeared."

6. *Antagonism between Sulphurous Acid and Fever Poisons*.—A rector in the Episcopal Church of Ireland writes me (Jan. 28, 1868) that the parish of St. Mary, Kilkenny, (of which he was for eight and a half years minister,) is out of sight the poorest, most dirty, and most wretched of the whole town. But instead of that parish being a hotbed of fever, as one would naturally expect, *it is in a great measure exempt*, even when fever is prevailing near it. This he attributes to the extreme poverty of the parishioners, who cannot afford to use the same fuel as the other inhabitants, but have to content themselves with a cheap inferior coal, the produce of the county, *which is full of sulphur*. In visiting the houses he sometimes "found it hard to breathe in the room with it." Nothing can illustrate more strikingly than this the importance of adopting stated fumigation in all private dwellings during seasons of epidemics.

7. *Dr. Dewar writes thus* :—" J. P. had been ill for weeks before I saw him, his breathing difficult, and his efforts at expectoration almost fruitless. I persevered, pumping the spray at intervals for some twenty minutes, until his chest was relieved and almost noiseless. Next day this was repeated, and in a few days he was at work."—(See Pamphlet, page 35.) Again, under Asthma and Bronchitis, page 34 :—"In whatever stage I find my patient, I at once proceed to apply the spray, which, by loosening the expectoration, facilitates its expulsion, so that the chest can be wonderfully cleared of it in a few minutes."

8. *An eminent Physician in London observes* :—"I find the spray very successful in cases of sore throat, especially inflammatory, giving almost immediate relief."

II.—Hints on Rinderpest.

If the principles contained in the preceding pamphlet be correct, and sulphurous acid be destructive to all contagious morbific germs, what a weapon has Providence put into our hands (if men would only use it aright) to mitigate and prevent epidemic diseases! As Rinderpest is at present rife in some parts of the world, the following hints as to the use of this weapon may not be out of place :—

Like other contagious diseases, this terrible scourge arises from the reception into the system, and fermentation in the blood, of a virulent poison. However difficult to cure, the evidence seems encouraging that it is comparatively easy to prevent any such plague coming nigh our dwellings; all that is necessary for this purpose being to attend to cleanliness and ventilation, and to fumigate the cattle statedly with sulphurous acid gas, which is formed by burning sulphur or a sulphur pastille in the air. Indeed this is not now a mere theory, but having been practically tested in many cases, may almost be considered as an established fact. Sulphurous acid has this advantage over other disinfectants, that by absorption into the blood it proves a tonic and restorative in cases of weak vitality, and therefore many farmers use it regularly irrespective of any prevailing epidemic, to purify the blood, and bring their cattle into a healthy and vigorous condition. In warding off epidemics it seems to act both *within* the organism and *without*, by killing at once all contagious effluvia, and fortifying the system to resist their power.

Even when sulphurous acid is introduced into the system in another way, *i.e.*, through the medium of the stomach, by administering in the form of drink the various sulphites, hypo-sulphites. or bi-sulphites, the preventive power of the antidote remains the same. Professor Polli of Milan found, by direct experiments on

animals, that these salts of sulphurous acid entered the blood, impregnated all parts of the body, solid and fluid, and enabled the animals thus medicated to *resist the action of septic poisons of all descriptions*. As these salts owe their virtue to sulphurous acid, and not the soda or potash, etc., with which it is combined, what a powerful evidence do these experiments supply, that sulphur fumigation must prove an antidote for those septic poisons to which the virus of Rinderpest belongs!

During the late outbreak of Cattle Plague in England, and before the simpler plan of fumigation became fully known, numerous stock-owners, on the recommendation of Dr. Wilkinson of Sydenham, used as a preventive hypo-sulphite of soda dissolved in water with extraordinary success. Thus writes Mr. J. T. Noakes of Brockley Hall, Lewisham, in the *Times* of February 21, 1866, that he had tried this method "for four months with most perfect success. . . . . My herd consisted of high-bred short-horns, and ordinary farm-stock. The disease first manifested itself among the latter, having been conveyed, it is supposed, on the clothes of a man who had been in company with infected animals on another farm where the cows all died. . . . . My herdsman treated *only a portion of the high-bred animals* with Hyposulphite. These, although no provision for isolation was attempted, *escaped contagion*, while the remaining portion of the well-bred and the ordinary stock, which had not been subjected to the treatment, *all died*. The specific is simply Hypo-sulphite of Soda, five pounds dissolved in one hundred gallons of water, given as the ordinary drink of the cattle. I have received letters from gentlemen who have tried this treatment by my recommendation, all of whom confirm its efficacy, etc."

Concerning this same hypo-sulphite, a clergyman near Newcastle writes me (17th April 1868),—"During the course of the Cattle Disease, the cow-keepers about here invariably used this drink, with the exception of one farmer. They all escaped; while he suffered a loss of about £600."

If saturating the blood, then, with sulphurous acid (even when introduced through the stomach) form an antidote to the poison, how much more effectual must fumigation be, which both impregnates the blood, destroys malaria in the cattle-shed, and disinfects the clothes of all attendants, and how much simpler in its application! The following extracts speak for themselves :—

Dr. Dewar writes: "Although Cattle Plague, like all other epidemics, is admittedly capricious in its course and progress, it is as reassuring as it is gratifying to be able to state that, out of scores of homesteads where the system has been, from first to last, *thoroughly and determinedly practised*, there has not been, as far as I have been able to learn, any case of illness, not to say of death, among cattle from any epidemic whatever."

Again, "My own cattle have been thus treated for nearly four months, four times a day, and hundreds of others likewise, to their manifest enjoyment; and many of my friends and correspondents are so satisfied of the general advantages arising from its use, that they have intimated to me their intention of continuing the practice, irrespective of the existence of any special epidemic. That exposure to the fumes directly, as well as indirectly, conduces to the animal's health, all of them admit; and the 'blooming condition' of those which have had the benefit of it, is of itself sufficient evidence of its hygienic virtues." (*Pamphlet on Sulphurous Acid*.)

While we seem justified in stating that fumigation, systematically and persistently practised, will certainly *prevent* Rinderpest, it might be rash to predict that, combined with the sulphurous acid salts internally, it will go far to *cure* even in affected animals. But we humbly suggest this method as worthy of a trial, as a basis of treatment, conjoined with such general treatment as the veterinary surgeon may direct. For if the disease essentially consists of fermentation in the blood, and sulphurous acid be the most powerful agent known in arresting fermentation in other matters, as wine, malt liquors, lime juice, and dead meat tending to putrefaction and decay, why should not the same agent, by entering the blood, arrest a similar process there? Two facts make us hope that this plan, early and vigorously adopted, will *cure* Rinderpest as well as *prevent* it.—1. Because in fumigating with sulphurous acid for pleuro-pneumonia, where no separation was made between the healthy and diseased, instances are recorded where not only the healthy were screened from infection, but the diseased recovered by the same process as well. 2. Because an old despatch, now probably forgotten, from Her Britannic Majesty's Consul at Odessa, dated 24th November 1865, mentions as a cure for Rinderpest, "Drenches of warm milk in which garlic has been boiled." Now garlic is virtually sulphur, of which element the oil is a chemical combination, and to which it owes its pungent odour; as will be seen by consulting the pages of Fownes, Lardner, and others, who, in enumerating the various "Sulphuretted Oils," include those of Black Mustard, Asafœtida, etc., and *Garlic*.

R.P.

September 19, 1868.

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In the Lecture Room of the Museum, During the Second Session of 1871. Published Under the Direction of the Committee.
Samuel Mullen Melbourne 55 Collins Street East. MDCCCLXXII.
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Contents.

Introductory Note.

THE Third Series of Lectures delivered in the Lecture-room of the Industrial and Technological Museum, Melbourne, is now offered to the public.

The Committee desire to express their thanks to the gentlemen who, by their lectures, have assisted the Committee in their efforts to promote knowledge in Science and Art.

INDUSTRIAL AND TECHNOLOGICAL MUSEUM,
17th May, 1872.

The Geological Action of Fire.

This lecture is printed from the reporter's notes, as revised by Professor M'Coy.

A Lecture, DELIVERED BY Frederick M'Coy
(*Professor of Natural Science in the University of Melbourne, Director of the National Museum, and one of the Technological Commissioners*),
On 21st September, 1871.

THE subject selected for this evening is the geological action of fire. It is particularly desirable to have a clear knowledge of this powerful geological agent as preliminary to almost all geological study. You will find that the most simple and elementary parts of geological research require some knowledge, and tolerably exact knowledge too, of the way in which fire acts in its geological relations both to the structures of the great rock-masses, and the general conformation of all the older rocks—from which those less old have been subsequently formed, by various mechanical and chemical changes.

I have placed a number of rock specimens on the table, which furnish good examples of all the more ordinary "Igneous Rocks," as they are termed, and they show the comparatively few mineral ingredients of which all the rocks manifestly formed by the agency of fire are composed. If you examine these carefully when you have more leisure and better light, in the day-time, you will find such study by the eye greatly to facilitate your advance in geological knowledge, particularly of that portion of it called "Lithology," which may be taken in any point of view as a necessarily preliminary portion of all systematic practical geological investigation.

The most important study as to the direct action of fire, in a geological point of view, may be made in the various localities of the earth affording examples of what are commonly called "active" volcanoes, such as Vesuvius or Etna.

In all eruptions of active volcanoes, you have in distinct action this great geological agent, actually forming before your eyes a number of rock-masses of almost all the varieties of the newer kinds of igneous rocks, under circumstances and peculiar local conditions which are seen to be capable of producing great differences in the general appearance of the different recognised kinds from a nearly uniform material; a fact readily to be understood when you see these causes producing the effects during an ordinary volcanic eruption.

In existing volcanoes you find the most universal characteristic is the outpouring of great rock-masses in a melting condition, or of pulverulent, dry, dusty, or cindery masses mineralogically identical with them, from the volcanic craters. It is a matter of great delight to the geologist to find that the melted rocks which he sees thus flowing out from the interior of the earth, and cooling and solidifying almost under his foot—that these rock-masses forming under his eyes are identical with those he finds in the earlier periods of the world's history,

forming great thicknesses of the earth's crust; so alike, in fact, that it is in many cases almost impossible to tell one from the other.

On looking at any ordinary volcano, as, for instance, Vesuvius, which we have sketched here on the black-board, you commonly see the appearance here represented and described by old Italian geologists as resembling a pine-tree, that sort of pine-tree you see in Turner's Italian Landscapes, being apparently a narrow cylindrical column of smoke rising from the aperture at the top of the mountain to a great height, and then spreading out like an Italian pine, or an umbrella, or mushroom. This is not really smoke, but a mass of pulverulent fine dusty particles of the very common minerals which compose the great flows of melted "lava," as the boiling rock which pours down from the craters is called.

These dust-like particles, composed chiefly of minute crystals of igneous minerals, get into the higher regions of the atmosphere, and are carried by currents of air sometimes hundreds of miles over the land or out to sea, where, as they gradually fall, they constitute rock masses which were excessively puzzling to the older geologists, having the mineral and physical constitution of igneous rocks to the eye, but often containing the remains of shells, or bones of quadrupeds, if on land; or fishes, corals, &c., similarly entombed at the bottom of the sea; whereas such remains would be utterly destroyed by a heat far less than that necessary for the production of the material composing the rock-mass. These submarine volcanic rocks are, however, so little popularly known that I need not dwell on them further than to point out that geologists recognise them as due to volcanic action, and that these volcanic ashes are found interlaminated in great beds through Snowdon and other large mountains in North Wales; for instance, in Russia, in North America, and in Canada, &c.; the term trap-ash being often applied by modern geologists to such igneous rocks deposited from suspension in water or from the air on land.

There is another igneous rock formed in nearly the same way, to which Italian geologists give the name of "*peperino*" and this is abundantly distributed over the country in the neighbourhood of active volcanoes. When an eruption takes place it is commonly accompanied by violent thunderstorms and heavy rains. Now, when we consider that the clouds of apparent smoke issuing from the craters are in reality great clouds of fine dusty materials, you can readily conceive that the raindrops falling through such dust would be coated over like pills, and come down somewhat in the shape and size of peas, forming a peculiar mass over the surface of the earth, to which, as I have said, the name of *peperino* is given, and having a strange analogy in many respects to the volcanic deposits occurring in the bed of the sea; inasmuch, for example, as this *peperino*, and the ashes brought down with it through the air, will very often appear stratified as if it had fallen through the water, and cover over field-mice and other small quadrupeds, birds, reptiles, &c., on the land, and other living creatures in small accumulations of fresh water on the surface, which in this way become embedded on the land in great quantities, although they certainly would have been utterly destroyed if the rock enclosing them had been at the time in a condition of igneous fusion.

The same thing pretty nearly occurred at Herculaneum and Pompeii, where a great overflow and outburst of volcanic mud, mingled with a large quantity of water as it came from the mouth of the volcano itself in the case of the one city, and showers of hot ashes in the other, entombed works of art and human bodies so rapidly, and preserved them so completely intact, from the first century of the Christian era down to our own times, that we can study their social peculiarities almost as perfectly as if they were of yesterday.

I mention these two kinds of igneous rocky material in the first instance because they are so unlike all the other and commoner kinds, although related in composition; and having so spoken of them, we may now consider the commoner kinds by themselves. In nearly all existing volcanoes, the commonest rock which is thrown out resembles the lump now in my hand, looking very much like a clinker from the furnace, or a large cinder. It is to this vesicular kind of stone that the term "lava" is generally applied. It is generally composed of two minerals—one, the commonest of all minerals in igneous rocks, felspar; the other, the black mineral augite, of which there are several specimens now lying before you. These two mineral materials may be readily melted in a blacksmith's forge at the heat melting ordinary pig-iron.

If this melted rock happens to flow over the surface of a level country, it almost invariably presents this appearance like petrified sponge, due to the great number of little holes in the stone caused by the air, steam, and other elastic vapours of various kinds given out with the melting stone, and expanding according to the shallowness of the quantity of stone flowing over the surface, forming large bubble-like holes when the pressure is small, but becoming small or imperceptible as the pressure increases with a greater thickness. But here before you is a much heavier stone, and perfectly compact, called "basalt," very unlike the vesicular lava in appearance, but which you would, on minute examination, find really identical in mineral composition. If the lava, instead of flowing over a flat plain, happened to get into a confined space, such as a narrow valley or river-course, where to a considerable depth it might be jammed together, you would find that in the lower part of such a mass the holes were not to be found, but that the stone became one of the most compact, toughest, and heaviest of rock masses with which we are acquainted—basalt; and at greater depths, producing greater

pressure and slower cooling, the separate minerals would crystallise in separately recognisable portions, forming greenstone; the dense rock and the crystalline one and the vesicular lava being identical in composition; the differences being caused by pressure and the rate of cooling.

There are other great extremes due to exactly the same causes. If the cooling be much more rapid than that commonly producing lava, you get the *bimstein* of the German lithologists, the pumice-stone used by painters, excessively light, often floating in water, but still perfectly identical with the heavy rock masses with which we have been dealing, the only difference being the greater quantity of air cavities in it, surrounded by thin envelopes of rocky matter, caused by such a mass being thrown up rapidly in the air to a great height, and the consequent rapid expansion of the gases contained therein. Another extraordinary difference may be produced in the same way. I have in my hand what looks like a piece of common bottle-glass—ordinarily called "obsidian," or "volcanic glass"—of a dark greenish black colour, translucent on the edges, and with a conchoidal fracture, and so nearly resembling, as I said, black bottle-glass, that in Wales and some parts of England a very good trade has arisen from making bottles by melting a stone like what the Melbourne builders call blue-stone, and cooling it suddenly so as to form this material. Yet it is perfectly the same in its composition as the vesicular lava, or pumice-stone, or basalt, or greenstone, which I have brought to show you, merely differing in the fact of having been still more suddenly cooled. Our bluestone is only another form of this rock-mass, having the same components—felspar and augite—and from which you pass insensibly to the hard black basalt, or if the cooling has been still slower, to another change, as in this stone I now show you, to which the name of "greenstone" is often applied, and where the constituent minerals separate themselves, the felspar forming little crystals by itself, and the augite or hornblende another series of crystals by itself; and in the different "bluestone" quarries about the town—as at Richmond, for instance—you may see all these varieties in unbroken masses of stone, some vesicular, some crystalline, and some dense and forming prismatic basaltic columns, like those of Staffa or the Giants' Causeway, on a small scale, and occasionally the glassy form.

If the cooling be moderately slow, it gives rise, under certain conditions in the same rock-material, to another set of rocks, of which porphyry is the type, in which some one of the materials forms large crystals, imbedded in a general mass composed of smaller crystals, or of a massive compact character, the material of the crystals being generally the felspar.

(*The lecturer here exhibited and explained a great variety of rocks in detail*.)

The general fact, then, established by investigation of volcanoes is, that if all these materials were mixed together and united in the interior of the earth, the many very different-looking igneous rocks would be formed, merely as the results of the different rates of cooling of one and the same stony mass. In all the older geological times the same variety of material has been certainly produced by the same cause—that is to say, by the rate of cooling from the state of fusion due to the intense interior heat; but besides this you find that some extraordinary generalisations present themselves, of great interest to the geologist, from the constitution of the igneous rocks formed at different periods of the earth's history. As a general rule, the very oldest igneous rocks present a considerable portion of the mineral quartz, but this quartz is excessively rare, or not present at all, in the more recent volcanic rocks flowing from active volcanoes.

Another mineral in the ancient igneous rocks is mica, which, like quartz, is also as a general rule very rare in the more recent ones. There are several ways of accounting for the different mineral composition of the igneous rocks of different ages, but let it be here borne in mind that the general subject of geological age cannot be measured by years or historic periods, but by relative periods; and the various geological epochs are generally indicated by reference to the various formations of stratified or sedimentary rocks succeeding each other in the order in which they were deposited in the sea of old time; it being obvious that a lower bed of rock if so deposited in the water must be older than another above it, and so on, each of these groups of beds having a name attached to it, as the silurian, the oolitic, the chalk, &c., represents the period of time occupied in its formation; and although people may differ as to the number of years any geological formation may have taken, there is no difference of opinion as to the *relative ages* referred to by the names of the formations.

The great series of geological beds of rock representing geological times are found as a general rule to rest on a basis of igneous rock, frequently that which is represented in a diagram before you as lying underneath all the bed-rocks, and to which the name of "*granite*" is given, in which the scaly mineral *mica* is excessively abundant, and the mineral quartz is also more abundant than in any other igneous rock whatever; these two, with felspar, are the principal components of granite.

Now, quartz and mica require an extremely intense heat to allow of their fusion and crystallisation, greater in fact than we can produce artificially, although of course they were thus originally fused.

According to the theory of Professor Abich, the materials of all these rocks which you see here depicted on these diagrams before you, were originally fused in one great melting mass; and when that mass in cooling first began to solidify, you can conceive that if all the mica, quartz, and felspar were in that seething mass, the first

thing to solidify would be that which required the greatest heat to melt it—the quartz, then the mica, would solidify or crystallise first, as they are much less fusible than the others; and thus, from this infusibility of the two principal materials you would necessarily have granite as the first rock product of the cooling earth, with nearly all the quartz and nearly all the mica of the general mass, mixed with felspar, which although very fusible would probably be entangled with the others. This would explain why *quartz* and *mica* abound more in the ancient igneous rocks than in those of more recent formation resulting from the cooling of the remainder of the constituents. There is an interesting point to bear in mind here, that you should count the age of such igneous rocks in the opposite direction to that of those deposited on the bottom of the sea; the bedded rocks, as they are called, naturally becoming newer as you .approach the surface; whereas it is obvious, according to the theory we are considering, that under a crust of granite first formed you would then have the materials for another crust, say of greenstone, in which there would be no quartz, but a great deal of felspar and hornblende; then, probably, still lower a series of porphyries and trachytes, with still more felspar, then basalt, and so on.

Professor Abich was the first to draw attention to the fact that the most modern of these rocks are excessively dense as compared with the older igneous deposits, and he points out that, after the granite had abstracted all the quartz and mica, leaving the ordinary constituents of the trap rocks, there would be a tendency in the melted rocks below to range them selves according to gravity, the heavier ones having a tendency to sink to the bottom, thus explaining the fact of the basalt rocks coming up to the surface of the earth after syenites, greenstones, and other nearly allied kinds, which we find more abundant in the older and middle periods of geology.

I have dwelt longer than I meant on this part of the subject, but it was necessary to do so before proceeding to speak, as I now will, on the characteristics of volcanoes.

When you examine existing volcanoes, you find that, although situate in very different localities, they differ but very little from any one type you may take as an example, and so nearly all the old instances of outbursts from below or within the earth of molten rocks would be found to have followed almost exactly the parallel characteristics of those of the present day.

Suppose, then, we consider the character of Mount Vesuvius, as here depicted in this long drawing, and which furnishes a very good example of the characteristic form of nearly all ordinary volcanic vents or craters, as generally formed.

Of the ancient crater of Vesuvius, the portion remaining, and called Monte Somma, is about 4000 feet high, having an irregular, broken, sharpedged outline. The earlier physical character of this was a great circular valley, as you see here drawn, with a sharp serrated edge higher on one side than the other, but very precipitous, highly inclined on the outside and almost perpendicular inwardly. Below this extended a nearly level plain, on which a few flocks were fed; but there was no record of the igneous character of the mountain, nor even the slightest idea of its real nature, until the first century of the Christian era—not even a tradition of activity of any kind, until the occurrence of a very violent earthquake, which damaged several neighbouring cities; and then, after a succession of alarming shakings, a final one occurred in the month of August, A.D. 79, accompanied by a sudden explosion and bursting out of the whole of the central part of the valley, giving vent at once to an enormous shower of red-hot ashes, cinders, and *scoriæ*, as also of great streams of volcanic mud, entirely overwhelming the great cities of Pompeii and Herculaneum, the remains of which travellers can now examine at their leisure, the eruption preserving, at the same time that it buried them so completely as to form a level plain above the tops of their highest buildings.

From that time to the present the volcanoes of Italy have remained active. But the portion of Vesuvius now generally chosen for volcanic study is a small crater called *Monte Nuovo*, which arose in the year 1538 to a height of about 430 feet from the base of the original *Monte Somma*, and having a circumference of 8000 feet. It rose in about two days, and forms an inner cone in the centre of the great original one. I wish particularly to draw your attention to a general character of almost all volcanic craters in the world, represented in the drawings before you. You see the sides coming up with a steep slope, very nearly at that particular angle which is known as "the angle of rest," an angle you can imitate on the sea-shore or elsewhere by letting sand fall from your hand till it forms a small heap, the term being applied to the invariable degree of inclination that sand or other similar material would assume under such circumstances—the slope at which the grains would have no tendency to roll down to the lower part of the heap. Recognising this particular slope is of great importance in the recognition of the existence of volcanoes in various parts of the world, and is intimately connected with the formation of these volcanic cones.

When a section is made through a volcanic cone there is an appearance, as you see in the diagram, of beds sloping at the same angle or nearly so as the outside of the mountain, which beds are composed of layers of *peperino*, pumice stone, vesicular basalt, and other stony material, forming a series of deposits apparently sloping in every direction from the centre.

Baron Von Buch, in an elaborate treatise written by him on craters and their elevation, supposed these

appearances to be indications of a series of horizontal beds thrust up in the centre by some great force acting from below that centre, and his term "crater of elevation" indicates his theory of the formation of volcanic craters by such influence.

But the real fact is, if you consider for a moment such an opening as this, in the middle of the plain, continually throwing up stones and ashes for ages, such ejected materials falling, as I instanced just now, like sand from the hand, the result must be a conical hill, with precisely the angle you find here, viz., the angle of rest. When you can get a cause in this way capable of producing a given effect, it is a safe plan to refer such effect to such cause, instead of to one of a less applicable kind.

When these cones are formed in this way, the occasional overflowing, during eruption, of the melting lavas rising in the crater, and flowing over in sheets from the top, will give alternate thicknesses of different kinds of rock, producing the different layers of stone, ashes, &c., observed; and all the best geologists are now agreed that Von Buch was in error in applying his theory of elevation to most craters.

Having drawn your attention to the peculiar angle of the side of a volcanic crater, I will now point out another characteristic of form of all existing active volcanoes.

Having mentioned that *Monte Somma* was much higher on one side than the other, so I may inform you that *Monte Nuovo* presents exactly the same appearance, the top of the crater being obliquely truncated and the lower side broken through, and thereon comes the explanation of why one side is lower than other. You will find, when you consider it, that in such a cone as this, with melted rock below seeking a vent, forced up through this long pipe (as it appears in the diagram) towards the summit, every addition to the height of the column enormously increases its bursting power, and when at last it becomes of such a height and power that it can be contained no longer, it bursts out on some one side or the other (usually that towards the general fall of the country); and whichever side it is that gives way, there is a great fracture inside, through which the current of melted rock is run out to the lower levels. You may recognise in many countries of the world, by these peculiarities of form, many hills of the nature of true volcanic cones, notwithstanding that they have long ceased to be active. There are in this colony many of them of a most perfect kind—the same outside slope, precipitous near the edge, and an oblique truncation of the hollow top of the cone (sometimes containing a small lake), and in the broken lower side you find traces of the overflowing current of melted rock which has produced that peculiar form. A beautifully perfect one, just like some of the extinct volcanoes of the Rhine or Auvergne, may be seen at "Jim Crow," or Mount Franklin, near the native station.

Studies of this kind led a number of French geologists, followed by Mr. Paulet Scrope, the famous English one, to the discovery of a great number of extinct volcanoes in Auvergne. In Central France, and Auvergne particularly, you find such appearances as these conical hills, with just this angle of rest, and formed of *scoriæ*, ashes, &c., and rising to a sharp obliquely truncated hollow upper part; and from the lower portion of the top edge a great stream of basalt, 20 or 30 miles in length, usually found running down to some low level. You can see the same sort of thing at Mount Franklin, or Jim Crow (as it used to be called), in this colony. You also see hero the places in the broken lower summit from which the last flow of bluestone took place, with the flow marked by its having cleared its way apparently through the forest, and making its way with gum-tree forests on either side; the lava stream winding before you as far as eye can reach, but without a trace of vegetation on its course, and looking as fresh as if it was flowing yesterday, but which probably occurred in the later tertiary geological period of the old time.

Whenever the stream of lava, or a portion of it, gets into some cavity where it can cool more slowly, you often find the curious result of basaltic columns, of polygonal jointed prisms, as effect following the cause of such retarded cooling; as, for instance, in these illustrations before you of the celebrated Giants' Causeway and Fingal's Cave, in which you find a stone nearly identical to that (bluestone) which you find in many places going from Richmond to Ballarat in this country.

A curious experiment, illustrating this columnar formation on a small scale, has been made in England by Mr. Gregory Watt, and since repeated by others, by taking about seven hundredweight of common bluestone, there known as Derbyshire toadstone, and keeping it liquified in an iron-smelting furnace for eight days, then allowing it to cool slowly. He found the outside to be composed entirely of volcanic glass; then inside a mass resembling the rock to which the term pitch-stone is applied; then jasper; then a material nearly resembling basalt, without particular form; and then he found, a little within that, in the still more slowly cooling basalt, a tendency towards the formation of concretionary masses, producing, farther towards the centre, from their greater size, number, and mutual pressure, a series of prismatic columns, radiating from the central part towards the periphery, and jointed exactly as you see here represented in these delineations of the Giants' Causeway and Fingal's Cave. Dr. M'Culloch, in his work on the rocks of Scotland, pointed out that in some localities where these columnar jointed masses of basalt rotted or decomposed, the first parts to give way were the corners at the joints of the columns, this giving rise to an appearance, recognised by many writers, of a hollowed surface to some of the joints, with a convex rounded surface on others, as if they fitted into each other like cup-and-ball

joints. This very acute observer pointed out, that if the corners came off from the joints, and this process continued, the inevitable result at last would be that the whole of the angularity would be lost, and you would have, in fact, a series of spherical, concretionary masses, just like those produced by the experiment we have referred to; but, originally, concentric surfaces, compacted into this appearance merely by lateral pressure. The experiment clearly showed how this is produced, and you may trace the same action in some of the moving streams from Vesuvius at this day, stone assuming that prismatic character generally at right angles to the plane of cooling.

Several most important characteristics of igneous action may be found in Mount Etna. In the diagram before us we have a portion of the interior of the great cone of Etna, with a section of a lesser cone, showing an appearance of stratification, which is the result of successive deposits of lava and ashes; and at various places you see great basalt buttresses standing out through fissures in the sides of the mountain, forming portions of what are solid walls of stone, nearly vertical, and traversing the scoriaceous beds in various directions, and terminating above in great sheets extending obliquely downwards over the side at the height it had attained at that time. These are known to geologists by the name of "*dykes*"—great vertical veins of igneous rocks, apparently cutting through the geological formation of various portions of the earth, but really intrusions of melted rock, usually from below, filling up great cracks or fissures in the earth, but sometimes cutting those channels to flow in. Nothing is more common in the coalfields of England than to find a basaltic or "trap dyke" thus cutting apparently through the coal-beds, and showing the geological action of fire on those beds in the same way that the same coal would show the action of fire in the retort of the gas works—namely, by the distillation out of it of all the bituminous or gaseous constituents of the coal from near the dyke, where it is converted into cinders or coke; then, as you gradually recede from the dyke, you find that the mass of cinders, or clinkers, into which the coal is converted, becomes gradually changed into what is known as stone-coal, or anthracite, a kind of coal useful for many purposes, but remarkable for burning without flame, having no bituminous matter to produce it; and still farther off the ordinary character of bituminous coal is found unchanged. Similarly, dykes are often found traversing beds of dark, fossiliferous limestones, and changing them into snow-white, statuary marble, with a crystalline fracture like loaf-sugar, and destitute of petrifactions—changing them in the same way as great heat and pressure have been found to change such limestones experimentally. Thus, then, you find these appearances in Etna perfectly similar to those we know of in the oldest formations in the depths of the earth.

I now wish to draw your attention to a modification of the volcanic crater in the Sandwich Islands, as depicted here in the drawings before you, interesting from the difference presented from the ordinary forms I have already dwelt on.

It is obvious that for the production of active volcanoes you must have a large quantity of melted rock below the earth's surface, forcing up through craters, and spreading out in the different forms of rock I have briefly indicated to you; and in all volcanic and earthquake regions you must necessarily have this great molten subterranean supply. But very few of us could expect to see such a fearful sight as Dana made known in his description of the extremely different craters in the Sandwich Islands from those generally known.

In this drawing of the one of Kilauea you see a lateral cone at a much lower level than the great cone of the island to which it belongs, and acting as a sort of safety-valve. In the crater of Kilauea you find an enormous flat-edged opening in the crust of the earth (showing how very thin or insecure that crust on which we walk is), which seems merely an egg-shell-like covering over this vast area of seething fire below. In the middle of a great plain you see (as here depicted) a great hole, which is in reality several miles wide and long; looking down which you see the very unpleasant artistic prospect below of a lake of glowing, boiling rock, now rising to the brink so as almost to overflow, now sinking to a great depth. To give you some idea of the extent of this hole, it is suggested that if the whole city of New York were put down there it would be scarcely discerned. The whole of this is one vast boiling cauldron of seething rock, sometimes uprising near the edge, sometimes sinking for many feet, spurting out volumes of sulphur, steam, and other gaseous ebullitions; looking by day-light something like the pitch lake of Trinidad, but at night glowing of a dull red heat as far as the eye can reach.

The envelope of all this is almost a plain, with none of the acute angular, elevated, conical character of the ordinary craters; but there you see one of the very few instances that can be observed of a simple thin crust of earth, floating itself, resting insecurely on this enormous seething, melting mass of rock below, and which underlies so much of the earth on which we are dwelling in fancied security. Professor Dana describes how, while sitting on one spot in this plain, he saw the very place he had sat upon the night before crumbled in, melting immediately, and forming a portion of the fiery mass rising to the edge and then again subsiding.

This is, then, one of the very rare cases of a lateral vent connected with one about two and a half miles high, or more than twice the size of Etna, and which, with all the characteristics of the ordinary crater, occasionally gives outbursts of frightful volcanic violence, but seems to be continually relieved by the gentle

boiling up and down below. It is certain that when this boiling flood rises to a certain height it flows out laterally under the sea, and thus gives enormous relief to the seething mass within.

But time warns me that I am unable to dwell longer on the direct application to geological subjects of the action of fire, although the subject is but half-touched; and I must, therefore, now, with thanks for your attention, conclude for the evening.

The Geological Action of Water.

This lecture is printed from the reporters notes, as revised by Professor M'Coy.

A Lecture, DELIVERED BY Frederick M'Coy
(*Professor of Natural Science in the University of Melbourne, Director of the National Museum, and one of the Technological Commissioners*),
On 26th October, 1871.

ON the last evening that I had the pleasure of addressing you on elementary geology, the subject I endeavoured to bring under your notice was that of the "Geological Action of Fire," and of the many ways in which geologists recognised its agency in forming the great mass of the earth—the various rock masses which under certain changes of conditions constitute not only the interior or central parts, but the whole of the earth with which geologists have to deal at the present time; and we saw how all these variously modified rocks, am all these accidents of surface, hills and valleys, depended mainly on various effects, both chemical and physical, clearly and exclusively due to igneous action.

I showed you, that if you supposed the whole earth to be originally a molten mass, composed of mineral materials comparatively few and simple, that according to degrees of fusibility, density, and other difference of circumstances, certain of these materials, or igneous rocks, would cool first, the result would be the actual mineral composition you find in nature, for the oldest and most inferior in position of the rocks you have to deal with.

I then showed you that all the investigations that had been made by geologists into the mineral composition of the rock of the lower portion of the earth, and experiments made a to the various temperatures now perceptible at different depth in the earth's interior, all coincided in pointing out the fact of the original intense heat by which all the rocky materials c the earth had in the earliest times been fused, existing probably at first as mere gaseous vapour, then condensing into a gigantic liquid drop, revolving on its axis as it now does. I then pointed out that if you had this liquid mass twirling round on such axis at the speed that we know the earth does so revolve, then in virtue of the molten condition of every part of the mass, it would, as a physical necessity of such rotation, assume the exact shape it now has—that is, somewhat like an orange, a little flattened at the poles, and bulging out at the equator. As philosophers are in the habit of referring effects to causes proved capable of producing them, all philosophers are now pretty well agreed on this elementary part of the subject to which I directed your attention in my last lecture.

I need not now refer again to the chemical and mineral nature of all the older rocks found in such conditions and places in the crust of the earth as would necessarily exhibit, if this theory of intense central heat were true, characters exclusively such as those produced by the liquefaction of the various minerals from heat, and not from solution in water; conditions in which all experimental observation agrees in showing that these igneous rocks do actually present.

Assuming then the theory correct of the original great heat and gradual cooling of the earth's crust, I proceeded to show you how it would necessarily contract in cooling and break up in various ways, and that in consequence of these ruptures various lines of mountains would be thrown up, the violence of the fractures displacing some portions of the crust upwards and others downwards, thus giving rise to the great physical features of the earth—the mountains of the land and the depths of the sea.

Having thus occupied your time on a former evening in considering the geological action of fire, I have now to invite your attention to the important geological actions of water.

To commence pretty much where I left off in the last lecture, you must consider that in the earliest time at which the earth assumed definite form and shape in space, it was still so hot that no water could exist on it, and that while you had a spherical form with a comparatively thin crust solid from cooling, there was another portion or envelope within that, in a liquid condition owing to the intense heat of the whole mass below the superficial crust; and then inside this liquid envelope you had the great central mass, increasing in its intense heat at a definite ascertained rate towards the centre, but nevertheless solid from the immense superincumbent pressure. When things were in this condition, you had granite forming the first crust, composed of quartz and mica, the two least fusible substances of the general melted mass, and therefore the first to solidify; and bearing in mind the necessity of the theory we have thus far elucidated, it would follow that the whole of the water we

now know of in the ocean and elsewhere must have existed at this early period in a great atmosphere surrounding the earth, and formed of thin diffused clouds. The same cooling process which solidified the crust of the earth would extend further, space being intensely cold (much below zero of Fahrenheit), and such cooling going on with great rapidity, a portion of this atmospheric envelope would at last become so condensed as to be precipitated, and then down it would come in a great shower of rain. As soon as this first shower came down, it would boil from contact with the still extremely heated surface, and ascend again in vapour, but having had the effect of causing a still more rapid cooling of the surfaces on which it first fell, and then down would continue to come the water in still greater and increasing deluges.

Now, you must bear in mind that the first form of the earth would be mathematically correct in the regular uniform shaping of the surface, affording no dips or hollows for the water to lie in, being what is in natural philosophy called a "spheroid of rotation;" and the consequence would be that, when these deluges came down, the water would at first evenly cover the whole surface, moistening it to a trifling depth. While the cooling process became by this means exceedingly accelerated on the surface, the inner fluid envelope we have before referred to would also in cooling shrink away from the superincumbent crust, which latter, being thus deprived of support, would at last break in with meridional lines of fracture running from pole to pole, and appearing sub-parallel to each other when viewed on the small scale. Thus as some portions of the crust fell in, forming great hollows in some places, while other portions being tilted up formed great hills in others, the waters till then uniformly distributed would rush into the deeps and hollows, and in the old words, "the waters would be gathered together, and the dry land would appear."

Thus far, then, the necessary preliminary for the simplest consideration of the geological action of water—by far the most important agent with which we are acquainted in altering the surface of the earth; which it does principally by degrading or wearing down the high lands, and distributing the worn portion in horizontal layers in the deep hollows of the ocean. These two actions may be, separately considered, viz.:—1st, as to the degration; 2nd, the transport of the *debris*, or material, worn away.

The first, or most simple, mode of the geological action of water, is that of clouds condensing on the mountain tops. You have first to consider the action of the sun heating the sea, and thus raising the water by evaporation from the surface of the sea; and this action of the sun in raising water from the surface of the earth is the simple foundation upon which must rest all we have to consider with regard to the geological action of water.

You will have then the sun raising the water by evaporation, and bringing the aqueous vapour to a greater height. But directly this vapour is made to rise much into space, the capacity for heat of the higher regions is so great that the vapour is cooled very quickly, and returned into the lower atmosphere in the shape of mist or watery rain; or if carried still higher into still colder regions, it is brought down again in the shape of hailstones. Now, take the case of this aqueous vapour impelled by air-currents, and passing along a low-lying region where the heat is sufficient to maintain in a vapoury condition a large quantity of water until it reaches a mountain side; the current forces it to turn upwards to get over this mountain top; and the air still appearing perfectly clear below, suddenly shows on the mountain top in the shape of cloud. The most common of appearances in every mountainous country, due to the greater capacity of the air in the higher region for heat, is this appearance of clouds resting on the mountain tops. For this reason it is that we have the simplest commencement of the geological action of water as a general rule on the tops of mountains, although it must not be forgotten that many mountain peaks pierce so high above the cloud-level, as it is termed, that they reach a region which is perfectly dry, owing to the intense cold permitting no vapour at all to mount there; but, taking the ordinary level of cloud condensation, you have the common condition known as Scotch mist, or more potent showers occurring almost perpetually on these elevated parts of the country.

These ridges or lines of mountains, sometimes called the backbone, and also the water shed of a country, take the water from the atmosphere condensed into the ordinary liquid condition, which then by the force of gravity descends the sides of the water-sheds, and commences its geological work, which is in the first instance to decompose the superficial rocks at the top of the mountain, and this it does in different ways, partly chemical, and in all cases by physical or mechanical means, but whether by one or both operations the result is the same; invariably a tendency to disintegrate—in homely term, to rot away—that is, to produce a falling to pieces of all rock masses on which the water acts. You find that the first action even on the summits of the mountains is to denude them of all surface soil; and the waters then finding some particular channel, become more potent for grinding down material than before, forming beds of streams in the upper portions, gradually increasing to rivers below. As they go they continually wear away their channels, and still as they progress they add to their wearing powers enormously by carrying with them sand, pebbles, and other small portions of the rock masses worn away above, until the torrents are often of prodigious power, striking even the least observant eye. But geologists care little for these local instances of grandeur, and generally fix their attention more on the quiet, universal, and in reality much more powerful continuous action of this kind in every part of the world; a

power having a definite relation to the velocity of the current, although an ordinary observer would scarcely be prepared to recognise the moving power of water in rivers at the ordinary rates; but striking examples are furnished at the mouths of some of the large rivers of the world, where the materials carried down form great triangular masses called deltas, from their form, resembling the Greek letter A—manifestly the result of the mud, sand, and shingle brought down to a level where the waters lose their transporting power from losing their velocity. These deltas have attracted the attention of all geological observers from early time, and I may refer here to some definite experiments made by Mr. Horner some thirty or forty years ago on the Rhine, at Bonn, on the exact transporting power of the river, which at that spot is some 1200 feet wide, 15 feet deep, and with a mean velocity of about 2½ miles an hour. His calculations gave as result the transport of 400 tons of material every hour, or about 8,000,000,000 of tons every year, nearly the whole of which is deposited in Holland, where the current loses its velocity, from the level nature of the country. This prepares you to consider the nature and extent of deltas formed at the mouths of greater rivers, such as the Ganges in India, the delta there being 200 miles long and 200 wide at the base, and covering 20,000 square miles of country, every atom of which has been carried down as mud in the water from the distant mountains in the interior.

I might multiply extraordinary examples of the definitely ascertained mechanical results produced by the greater rivers in various parts of the world, but general principles are all I have time to direct your attention to, so that I will pass on to fix your attention on the fact that the transporting power of a current of water increases enormously with its velocity; and this becomes a very interesting geological study.

When a geologist looks at any aqueous rock material which before solidifying must have merely presented the appearance of mud suspended in water, he knows that such fine material must have been deposited where no currents ran, probably at a depth in the ocean where no currents exist; and so, in looking at sandstone, or conglomerate containing sand, pebbles, &c., he knows that such a material must have been deposited where forcible currents existed, capable of moving such coarse portions; and carrying out this train of thought, the force of the current exhibits itself to the mind of the geologist in the size and density of particles in the deposits.

To take a few experimental examples of the actual transporting powers of different velocities, I may mention that common clay would be torn up easily by fresh water running at the rate of three inches per second, while it requires a velocity of six inches per second to carry fine sand such as that met with on the beach; eight inches per second will carry the coarser sand of the sandstone rocks, but it requires twelve inches per second to carry along even ordinarily fine gravel, twenty-four inches to carry round stones or pebbles two inches in diameter, and a swiftness of stream of thirty-six inches per second would be required for angular stones of the size of common road-metal.

The ordinary streams in hilly countries in flood-time frequently exceed this velocity, but when extraordinary floods occur masses of rock of enormously greater proportions, weighing even tons, are moved by currents of fresh water. To give a precise generalisation, the transporting power of moving water so augments with the quickness of the current, that in the language of the physicists it is said to increase "as the square of the velocity," a fact which will the more readily enable you to comprehend the great apparent increase of result in the case of deluges as compared to the comparatively small increase in the rate of velocity.

This remarkably potent action of fresh water in carrying along masses of stone arises from the fact of its great density as compared with air; and such being the case, it can be readily understood that sea-water, being from its saline constituents much denser than fresh, marine currents are consequently much the more powerful transports of rocky materials.

It becomes therefore necessary to apply a correction to the calculations I have mentioned as to transporting power, when considering materials deposited in sea-water; and in this way you find that very feeble currents indeed in the ocean are sufficient to account for the coarse texture of many sandstones and conglomerate rocks with which geologists have to deal.

The currents in the sea are of great importance to the geologist, not only (as in the case of what is known as the Gulf Stream, in the Atlantic) modifying the character of the climate, but even modifying the character of the animal and vegetable life to kinds which, were it not for such currents, could not exist in many definite localities. Thus, the immense current of the great Gulf Stream which I have just alluded to is the great transporter of the water and temperature of the tropics towards the north. Being nearly 1000 miles wide near St. Helena, and carrying on its vast surface a heated atmosphere of its own, it is reflected from the Gulf of Mexico so as to bring a portion of the temperature of the air and waters, as well as many of the floating seeds and fruits of the West India Islands, to the western coast of Ireland and Great Britain; and even as far north as to the Hebrides, four thousand miles off, portions of vessels wrecked in the West Indies have been carried by the current. The climatic effect of this on the British Isles is that, whereas by geographical position they should be surrounded with icebergs and icebound coasts; that the mountains should be covered with perpetual snow, and the valleys filled with glaciers; that only in the summer heats should the coasts be approachable; that scarcely any of the vegetables, and very few of the kinds of animals that now inhabit the isles, should be able to exist

there—as is the case in the Island of South Georgias, of similar geographical position in the southern hemisphere: instead of all this there is a mild climate—snow only in the winter, no glaciers and no icebergs, and an abundance of the plants and animals of warmer latitudes; and this wonderful fact is due to the raising of the whole temperature of the country by the warm waters of the Gulf Stream. But yet glaciers and other evidences of ice have left their traces in various parts of the British Isles, indicating probably a time when the temperature was much lower, or the climate colder, than at present.

Another mode of the action of sea-water is in undermining and breaking down rocky coasts. Every shore presenting a rocky front to the sea is crumbling away, the materials being carried off and deposited on beaches at the angle of rest, or that slope at which grains of loose sand will arrange themselves for quiet rest—an angle offering a powerful barrier to the sea. The sand and broken detritus taken from every rocky coast is carried out and laid at that same angle on some other low sandy shore or beach; and so every rocky coast is going back and is encroached on by the sea, and every humble sandy shore is advancing, and driving the sea back from before it.

This action of the sea, combined with that of the streams from the tops of the mountains, bringing down mud, sand, and other gravelly detritus, tends to counteract all that igneous agencies have effected in raising the mountain ranges of the earth; the rocky cliffs will be laid low, the mountain ranges worn down, and both be deposited on the low-lying shores; and the consequence will be that in no long time—speaking geologically, of course—we shall have no more land; it will all go into the depths of the ocean, have a uniform covering of sea to a uniform depth over it, and we shall arrive at pretty much the condition in which we began, and there will be an end to our geology.

Few things are more interesting than the power which a little knowledge of scientific matters gives us of seeing wonders in the commonest objects before us, and if what I have said be true on a grand scale, it is also true on a small scale, if we cultivate the faculty of observing nature truthfully, taking care not to be deceived by thinking we understand the things themselves because we have learned to make use of the terms applied to them. Always make it a point in attempting to investigate a subject, to know definitely what is meant by every word you use and hear, and do not be deceived by mere terms or theories; but go plainly to ascertain the laws of nature for yourself, apply your reasoning powers to them; and every one of you may add something important to the stores of human knowledge, if you will only find the occasion to examine common things more accurately than others have had time or opportunity to do before you, and record your observations in perfectly simple and truthful language.

Nothing can be more marvellous than to look at the surface of the earth, and bearing in mind all this wearing away of that surface which we have been describing, to realise the fact that the present appearance of this our earth cannot have been, or be, of very long duration.

Go to Westmoreland, Cumberland, or any other lake district, and the idea will rest in your mind that the streams from these lakes are wearing away their channels, and that when these channels become more and more worn all the water must inevitably be let out from the lakes, and there will be an end of the great geographical features of the district.

To impress this point on your mind on a grand scale, let me invite your attention to this diagram of the Niagara River and Falls.

From Lake Erie you have the river coming down to another great lake below, Lake Ontario. On leaving Lake Erie it is a broad shallow stream, varying in width from one to three miles, and running a sluggish course through a great flat table-land—Canada on the one side, New York on the other—on a bed of silurian limestone, known as the Niagara Limestone, common also in Cumberland, Westmoreland, and in some parts of this country as well.

This table-land of nearly dead level ends abruptly at Queenstown, dropping to a lower level; and it is absolutely certain, from examination of the sides of the ravine, that originally the falls were at the point I now indicate to you on the diagram, where, as you see, an escarpment takes place, and formed a cascade such as we now see at the present actual falls.

In this escarpment you see that the upper half of the cliff is composed of hard dark grey marble, having under it a layer of shale, a soft muddy material, very evidently not so fit to bear the wear and tear of the river as the upper layer. Now the fall of water over the edge of the limestone at the escarpment wears away the soft rock below, and in doing so undermines a portion of the overhanging limestone; down that comes, and the consequence is that the Falls of Niagara have in this manner worked their way backwards for miles to their present position, where the retrograde movement is still acting in the same way. During the comparatively short period of observation of those living in the country, calculations have been carefully made as to the rate of this retrograde movement, a foot a year being the lowest, although many believe that three feet a-year would be a truer average. At this rate it would have taken only 35,000 years for the falls to have travelled from Queenstown to their present position; but lengthened period as that appears, you can well imagine the water

still continuing to work back and back until the waters of Lake Erie are let out, and the whole face of the country changed by this incessant backward action and removal of the upper portions of the rock-bed to the lower levels, until these beautiful physical features of the landscapes, accidents of nature, destroy themselves by their own action.

Time is so short that I can scarcely touch on the more important matters I wished to draw your attention to, as showing the connection between the action of water and the grander geological features that geologists found much of their science upon; but I must draw your attention specially to the fact that, great as are the effects of ordinary currents at ordinary temperatures, both in the decomposition of land and in transporting it to lower levels, yet these effects are insignificant when compared with the increased powers developed by a reduction of temperature to a little below 32° of Fahrenheit, the freezing point of water. In all the cooler latitudes in which water freezes in the winter, you have this enormous and new power superadded. Water expands at the moment of freezing, a most curious and unusual property, which it possesses in common with but very few other bodies, the opposite being the rule. The heat of water may be reduced to forty degrees, and the water agrees with everything else by increasing in density as its temperature lowers to that point; but continuing to cool below forty degrees you suddenly find that it has a tendency to become lighter, and at 32°, or a little below, it suddenly expands, and increases by about 1-14th in bulk, and this it does with a power practically irresistable; so that you can well realise how wonderfully the degrading power of water is increased by the exercise in certain climates of this new natural property.

The ordinary slates covering our houses are not as a rule split by human means, for such an amount of labour would render them too costly. Take the instance of a slate-quarry in Wales. The masses of slate-rock are quarried, and left exposed with the edges upwards to the summer rains; the water is soaked up by them; and then, when the frost of winter comes, the water which has percolated through and amongst the *laminæ* of the slaty mass freezes, expands, and the whole mass opens out into so many leaves, like a book or fan; these *laminæ* being afterwards shaped into their due pro- portions for roofing and other purposes. What water does in this practically useful case it does invariably and everywhere in the cooler latitudes; so that in every valley the rains fall and drain into the crevices of the stony banks, and with the arrival of winter the rocks are torn asunder, and great sharp-edged and angular masses hurled around, as all who have travelled in such countries may have observed repeatedly. It is this expansion of the freezing water, wedging out great masses of rock from the mountain sides, which forms the main power in nature by which such masses are subjected the more easily to the comparatively weak action of the river currents that I referred to previously. The action of ice is enormous, not only for degrading but also for transporting; and this increase of power is also due to the expansion and consequent lightness of ice. The diminution of density is so great, that not only can enormous masses of frozen water float on the surface, but these can also support immense blocks of rock, and carry them thousands of miles over the ocean, moved by its currents from both polar regions to the warmer seas nearer the equator. You find in both hemispheres, towards the poles, these immense ice-islands, as depicted on the diagram now before you, coming regularly in spring and summer to the warmer seas, as far as the Azores in one hemisphere and the Cape of Good Hope in the other, and laden with these enormous rock-masses, of many tons in weight, having the peculiar character which the geologist recognises in them when found in all gravel and detritus of the "northern drift" deposits, as they are called, the peculiar character by which he at once recognises all these ice-borne rocks—viz., the edges and corners remaining sharp and unworn. As the icebergs melt in the warmer seas they frequently topple over, and then these immense blocks of stone are dropped to the bottom of the sea in this our present day, just as they were in the older geological times of the drift formations. The diagram before you illustrates some examples of these "erratic blocks" as they are termed, in the midst of large beds of fine sand and mud, deposited in all their angular character in those deep-sea beds in which no current could have travelled to roll them along; and also in rounded shingle-beds of boulders, or rounded water-worn stones, transported along the bottom by currents giving them a rounded, worn character, unlike that of the erratic blocks dropped amongst them.

A very curious circumstance connected with these "erratic blocks" is the fact that in Alpine countries you find them more commonly on the tops of the mountains than in the valleys or low plains. Let me instance to you the familiar example of what is known as the Three-rock Mountain, near Dublin, and which I draw roughly on the board before us. As you look from the city you distinctly see on the rounded top of the granite mountain, seven or eight miles off, three immense sharp-angled stones, which, on close inspection, prove to be of different material from the mountain itself on which they rest, and obviously come from some great distance. It becomes evident that at one time the surface of the sea must have been as high as the top of the mountain, or rather that the mountain must have been sunk below the level of the sea, so that the icebergs floating with these stones upon them there became stranded; and so with other submarine mountains on the shallows, over the upper points of which such stones have been deposited; and then when a whole country or continent was raised, there would remain the blocks on the tops of the mountains, and not in the valleys or plains, these latter in the

submarine period being of course the deepest hollows of the ocean, which the icebergs would pass over unarrested.

The examination of the drift deposits in England and Scotland shows the geologist that at the latest of the geological periods immediately preceding human time, or even in human time itself, icebergs passed over those two countries in great number.

You doubtless know the configuration of the mountainous North of England tract of country joining England and Scotland, with its great mountains of limestone, and having towards the centre a low break, or north and south valley or depressed plain, with evidence of a great current having come from the north in the drift period, and rushed through this gap into the middle of England, and undoubtedly bringing great quantities of icebergs with it; for the northern sides of these limestone hills are so thickly covered over with unworn granite blocks that Dr. Buckland supposed they were *in situ*, and actually mapped out these hills as mountains of granite in his older plans; but subsequent research has shown them to be really mountains of limestone merely covered over with these granite and syenite masses, stranded on their higher parts; and what is more extraordinary still, every one of these masses shows traces in its mineral character of having come from mountains in Scotland, Sweden, or Norway, from which they were broken and to which they may be traced; while as you travel southward into England you find on the tops of the mountains the familiar North of England rocks; and so they all carry out the same story of ice-transporting action covering the land nearly to London itself with these obvious indications of its work.

In the same way you find geological evidence of the existence of ice and its mechanical action on this grand scale in many localities in Europe and America where such action no longer takes place, furnishing very conclusive evidence in its way of the existence during the formation of the drift deposits of what is known to geologists as "the glacial period," presenting the singular apparent anomaly of the particular localities in which these glacial formations make their appearance having been formerly visited with a very much colder climate than they now enjoy, in contradistinction to the general rule of evidence in all parts of the world in all geological times of the gradual cooling of the earth and climate as time progressed

An extraordinary evidence of the mechanical action of ice, besides that of transportation, is found in these regions. For example, nearly over the whole of Great Britain under the drift you find that the rocks coming to the surface appear as if planed by some vast planing machine, and not only so, but grooved, scratched, and scored in a nearly uniform north and south direction, and running for miles and miles in the same way as you would find at present produced on the beds of rivers or shallow seas by ice in which rocky masses had become entangled, marked with parallel lines not producible by any other means, and affording the most extraordinary evidence to the young geologist of the passing of ice with all these mineral masses entangled in it over the face of every familiar country of Europe, and the milder latitudes of North America.

From the failure of our time, I regret to find that I must leave untouched the subject of glaciers themselves, and the discussion of the "Glacial Period" of geologists.

The Education of Engineers.

A Lecture, DELIVERED BY W. C. Kernot,
On 28th September, 1871.

THE subject I propose to consider to-night is a very important and difficult one, and I fear that within the short limit of an hour's lecture it will be impossible to render it justice. However, I shall endeavour to go into the matter as simply as possible, pointing out some of the more prominent evils in our present system of educating engineers, and suggesting means for their removal.

With regard to the importance of the profession of the engineer, I think no doubt can be entertained by any thinking person. The works of the engineer are found everywhere around us; wherever we go, and whatever we do, our comfort and safety depend upon him. Before our public lands can be rendered available for sale or settlement, the topographical engineer is needed to execute surveys extending over vast tracts of country, to mark out allotments, choose sites for townships, indicate lines of roads, and delineate the various features of the country. Then the road engineer is called in to open up practicable lines of communication, to bridge rivers, cross fathomless swamps, and supply a means whereby the produce of the land may reach the market, and the commodities of other countries find their way to the home of the settler. Until this be done, the most fertile district will remain practically useless to the community in general.

As population increases, and the resources of a locality become more fully developed, modes of locomotion and transport speedier than horse traction are demanded, and we find the engineer again at work, constructing railways.

His work does not end here. We soon require supplies of water, and the engineer is called upon to construct

reservoirs, to lay down miles of pipes, to reticulate our towns, and bring the waters of mountain streamlets to our very doors.

Sewerage naturally follows water supply, and the engineer is required to construct drains and sewers, whereby our towns may be kept clean and dry, and all matters offensive to the senses or injurious to the public health removed at once to a distance from the dwellings of men.

Then our shipping needs harbours and docks for its reception, and these must be supplied, with various appliances for the purpose of loading and unloading vessels, and storing merchandise. Our rivers, too, will require improvement, and our towns and cultivated lands must be protected from floods. This involves the deepening of channels, the construction of embankments, and the execution of other works too numerous to mention.

Inland navigation gives further scope for the practice of engineering, and by the removal of obstructions, the construction of weirs and locks, the engineer causes streams which previously had conferred no appreciable benefits upon the districts through which they ran, to become most efficient highways for the conveyance of merchandise.

In localities where no suitable rivers exist, canals have to be made, and the construction of these necessitates the employment of no small amount of engineering skill.

The artificial lighting of our towns, the construction and management of gasworks, lies also within the domain of the engineer; and manufactures of all kinds—together with the operations involved in mining for gold, coal, iron, copper, and other minerals—continually require him to design and construct the various engines and machines necessary for their successful prosecution.

In fact, there is hardly any object, any commodity, anything we use, which does not in some way render us dependent upon the engineer; and this being so, it is clear that the importance of the profession is great indeed

Looked at from a monetary point of view, the engineering profession cannot fail to excite great interest when it is remembered that something like £20 per head for every man, woman, and child in this colony has already been invested in engineering works.

Suppose now, for one moment, that our engineers, through want of proper education, be not competent for the work they are called upon to perform, what will be the result i Our roads impassable, our railways a failure, our reservoirs bursting, our rivers overflowing their banks and destroying life and property, our manufactures languishing, the advancement of the country retarded, possibly even its solvency endangered.

Before discussing different systems of engineering education, it will perhaps be well to give an example indicating the nature of the engineer's work, and illustrating the various demands constantly made upon his judgment and skill.

Let us take a work of frequent occurrence, say a large bridge across some important river that has hitherto formed a bar to the traffic passing between two districts.

The first operation will be the collection of statistics. A careful investigation must be made as to the probable traffic across the projected bridge. Valuable data may be obtained from the Registrar-General's office, from local records, or from actual observation. The result of this calculation, viewed in connection with the estimated cost of the structure, will enable the engineer to judge whether the proposed work is likely, in a commercial sense, to pay.

The next step will be to determine the most suitable site for the bridge. The river must be examined, its floods observed, its banks surveyed, borings must be made in search of a good foundation; and quarries of good stone, of lime, and other material needed in the execution of the work, must be diligently sought.

The engineer will probably discover several promising sites, each one possessing some particular advantage over the others, and the ensuing process of weighing one recommendation against another, and arriving at a correct decision between various conflicting considerations, must necessarily be such as to tax to the utmost the greatest skill and the most carefully trained judgment.

The site fixed, the next step will be to design the structure, and first of all a choice must be made as to material. Stone, brick, iron, and timber each present certain advantages, and their relative cost and durability must be carefully considered before making a final selection.

Suppose the decision to be in favour of stone supports or "abutments," and an iron superstructure. In designing the abutments, an accurate knowledge of the supporting power of the substratum, and also of the horizontal pressure or thrust of the earthen embankment leading up to the bridge, will be needed. Should any error occur at this stage, the result will be either that a large quantity of valuable material will be wasted, or, on the other hand, the very existence of the structure may be imperilled by the lack of strength of its most vital parts.

The superstructure may consist either of a horizontal girder, so arranged as to impose a vertical pressure only on the abutments, or of an arch. In either case, the designer will first need to determine the greatest probable load the bridge will be required to sustain; then, by a somewhat complex mathematical investigation,

he will discover the magnitude and direction of the various resulting stresses or forces acting upon all the different parts of the structure; and, finally, he must so arrange all the details as to obtain a sufficiency of strength with a minimum of material and workmanship. This work will demand for its successful completion—first, a thorough knowledge of the laws of force, as investigated by mathematicians; and, second, an equally thorough knowledge of the physical properties of the material, the process of its manufacture, the various forms in which it reaches the market, and the most convenient and efficient method of uniting together the integral portions of the structure.

The flooring or deck of the bridge, the handrail and other matters of minor importance, must lastly be arranged; and a judicious treatment of these details, though perhaps adding nothing to the stability of the structure, will greatly conduce to the comfort and convenience of travellers.

A carefully written description, called a specification, should accompany the plan. This is by no means an easy part of the work, as every omission or mistake is sure to turn up during the execution of the work, and become a fruitful source of annoyance and expense.

The operation of "taking out quantities" will next engage the attention of the engineer. By an intricate application of the science of mensuration, he will determine the number of cube yards of masonry, tons or pounds of ironwork, cube feet of timber, etc., &c.; and then his knowledge of the commercial value of various descriptions of material will enable him to estimate the total cost of the structure.

Tenders are now called for, and the contract for the execution of the work is let. The superintendence of the work immediately demands attention. Should the contractor prove an honourable man, anxious to fulfil his obligations thoroughly, all will go on smoothly; but if, on the other hand, he should be desirous only of his own emolument, and careless as to the quality of the work done, the position of the engineer will become most difficult. None but those who have actually been connected with the execution of important works can form an adequate idea of the numerous ingenious artifices employed by dishonest contractors in order to substitute inferior material and workmanship for that specified, and of the incessant vigilance requisite in order to detect and frustrate such attempts.

The work proceeds, and in due time is completed; but in almost every case small alterations are needed, errors in the specification are discovered and have to be rectified, and extras require to be authorised and paid for in a manner equitable both to the client and the contractor.

From this example—which is, I think, a fair one—it will be evident that the profession of civil engineer is most onerous, and makes very exacting demands upon the forethought, skill, judgment, and care of those who follow it.

The mechanical engineer usually finds an outlet for his skill in acting as contractor to the civil engineer for metal work, and as manufacturer of machinery. In this latter branch he has the great advantage of carrying out his own designs, and consequently knows nothing of the difficulty and anxiety of superintending contract work. Great demands, however, are made upon his ability and care in other directions. He needs extensive experience in the manipulation of metals, and must practise a most thorough system of keeping accounts, so that every portion of material used, and every hour of the workman's time, may be debited to the proper piece of work.

Although usually engaged in copying, with but slight modifications, well-known designs, he is not unfrequently called upon to devise novel contrivances demanding considerable inventive skill. Beside, a natural and laudable ambition will incite him to leave the beaten track, and improve upon the works of his predecessors; hence he will need considerable scientific knowledge to guide him in his investigations, to prevent him from wasting his time upon ideas which, being contrary to the established laws of nature, must necessarily fail, and to save him from the too common error of mistaking mere modifications for essential improvements.

The amount of skill and training exhibited by our engineers varies very much indeed. They may be divided into several great classes, not sharply defined, but passing by insensible gradation one into the other.

First—We have men of thorough education, both in science and actual work, understanding principle as well as detail, excellent in theory, unimpeachable in practice. These naturally take the highest place, and are without exception men of refinement and culture, upon whom for me to comment would be simply impertinence.

Second—A large class consisting of men possessing much practical skill, but unfortunately deficient in theoretical knowledge. So long as these follow in the footsteps and copy the works of their more scientific brethren, they do not fail to give satisfaction. But when they attempt to strike out in a new direction, and produce something original, they are in constant danger of falling into most serious errors through not properly comprehending scientific principles.

For many kinds of work such men are eminently adapted. For example, in road construction there is no need of accurate theoretic knowledge, but wide scope for the exercise of sound judgment, supplemented by that acquaintance with the properties of materials which long experience alone can give. In the supervision of works

designed by abler men this class of engineers prove themselves very useful. Their great practical experience in the execution of work renders them most reliable and trustworthy; while so long as they can understand an ordinary drawing and specification, and discriminate between good and bad work, their ignorance of the scientific principle upon which the efficiency of the structure or machine represented by the drawing depends is a matter of no consequence.

Third—We occasionally find gentlemen possessed merely of theoretic knowledge entering the engineering profession, and endeavouring to compete with other engineers. Their knowledge of principles is most thorough, but they lack practical acquaintance with matters of detail; and lacking this, they fail. Most likely they could give an excellent description of the great Britannia bridge, but would hopelessly break down if engaged in the very ordinary task (to a practical man) of constructing a common log culvert.

The professional career of such is generally but short They retire discontented with themselves and with others; and the further evil is that they bring scientific knowledge into disrepute with less educated men, who look upon them, and by implication upon all science, as a mere sham; and so the great breach between theory and practice, instead of being bridged over, is widened.

Last of all, there is a class of men of whom, perhaps, the less said the better. They glory in the title of "practical," they hate theory, they despise science, knowledge of any sort they think beneath their notice, they consider they know everything and that wisdom will die with them; and no matter how great another engineer's attainments may be, if he happen to differ from them in the slightest particular, they put him down as a mere theorist, and declare him to know nothing at all about the matter.

These men are the bane of engineering work, and anyone having such a man in the capacity of workman or contractor under him will know it to his cost. Nothing is right. The practical man knows everything, and the engineer knows nothing; the practical man buttonholes you to make you admit you are but a charlatan, an impostor, and will put forward the most preposterous ideas, utterly contrary to the firmly-established principles of science, forcing them down your throat as the result of his long experience, ten thousand times more valuable than any mere theory. I have known, have seen, these practical men, as no doubt many of my hearers have, the most ignorant but at same time conceited beings that can be imagined, and constantly making the most atrocious failures; but however gross their blunders, they never seem to see them, but continue to puff their own ability and waste the capital of their misguided clients.

The opinion that there is a necessary and inevitable discord between engineering theory and practice seems to have taken deep root in the minds of many men. "Very good in theory, but will not do in practice," is a phrase in constant use, and no one can come in contact with the majority of engineers without perceiving that they regard theory as utterly useless, and experience as the only reliable guide. We do not find astronomers behaving in this way—they do not inveigh against the law of gravitation, or hold up the parallelogram of forces to ridicule; on the contrary, they uniformly testify that the closest agreement exists between their theoretic calculations and actual observations; and if this be the case in astronomy, why not in engineering? The truth is, that in engineering, as well as astronomy, experience and theory are at one; and if there be any apparent contradiction, it is either because some error has been committed in the theoretical investigation, some essential term or factor omitted, or else the conclusions which we dignify with the name of experience are hasty and erroneous generalisations, liable to be greatly modified, if not completely reversed, by a more thorough examination of the facts of the case.

Perhaps you may remember an anecdote related by Mr. Ellery, in one of his lectures, of a captain of a vessel who experienced great difficulty in navigating his ship, owing to the chronometer having broken down. When asked why he did not verify his position by lunar observations, he replied that he tried two, one of which placed him in the centre of Sahara, and the second in some other equally impossible place, and that, therefore, he concluded that lunar observations were not of much account.

So with many engineers. They attempt to apply scientific principles which they have never thoroughly mastered, they omit some vital factor, and consequently their conclusions are vitiated; and then, like the captain with his lunar observations, they conclude that theory is an utterly unreliable guide. Very many instances of this particular error have come under my own observation.

The following example will serve to exhibit some of the evils flowing from the imperfect acquaintance with scientific principles commonly found amongst professional men. The security of life and property in a certain district depended upon the efficiency of a particular water channel. Four engineers were consulted as to its discharging power; two affirmed that it was ample, the other two were equally sure that it needed to be six or eight times as large. Each opinion was given after a most careful examination of the facts of the case, and the problem was one admitting, or rather requiring, a purely mathematical investigation. You will, I think, admit that there must have been great ignorance on one side or the other, especially when it is remembered that this subject has long ago been thoroughly discussed by scientific men.

Again, look at the number of absurd inventions, in prosecuting which men of great practical skill, excellent

knowledge of detail, and capability of judging material and workmanship, have, for want of acquaintance with scientific principles, spent many years, or even their whole lives, in following visionary ideas which the slightest scientific examination would have exploded. Instances of the most egregious waste of time, skill, and money, for want of a very little accurate theory, are only too common in this colony as well as in the mother country.

Before leaving this part of my subject, allow me to read an extract from one of Professor Rankine's works, and to assure you that his view of the case is by no means exaggerated, and that examples of the evils to which he refers are to be found almost everywhere.

Rankine says—"It is on the practice of mechanics and engineering that the influence of the great fallacy is most conspicuous and most fatal. There is, assuredly, in Britain no deficiency of men distinguished by skill in judging of the quality of materials and work, and directing the operations of workmen—by that sort of skill, in fact, which is purely practical, and acquired by observation and experience in business. But of that scientifically-practical skill which produces the greatest effect with the least possible expenditure of material and work, the instances are comparatively rare. In too many cases we see the strength and stability, which ought to be given by the skilful arrangement of the parts of a structure, supplied by means of a clumsy massiveness, and of lavish expenditure of material, labour, and money; and the evil is increased by a perversion of the public taste, which causes works to be admired, not in proportion to their fitness for their purposes, or to the skill evinced in attaining that fitness, but in proportion to their size and cost.

"With respect to those works which from unscientific design give way during or immediately after their erection I shall say little, for with all their evils they add to our experimental knowledge, and convey a lesson, though a costly one. But a class of structures fraught with much greater evils exists in great abundance throughout the country, namely, those in which the faults of an unscientific design have been so far counteracted by massive strength, good materials, and careful workmanship, that a temporary stability has been produced, but which contain within themselves sources of weakness obvious to a scientific examination only, that must inevitably cause their destruction within a limited number of years.

"Another evil, and one of the worst, which arises from the separation of theoretical and practical knowledge, is the fact that a large number of persons possessed of an inventive turn of mind, and considerable talent in the manual operations of practical mechanics, are destitute of that knowledge of scientific principles which is requisite to prevent their being misled by their own ingenuity. Such men too often spend their money, waste their lives, and, it may be, lose their reason, in the vain pursuit of visionary inventions, of which a moderate amount of theoretical knowledge would be sufficient to demonstrate the fallacy; and for want of such knowledge many a man, who might have been a useful and happy member of society, becomes a being than whom it would be hard to find anything more miserable.

"The number of those unhappy persons, to judge from the patent lists and from some of the mechanical journals, must be much greater than is generally believed. The most absurd of all their delusions, that commonly called the perpetual motion—or, to speak more accurately, the inexhaustible source of power—is in various forms the subject of several patents in each year.

"The ill success of the projects of misdirected ingenuity has very naturally the effect of driving those men of practical skill who (though without scientific knowledge) possess prudence and common-sense to the opposite extreme of caution, and of inducing them to avoid all experiments, and confine themselves to the careful copying of existing successful structures and machines—a course which, although it avoids risk, would, if generally followed, stop the progress of all improvement."

The engineering profession is usually entered in one of two ways. Either the youth is articled for a term of years to an engineer in practice, or else he is placed at an engineering college where he attends lectures upon various scientific and professional subjects. At the close of his apprenticeship, or curriculum, he is supposed to be qualified to undertake work on his own responsibility. Each of these methods is, in my opinion, exceedingly defective, and I maintain that a judicious combination of the two is necessary in order to produce thoroughly competent engineers.

When a young man is articled to an engineer in practice, he is first employed in tracing or copying drawings, and other merely mechanical or routine work. After a time, if he show intelligence and aptitude, he is required to make working drawings of various structures and pieces of mechanism, these drawings being, in most instances, little more than fair copies of rough sketches supplied by the engineer. He is also afforded opportunities of inspecting works in progress. This constitutes the whole of his education. He cannot help learning *how* work is done, but he never learns *why* it is so done. The engineer invariably considers that the pupil receives full value for his premium in having the run of the office and access to the various drawings and specifications to be found there, and never for one moment dreams that it is any part of his duty to supply direct instruction in the principles of engineering science. The pupil, on the other hand, is well content with a system which imposes hardly any strain upon his intellect, and is only too apt to fall into the almost universal delusion

that experience is everything, and theory of no consequence at all.

At this stage, I cannot but animadvert upon a practice which obtains with certain men professing to be engineers, but having no practice. Such persons open offices, insert magniloquent advertisements in the daily papers (a most unprofessional proceeding), and then endeavour to induce young men to pay high premiums for the privilege of becoming articled pupils. The unfortunate youths at first imagine in their ignorance that all is well, but before their apprenticeship is over they discover that they have been the victims of a most iniquitous deception, and that as far as engineering education is concerned they are no better off than when they commenced.

Gentlemen educated solely by being articled to an engineer almost invariably become members of that class of engineers who possess abundant practical knowledge, but make most egregious blunders in matters of a theoretic or scientific nature; excellent as they are in the execution of work, their designs are either mere copies and adaptations of existing structures, or, if they attempt anything novel and original, are characterised by a supreme disregard of the most firmly established scientific principles.

The second method of entering the profession is by passing through a course of systematic study at an engineering college. Those who adopt this route receive incalculable benefit from the mental discipline necessarily involved. They obtain a thorough insight into those fundamental principles which form the basis of all sound practice, they form orderly and logical habits of thought, but, unfortunately, they are very apt to despise small matters of detail and routine.

In my position of Lecturer on Engineering at the University of Melbourne, I have had many opportunities of observing this defect; many of the ablest among the students seem quite content with mastering the leading principles, and exhibit a marked indifference and disregard of detail. They thus are in great danger of becoming totally unfitted for attending to the minutiæ of everyday practice, and expose themselves to the ridicule of those who, with far less knowledge of principles, possess this indispensable acquaintance with detail. Great disappointment is not unfrequently felt by gentlemen who find, at the close of a curriculum extending over two or three years, that they still stand in need of many things in order to fit them for the practice of their profession. But it should be remembered that an apprenticeship extending over five or seven years is needed by many handicraft trades; and if an artisan's education requires so long a period, surely it is absurd to expect to obtain a complete grasp of a difficult profession in two, or even three, years. The University course cannot possibly do more than lay the foundation, upon which a super-structure of sound practical experience must afterward be raised, by means of long continued observation and study; and those who look upon their university studies in this light, and are careful to give both theoretic principles and practical details due attention, will not fail to confess that such a course is a most indispensable preliminary to the intelligent and progressive practice of engineering.

The judicious combination of practical and scientific training for a young engineer presents a problem of great difficulty; but, with all due deference to the opinions of the many able men who have thought and written upon this vexed question, I would venture to suggest the following course as affording, upon the whole, a tolerably satisfactory solution :—First, then, let the lad have a sound school education, suitable to the position in society he is expected to fill, and having, at the same time, a bias or leaning toward the pursuit which he is to follow. For example, his attention should be given to mathematical and scientific, rather than to classical or historical, studies. At the age of fifteen or sixteen he ought to be sufficiently advanced to pass such an examination as that for matriculation at the University of Melbourne. He should then devote at least one year to studies of a mathematical nature. Ample time must be given to algebra, Euclid, and plane trigonometry, and the greatest care should be taken in order to insure that the student may not only commit the principles of these various sciences to memory, but also thoroughly comprehend the trains of reasoning leading up to these various principles, and be able to apply them to the practical solution of problems. Great attention should be given to the working out of problems and exercises, and these ought to be carefully chosen, and should, in all cases, have a direct bearing upon the practice of engineering. This is a point of much importance. Very frequently the time of the student in mathematics is spent in the solution of problems, elegant no doubt in themselves, but of no practical value or interest whatsoever; while other problems, very nearly if not quite as well suited for the elucidation of the subject in hand, and of the greatest practical importance to the engineer, are totally neglected.

During this first year of study there should be no difficulty in mastering thoroughly algebra up to, but not including, the binomial theorem; plane trigonometry, as far as the solution of all the ordinary cases of right and oblique angled triangles; and the first six books of Euclid, together with exercises upon the various propositions. An agreeable relaxation from these somewhat severe studies may be found in spending a day, say, once a week in the practice of surveying.

The student might also spend a portion of his time in plotting the surveys, but I think it would be well for the present to make surveying and plotting secondary to algebra, Euclid, and trigonometry.

The first year's course satisfactorily completed, the student might be introduced into the office of an

engineer in practice; here he should spend a portion, say about half, of his time in acquiring a practical knowledge of office routine, the other portion to be devoted to lectures upon the equilibrium and motion of rigid bodies and fluids. These subjects are of the utmost importance, and I do not hesitate to say that fully three-fourths of the errors and difficulties in which our practically educated engineers are so frequently involved are due to ignorance of these branches of inquiry. Here, as before, the student's ingenuity should be tested by an ample supply of problems and exercises, chosen as far as possible from actual engineering practice.

I am perfectly aware that the suggested division of the pupil's time between the office and the college would be looked upon with great disfavour by many engineers; but I am equally certain that, without some such arrangement, it would be extremely difficult for the student to obtain an adequate knowledge both of the theory and practice of engineering.

During the third year the greater part—say, three-fourths—of the student's time might be devoted to office work. He should now be competent to make original designs and working drawings for various minor engineering works, and also to perform the different operations of engineering field work, and in this way render himself of much value to his employer. The remainder of his time should be devoted to courses of lectures upon the strength of materials, the application of the principles of statics and kinetics to engineering structures and machines, and the principles to be observed in the designing of works. During the second and third years, lectures on chemistry and geology should be attended, as it is extremely desirable that every engineer should have a good general acquaintance with the principal facts of these sciences.

The study of higher algebra, of analytical geometry, and of differential and integral calculus, I do not regard as essential. Should the student, however, exhibit a taste for such subjects, let him by all means be encouraged to pursue them.

A thorough examination, extending over several days, and embracing all the subjects of the three years' course, would form an appropriate termination to the curriculum of lectures.

The engineer's education is not yet completed. It will be well for him now to spend from six to twelve months in the actual supervision of works in progress. He will thus gain much valuable practical experience, obtainable in no other way. He will be trained in judging of the quality of materials and workmanship, and will become acquainted with the management of contract work. At the close of a fourth year spent in this way a diploma or certificate of competency might be granted.

In order that the student may gain the greatest possible acquaintance with practice, it will not be sufficient for him merely to perform carefully such work as is specially committed to his charge. He ought also to take every opportunity of making himself acquainted with all designs, plans, schemes, and ideas in the office to which he is attached, and should master them completely, so as not only to know *how* any particular piece of work is to be executed, but also to comprehend the special reason or object of each detail. He should improve every opportunity of examining the practice of other engineers, and comparing it with that of his own chief; and by a careful attention to the literature of his profession, and especially such publications as *The Transactions of the Institute of Civil Engineers*, *The Engineer*, &c., should keep himself thoroughly conversant with all important professional questions of the day. With respect to this part of an engineer's education, Mr. Conybeare, who is a very high authority, speaks as follows:—"A thoroughly trained civil engineer's knowledge of practice, that is of examples of the application of scientific principles and formula; to all cases of civil engineering, is not confined to the comparatively limited series of works which have come under his own personal obser- various; for during his pupilage he is generally allowed access, under restrictions, to the far more extended series of engineering cases presented by the records of the office in which he is placed, comprising the working drawings and specifications of all works executed by his chief during his extended professional career, including those which had been used for the construction of some hundreds of miles of actually executed railway. And he should extend this series of examples by a careful study of the literature of his profession, by analysing carefully, note-book in hand, all the published drawings and descriptions of approved examples of engineering that he can obtain access to, entering in his notebook, in each case, the more essential particulars of the example, such as its dimensions, material, principle of construction; also, whether the end in view in each particular case appeared to have been accomplished more or less economically and efficiently than in other cases, where, with a similar diagnosis, a different treatment had been adopted; noting, as far as possible, which were the particular points in each example most worthy imitation, and which, on the other hand, were better treated in some other example. By this process he will bring himself to a nearer knowledge of the one best way of attaining the particular end in view; for in every possible problem in construction there must be some one specific way of solving it that is better than any other; and by thus possessing himself of all that his predecessors had obtained, he will at least get as near the best way as they did, if he cannot, on the stepping-stones of their experience, rise to higher things in his own practice.

"The practical study of the published accounts of engineering works should not be restricted to English examples, for there is much that is worthy of imitation in the practice both of French and of American

engineers. The former have always been superior to ourselves as theorists; and the extension of railways and other engineering works in France has of late years given them a more extended field for the application of science to actual practice, which their superior mathematical education has enabled them to turn to the best account. Their more recent works are consequently deserving of the closest study, and their published memoirs are generally models of methodic and scientific description.

"And American engineering is very highly suggestive. Necessity is the mother of invention, and the peculiar circumstances of America necessitated the execution of ways of internal communication of immense length, the frequent bridging of mighty rivers, the formation of quays, jetties, and graving docks, for loading, unloading, and docking the largest vessels—in fact, of all the appliances that modern commerce requires—at a mere fraction of the cost which in Europe is considered indispensable for works intended to fulfil the same purposes, and which scarcely fulfil them any better."

Taking Mr. Conybeare's view of the case, it is plain that the greatest possible advantage is to be gained by travelling to foreign parts, and examining the peculiarities of engineering practice in different lands, and under various circumstances. This, however, will, on account of the great expense involved, be an unattainable luxury to many. Fortunately, photography offers a not altogether inadequate substitute, by supplying the student with faithful representations of important works in all parts of the world, and I would strongly recommend young engineers to purchase and study such photographs as they may meet with. By this means their ideas will be enlarged, and their practice rendered more intelligent.

To sum up, then—theory and practice are the two pillars upon which all sound engineering work must be based. A man understanding theory, but deficient in practice, may have good general ideas, but will utterly fail in putting them into execution. A man of experience, but destitute of theory, will be able to carry out ordinary work in a satisfactory manner, but, should he leave the beaten track and attempt anything original, will assuredly fall into the grossest blunders for lack of scientific training. Those who have been well instructed in both branches will become intelligent and scientific engineers, while all others will, to the extent to which they are defective, be professionally crippled.

NOTE.

A plausible but most erroneous remark is frequently made by those who desire to disparage scientific studies, to the effect that the steam engine was originally invented, and that all great improvements in its construction have been made by purely practical men, and not by men of science.

The truth is, that the most approved steam engines of the present day differ but very little from those invented and constructed by James Watt; the principle is the same, and many of the details are the same; the main difference lies in a better proportioning of parts and a much higher finish. It is strange how small a field for improvement Watt left unexplored. And James Watt was not an engineer at all. He was by trade a mathematical-instrument maker, and was employed to repair and adjust certain philosophical apparatus belonging to the University of Glasgow. There he became intimate with several eminent men of science, under whose guidance he not only thoroughly mastered all the scientific principles bearing upon heat, evaporation, &c., that had then been demonstrated, but even launched out into a series of original investigations that would have preserved his memory had he never invented the steam engine.

Watt was a thorough man of science, and he treated the steam engine in such a thoroughly exhaustive and scientific manner that the combined ingenuity of three generations of engineers has failed to effect any radical improvement.

Fermentation.

A Lecture, DELIVERED BY William Johnson,
President of the Pharmaceutical Society of Victoria,
On 5th October, 1871.

IT has been observed from time immemorial that certain bodies of a compound character—such as the juice of the grape, also grain flour—were, under certain circumstances, susceptible of a peculiar chemical change in their constitution, by which their general character became more or less altered. Nothing beyond the mere fact was, however, known to the ancients, or indeed moderns until a comparatively very recent date; no explanation offered, no cause assigned for the phenomena.

We read in "sacred writ" that our common ancestor, Noah, planted a vineyard, and, drinking of the wine, was made drunk. Evidently therefore the art of wine-making was known in the time of Noah, and as he is said to have planted a vineyard, he must have derived his knowledge and experience from a period still more

remote: therefore the process must have been well known to the ancestors of Noah, even, perhaps, almost up to Adam. Fermentation, therefore, appears to have been one of the first chemical processes known to man. That its useful application to bread-making was known at a very remote period is also certain, for we are informed in Genesis that the Israelites practised the process when they were in bondage in Egypt, for it was during that time the feast of unleavened bread was ordained.

In wine-making all that is requisite is to place the juice of the grape into suitable vessels for a sufficient length of time and in a proper place, when fermentation sets in spontaneously, and continues to the end of the process. In bread-making and brewing it is necessary to add yeast, a substance composed of gluten, one of the constituents of grain in a certain state of decay or putrefaction, and abounding in a species of fungous growth of a very low type. By many this fungus is believed to be the direct cause of the fermentation; by others, however, this view of the case is much questioned, the cause being rather assigned to contact with a decomposing body. Possibly the truth may lie between these hypotheses; and, whilst allowing with Liebig and his followers that fermentation is excited by contact with a decaying nitrogenous body such as yeast, yet the cause of that decay itself may be, and most probably is due to the attacks of fungi upon it. Without fungi, then, there would be no decomposing gluten, and without decomposing gluten no fermentation.

You are, probably, most of you acquainted with the processes of bread-making and brewing. The latter has been recently ably elucidated in this Lecture Hall, by my friend Mr. Foord, and will therefore be only slightly alluded to by me, and even the process of bread-making need not detain us long. Most of you are doubtless aware that the baker takes Hour, which he mixes up with more or less water, adding a certain proportion of brewers' yeast and salt; and when fermentation has fairly commenced, known by the rising and swelling of the mixture, the whole is well kneaded together; and after a while, when sufficiently risen and strong, the mass is cut up into suitable-sized portions, and placed in the oven to be baked into loaves. During the brief interval of time that has been consumed in the fermentation of the dough, some very intricate changes have ensued.

Wheaten flour may be described as composed, say, in 100 parts, of the following approximate proportions:—

The causes of these variable proportions being referable to different varieties and to climate.

After the fermentation has proceeded some time, if the dough be examined it will be found to have suffered a loss of sweetness, arising from the destruction of the sugar contained in the original flour.

Before proceeding further it will be necessary to explain that there are several distinct kinds of sugar, which, though having a general family resemblance, yet differ from each other in certain important particulars. The first and most important one upon the list is ordinary sugar of the shops, obtained principally from the sugar-cane in various parts of the world; and also very largely in France from beetroot, and in America from the sugar-maple. This sugar also exists partially in honey, and, generally speaking, in most grains and seeds. Its composition is as follows:—

The next sugar upon the list is grape sugar or the sugar of fruits. This sugar is present in all acid fruits when ripe, and is in short the source of their sweetness. Weight for weight, it is, however, three times less sweet than cane-sugar. Chemically speaking, the only difference in the composition of cane and grape sugar is that the latter contains the elements of one equivalent of water more than the former. It is therefore—

There are other sugars, samples of some of which may be found upon the table, including "milk sugar," the peculiar sweetening principle of milk; "manna," a peculiar sugar entirely distinct from ordinary sugar, and said to be not liable to fermentation; and eucalyptus sugar, found under some of our native gum-trees; also glycerrizine, the sweetening principle of licorice.

With most of these, however, we have at present nothing to do; our inquiries will be confined to the two first.

If cane sugar be required to be fermented, it must first be converted into grape sugar; this, as I have already explained, is easily accomplished by appropriating to itself the elements of one atom of water, as in the diagram, a step which it performs for itself, under the influence of the fermenting principle—viz., yeast. The process now goes on, and the following changes take place in the sugar:— 4 eq. Carbon 4 eq. Carbonic 1 eq. Crystallised Cane Sugar 171 8 eq. Carbon Acid 88 1 eq. Grape sugar 8 eq. Oxygen 1 eq. Water 9 4 eq. Oxygen 12 eq. Hydrogen 4 eq. Alcohol 92 180 180

It will thus be seen that in manufacturing alcohol from ordinary sugar the weight of the product is about half that of the sugar employed, or about the same weight of proof spirit, about one-half of which is water.

In the ordinary process of bread-making precisely similar effects result from the action of the yeast; the sugar contained in the flour is converted into alcohol and carbonic acid, both of which become expelled during the process of baking, thus assisting the bread to rise and acquire that light, spongy appearance so much esteemed in good bread.

A good many years ago a company was started in London for the purpose of collecting and utilising the alcohol eliminated from baking bread, condensers being used for the purpose; but rival bakers, taking the alarm

at the threatened injury to their businesses, diligently denounced the whole scheme, representing to their customers that such baked bread must be inferior to the ordinary kind, by virtue of having had all the "'whiskey' taken out of it!" and so successful were they that they eventually succeeded in stifling the novel enterprise. Since that time, I believe, no further attempts have been made to utilise the alcohol so formed, but it has been suffered to go to waste with the escaping carbonic acid.

In referring again to the list of products of the fermentation of sugar in the diagram, it will be observed that there has been no loss of material, the total amount of carbonic acid and alcohol produced equalling the weight of the sugar employed, and the question naturally suggests itself as to how the yeast acts so as to bring about the decomposition of the sugar; had any of the elements of the sugar been abstracted the process would be more intelligible. At present I am unable to give any precise explanation; the two bodies seem, as it were, not in any way to exchange particles. The sugar gives nothing to, and receives nothing from the yeast; yet by some peculiar sympathetic impulse, no sooner does sugar come in contact with the decaying gluten of the yeast than it becomes disturbed in its structure, and resolves itself into two bodies of simpler constitution and more stable character; for it is a general law in organic chemistry that when complex bodies change they do so into others of a simpler kind, the process being as it were a downward one, tending to reduce the substances changed more nearly to the comparative simplicity of the inorganic or mineral kingdom, from which they can be again elevated only by vegetable life under the restoring influence of the sun.

The products of ordinary fermentation, as the diagram shows, are alcohol and carbonic acid, the former remaining in the vat, the latter escaping. By passing the gas from the fermenting vat into lime-water it will be retained, and may be collected.

The alcohol remaining in the vat of fermented liquor imparts the stimulating and intoxicating property to it for which it is valued. Alcohol, though resembling water in appearance, differs physically in two points—it boils at a much lower temperature, and a gallon of it weighs 2 lbs. less than a gallon of water would. Hence, a liquor containing alcohol can have it readily separated by distillation. I have here a sample of liquor containing alcohol; I take a given quantity of it, for convenience sake say as much as will equal the bulk of 1000 grains of water; by now subjecting this to distillation I shall be quite sure all the alcohol will come over first; and by then weighing the product, and referring to certain tables, I shall ascertain precisely how much alcohol was contained in the liquor. This is the process always adopted to ascertain the strength of sweetened or mixed liquors. The process adopted by the Customs is to take what is termed a hydrometer, an instrument that partially sinks in water and spirit to a point proportionate to their gravity, the lighter and stronger the liquid the deeper the immersion, the degree being marked upon a scale attached.

We will now endeavour briefly to point out some of the properties of the products of fermentation.

Carbonic acid is, under ordinary conditions, an invisible gas, but may by pressure be liquified and even frozen. Being about half as heavy again as common air, it sinks in the latter, and may even be poured out of one vessel into another; and as it cannot support combustion, burning bodies are instantly extinguished when immersed in it.

It constitutes the "choke-damp" of miners, and is elimi- nated in vast quantities from volcanoes and certain mineral springs. It is the constituent which gives to lemonade, soda-water, bottled ale, and champagne their briskness, and is one of the final results of the combustion of fuels in open fires; also the matter into which a large proportion of the substances taken as food ultimately passes, being eliminated from the lungs in every expiratory breath.

Finally, carbonic acid is the main support and principal food of plants, being by them broken up into its constituents and reunited to other substances, such as nitrogen, hydrogen, phosphorus, and sulphur, ultimately reappearing in the form of grasses, fruits, trees, and flowers, for the use of the animal portion of organised creation, to give them food and life and enjoyment—to clothe the earth and fill it with beauty.

Alcohol, the other result of the process of ordinary fermentation, must now engage our attention. I have shown you how it may be separated from liquids containing it; let us now inquire into its properties. Here is a bottle containing some. A clear, colourless liquid, resembling water, very combustible, pleasant, and warm when drank; an agreeable perfume; very exhilarating; and in excess, intoxicating. When largely diluted it absorbs oxygen rapidly from the air, and becomes converted into acetic acid or vinegar. On the large scale this is effected by filling a vessel, having a false bottom, with some very porous material, such as beech wood chips, and pumping upon them very weak alcohol, and allowing it to percolate through the chips and out of the bottom of the cask, from which it is repeatedly returned. By this means, atmospheric air being freely admitted, oxygen is rapidly absorbed and vinegar produced.

As a lecture experiment platinum black may be taken instead of beech wood, as it still more rapidly causes the conversion of alcohol into acetic acid, readily shown by its action on litmus.

Alcohol is said to be the hydrate of a compound base termed ether, or one atom of ether combined with one atom of water; and under certain conditions, these bodies may be separated.

Ether is a remarkably volatile liquid, boiling at the temperature of the hand, and producing great cold upon the surface of the body it is leaving. Advantage has been taken of this property for the artificial production of ice, as in Harrison's patent, at present worked successfully in Victoria.

The following diagram shows the difference between the composition of alcohol and ether:—

Ether is a base somewhat analogous in its chemical relations to the more fixed and durable alkalies and alkaline earths, and like them has the power of uniting with and neutralising acids producing characteristic compounds. We are thus introduced to a whole class of chemicals, many of them of a very interesting character. Its combination with hyponitrous acid is the origin of the "sweet spirits of nitre" of the shops, and is considered to resemble the flavour of apples. It is much used to impart flavour to the article known as imitation or artificial brandy.

With acetic acid it produces acetic ether, one of the ingredients also largely used to flavour artificial brandy. With butyric acid, one of the constituents of rancid butter and old cheese, it forms butyric ether, remarkable as proving to be identical with the peculiar flavouring principle of the pine-apple. If we distil alcohol with excess of sulphuric acid, we still further break it up and produce defiant gas. The flavour of various wines are due to the presence of a variety of vegetable ethers, produced by the slow and long-continued action of the acids contained upon the alcohol, especially when warmed; hence the bouquet and general improvement which good wines acquire by being long kept. Hence also the rawness, want of fragrance and flavour, usually noticed in very new wines.

To Pasteur belongs the credit of having discovered that wines may be artificially matured—that is to say, that the various flavouring ingredients and ethers may be easily developed by keeping wines for a certain time at a temperature of about blood heat. This discovery has been very useful to wine-makers and storers availing themselves of it.

The ether which more especially predominates in good wine, and as a consequence in good brandy too, is termed enanthic ether, and is a product of the action of tartaric acid upon alcohol in wine. It was originally discovered by Professor Liebig.

Most fermenting liquors contain, in addition to sugar, cellulose substances, such as the fibrous matters of grains and their skins, and, during the process of fermentation, especially if the temperature be somewhat high, and the solution free from acid, or still worse, alkaline, it has been found that the decomposition going on in the yeast and sugar becomes more or less communicated to them also. This need not surprise us, for when we reflect that these substances, however much they may differ in appearance, are composed of the same elements, as nearly as possible in the same proportions, it does not appear very wonderful that they should, under suitable conditions, be subject to the same sort of changes.

To those among you who may not be aware, I may as well state that there are in the vegetable world a number of very familiar substances so closely allied that chemists have termed them "isomeric"—that is to say, identical in composition, but different in form. Thus, in the class alluded to as concerned in fermentation, to which sugar belongs, we find gum, starch, cellulose (as in cotton wool), and cane and grape sugar; all these are as nearly as possible, if not absolutely identical in composition, and may indeed be often easily changed into one another. Thus, by long digestion in weak acid, starch becomes converted first into gum, and then into sugar; and if cotton wool or linen be subjected to the same treatment a sufficient length of time, the whole will disappear, and in their place a quantity of sugar, analogous to that found in fruits, will be formed.

In distilleries, where the object is to obtain the largest possible yield of alcohol from the saccharine materials, the process of fermentation is carried on to the uttermost, and not stopped as in brewing, before one-half of the sugar has been decomposed. Under these circumstances it is found that considerable quantities of cellulose become entangled in the peculiar decomposition of the ferments, and have imparted to them a similar decomposition. In this case, however, ordinary sugar alcohol is not produced, but instead we have a new body, possessing many of the physical properties of alcohol, but in other respects differing entirely. This new body is "fusel oil," so called from its somewhat insoluble character in water and oily appearance. When examined, fusel oil was found to have a somewhat similar relation to ordinary alcohol that the various sugars have to each other—members of the same family, having a family look, and partaking to a considerable extent of family peculiarities, but nevertheless distinct, and differing in character as much as brothers and sisters of ordinary human families usually do. True, the new body is a liquid, light and combustible, but boils at a heat exceeding that of alcohol. If we oxidise it we do not convert it into vinegar, but into a volatile acid possessing many of the leading qualities of acetic acid, yet altogether distinct. We produce valerianic acid, so called from it being always found among the class of plants called valerians, to which it imparts a peculiarly unpleasant smell. The root of the valerian officinalis particularly abounds in it, and is on that account used medicinally. A large class of valerianates are known, corresponding with the acetates, and like them always smelling of the acid. When we attempt to produce ethers from fusel oil, as in the corresponding alcohol series, still more startling discoveries are made, for when formed it has been found that the flavour of many fruits make their appearance;

thus, with acetic acid an ether is formed, having the flavour in a highly concentrated degree of jargonelle pears, now much used to flavour sweetmeats. By varying the combinations several other flavouring essences have been produced having more or less similarity to well-known fruits. I have on the table essence of pine-apple, pear, black currant, cherry, apple, raspberry, all thus artificially prepared.

In the ordinary preparation of wines there are many circumstances which influence the result; thus, it has been found that if rapidly fermented, or at too high a temperature, a series of unpleasant ether's become formed in the wine, amongst which acetic ether is usually predominant, imparting that peculiar "mousey" flavour so often noticed in badly-made colonial wines.

There can be no question that the lower the temperature at which fermentation proceeds, and the more slowly it is effected, the better and more delicate will be the wine. It has even been found that the same grape-juice produces better wine when fermented in small vessels than when very large ones are used, the reason being that small bodies of liquid do not become so much heated as larger ones during fermentation, and also cool sooner afterwards. Even brewers have long been aware of this fact, and usually cool their fermenting liquors by means of spirals of cold water flowing through them.

The choicest Rhenish wines are made from grapes that grow in comparatively cold places, so that in point of fact they rarely ripen. Indeed it has been found that the best wines cannot be made in hot climates. In Europe, wines are often fortified and improved by boiling down the juice of the grape to a small quantity, and then mixing this concentrated syrupy extract with a portion of grape-juice not yet fermented; by this means greater body and sweetness become imparted to the mixed wine, and it loses a considerable proportion of the tartar so prevalent in many inferior wines. A reference to the chemical nature of tartar will explain this. This substance is a compound of tartaric acid and potash; it is not very soluble, requiring about 100 times its weight of cold water to dissolve it. Small as this quantity is, it becomes still less if alcohol be present; hence during the conversion of grape-sugar, in the process of fermentation, the wine becomes unable to retain the tartar in solution, and it becomes precipitated. An experiment will illustrate this.

My friend, Mr. Knight, who established a large vineyard at Riddell's Creek, informs me he can now make any kind almost of sweet liqueur wines, by previously in this manner concentrating his grape-juice. On one occasion, where the concentration had proceeded rather far, he was surprised to find the vessel in which it was stored nearly half-filled with crystals of tartar and other solid matters that had been deposited, the remainder of the liquor being a deliciously syrupy liquid, admirably adapted for fortifying and giving body to thinner varieties, and producing a wine less acid and better flavoured.

All fermenting liquids produce flavouring alcohols or fusel oils peculiar to themselves; and so persistent is the flavour thus often produced, that it cannot be got rid of. Whisky from malt, potato spirit, beetroot alcohol, arrack from rice, geneva from rye, and brandy from grapes, all have their peculiar flavours by which they may be distinguished; and by this means adulterations of the more expensive kinds may be detected. Simple evaporation upon the palm of the hand will often suffice. I have, in virtue of the difference existing in the various spirits, often detected the spurious Hamburgh wines, which used to be frequently imported here, and which were quite innocent of ever having seen a vineyard.

It has been found that in fermenting liquids, fusel oil is not produced, if certain aromatic substances, such as hops or cloves, be present, unless a very high temperature be used. Hence in well-made beer it ought not to be found. I have, however, often discovered it in colonial beers, especially some five years ago, when I undertook a series of examinations for the Royal Commission appointed to consider the Licensed Victuallers Act. Since this time, however, there have been numerous improvements in beer, and now, I believe, most of that sold, at any rate in Melbourne and suburbs and in the principal towns of Victoria, is good and wholesome.

Hops contain an aromatic volatile oil which may be separated by distillation from them. In the brewing of beer it is necessary to boil the hops. Now, it is quite possible to do this too much, so as to cause the evaporation and loss of oil of hops; hence when such wort comes to be fermented, it has lost much of the protecting ingredient that should prevent the formation of fusel oil. Thus it was that in years gone by many of the beers then made became thus contaminated with a disagreeable and unwholesome ingredient, recognised by connoisseur's as the "twang," so much complained of formerly in colonial beer. Since the period spoken of, however, our brewers have adopted a more rational process, and do not boil the hops so much as formerly.

Another cause for the occasional formation of fusel oil in beer is when the hop is only sparingly used, other bitters, such as quassia or gentian, being substituted.

Besides the ferments as yet spoken of, and so familiar to us in connection with bread, wines and beers, there exist in nature many other kinds of ferments; indeed their name is Legion.

All seeds owe their gemination and development into plants to a species of fermentation first set up in them.

A seed—say, for example, a bean—is composed of three essential parts—viz., the embryo, the radicle, and the cotyledons. The embryo is the future stem, the radicle is the destined root, and the cotyledons are

storehouses of provisions.

When placed in a suitable place where it can grow—that is, under the influence of moisture and warmth—some peculiar changes commence. The cotyledons, which are filled mostly with starch and albuminous substances, begin to change—a ferment has been generated; the ferment slowly but surely converts the whole of the contained starch into sugar, which, being soluble in water, can be absorbed by the infant plant for its nourishment, and it begins to grow; if we may be allowed the comparison, it represents the mother's breast-milk to the young suckling.

We have here a beautiful illustration of that ever-to-be-found beneficent forethought of the Creator that never ceases to provide for the wants and preservation of all His creatures, in the storing away in the cotyledons of the seed of food in an insoluble form, so as not to be dissolved and washed away by the rains of winter, and only slowly altered as the needs of the growing plant may require it.

The process of malting is founded upon fermentation. Barley thrown into a heap, and moistened, begins to germinate. A ferment called diastase is formed in the gluten, by virtue of which much of the starch is converted into dextrine and sugar, and the plant begins to grow. When it has arrived at the proper stage of maturity, the vitality is destroyed by heating the grain over a kiln erected for the purpose, and we have malt. Malt, then, is simply barley that has germinated. When this malt is again wetted in the mash-tun during the process of brewing, at a temperature not too high, the ferment proceeds to complete the conversion of the remaining dextrine, and the whole becomes converted into sugar.

I have here an infusion of malt, and I wish to show you with what facility this conversion of starch takes place when the two are mixed.

All kinds of seeds are obliged to germinate in a manner corresponding with the before-going, in order that they may grow and develope their peculiarities. If an ordinary bitter almond, for instance, be examined, it will be found to have no smell until it is mixed with water and fermentation excited in it, when the peculiar flavour of bitter almond oil becomes at once apparent.

Bitter almonds contain a principle called amygdalin, which may be extracted from them by boiling alcohol, and it is to the decomposition of this substance under the influence of the ferment peculiar to almonds, that the new bodies are formed.

If amygdalin be rubbed in a mortar with water by itself, no change takes place, but it cannot be mixed with the fleshy part of an ordinary almond, even a sweet almond, without suffering decomposition.

If an ordinary sweet almond be rubbed up with water in one mortar, and some amygdalin in another, no effect is produced till they are mixed, when the smell of almonds is at once apparent. Ordinary table mustard has similar properties. Black mustard seeds, from which the best mustard is made, contain a principle corresponding to amygdalin called sinapin, and when treated like, the almond with water, the fleshy part of the seed at once sets up a fermentation, especially if warmed; and the result is that the sinapin, like the amygdalin, breaks up into several principles, among which the volatile oil of mustard, from its extreme pungency, is the most conspicuous. So long as the mustard is kept dry, no such change is produced.

Fermentation in the vegetable kingdom is much more common than may be supposed. It is, for instance, certain that to its influence the delicate perfumes arising from growing, and especially flowering plants, are to be referred. The (as yet) undeveloped bud contains the juices that upon the further opening of the flower are to commence to ferment by exposure to sunlight, warmth, and air; the results being, amongst other things, the sweet-smelling odours, and the honey which the busy bee so diligently collects.

If a handful of flower's—such as cowslip, violet, elder, or linden flowers—be placed in a fermenting liquor, the bouquet of the flower becomes communicated more strongly than could be effected by simply adding the distillate of one hundred times the amount, thus showing the marked effect of fermentation upon the juices of the flower; and it is said that advantage is often taken of this circumstance by vignerons to artificially impart some favourite bouquet to wines that only naturally are grown in some few favoured spots. It is said, on the authority of Liebig, that sage and rue are thus added, and thus some of the most celebrated wines imitated; but whilst, however, in the genuine product such flavour is permanent, the imitation is not so, but soon passes away. Brewers often take advantage of the same circumstance to impart a delicate hop flavour to beer by putting a few hand-fills of hops into each cask, to be filled with new beer that has not ceased fermenting.

It is well known to farmers that all old, well-stacked hay is sweeter and more relished by horses than new hay; also, that it has more fragrance or aroma. The cause is, that after it is stacked a species of fermentation sets in, the mass warms, and sugar and some flavouring ingredients are produced.

The very familiar article, "tea," is not sold in the condi- tion in which it is grown; if any person examines the leaves of the tea-trees to be found in our botanical gardens, he will be puzzled to trace any resemblance to ordinary tea, either in taste, smell, or colour. The peculiar properties of tea that render it so much esteemed do not exist in the growing plant, but are produced by subjecting the leaves to a peculiar fermentation during the process of drying.

The green leaf of tobacco, again, possesses none of the well-known properties of ordinary smoking tobacco; these are, as in tea, all developed by fermentation during the process of drying.

The ripening of fruits is the result of a fermentative process by which the starch so largely contained in all green fruits becomes converted into sugar.

In the animal economy the process of digestion is referable to a fermentative principle, "pepsine," present in the stomach, and the action of rennet upon milk in cheese-making is produced by the same substance, rennet being only the stomach of a calf cleaned and preserved. Dyspepsia is often only fermentation in the stomach. The difference between new and old cheese is the result of fermentation; indeed, a cheese that is quite new has no flavour whatever, consisting simply of curds and salt; but after it has been placed in the ripening-room a certain time, the new cheese warms, ferments, and develops the well-known flavour of cheese. The souring of milk is due to a species of ferment called lactic acid. Even hams and bacon undergo a peculiar ripening flavour by being kept, not existing in them when in the green state; and the longer they are kept the more pronounced does it become, and the more valuable the ham, so long as it is not allowed to become rancid. The Westphalian hams imported into England were remarkable examples of this extreme development of flavour without rancidity. Most of our colonial hams are little better than dried salt pork, and are singularly destitute of that rich flavour one was accustomed to find in Cumberland or Yorkshire hams. I am told that the climate has much to do with this, the best results being obtained in cold climates and very slow processes.

The changes which the best fresh butter suffers by keeping are induced in it principally by the fermentation of the milk not perfectly extracted from it, and it has been found that if required to be long kept, great precautions are necessary to effect the complete removal of the latter sub- stance. Here, again, climate interferes, as it is much easier to separate milk perfectly from butter in cold than in warm climates; England, Ireland, and New Zealand will always therefore have advantages over Victoria in the perfecting of their dairy produce.

It is now well understood that many diseases which flesh is heir to are produced by various ferments. That terrible one known as diabetes is an instance in point. In this case a certain diseased organ of the body cannot come into contact with starch without immediately converting it into sugar; the two bodies excite each other to increased action; hence, to effect a cure or an alleviation of this malady, it is customary to recommend abstinence from all food containing starch; such fermentation being thus prevented in the body, the diseased organ is not excited, but has a chance, with treatment and care, of casting off the diseased condition, and becoming again healthy.

All contagious and infectious diseases are now referred to the action of ferments of similar kinds, communicated from one diseased individual to another previously in good health, and that in these cases the peculiar disease is always reproduced, with all its old symptoms and characters, to be again propagated, if opportunity offers, amongst fresh subjects.

We will now, before concluding, devote a few minutes to the causes of fermentation as now understood by philosophers.

To Schulze and Schwann the credit belongs of having first pointed out that if, before admitting air to a body capable of fermentation, that air be first passed through a red-hot tube, no fermentation was produced, and this led to the belief that the atmosphere contained germs or seeds which, becoming deposited upon suitable substances, set them fermenting by establishing a growth. Many close observers have since then, by means of the microscope, established the presence of such growths in fermenting bodies. Helmholtz went further, and showed that by separating a fermenting liquid from one not undergoing that change, by means of a membrane, such as a piece of bladder, porous enough to allow the fluid to pass through and become intermixed, but stopping the passage of solids, the fermentation process was not communicated through; therefore the cause of the development of fermentation in a suitable liquid must lie in something which cannot pass through membrane. He therefore naturally attributed it to some solid substances.

Since then Schroeder and Dusch ascertained that these germs might be separated from air by simply filtering it through cotton wool, but it was left to Professor Tyndall finally to clear up the point, he has demonstrated that ordinary air, to rise the words of Professor Huxley, is no better than a sort of stirabout of excessively minute solid particles; that these particles are almost wholly destructible by heat, and that they are strained off, and the air rendered optically pure, by being passed through cotton wool.

To Pasteur, however, belongs the distinguished honour of having proved that germs really are filtered out by the cotton wool from air, for upon subjecting to microscopic investigation, he detected germs in the matter so filtered, and proved their power to excite fermentation when simply sown in a solution fit for their development.

Surgeons have long been aware of the danger of allowing air to gain admission into wounds, which would then fester and give rise to the most alarming symptoms, the germination of spores thus gaining admission being the cause. The beneficial effect of cotton wool as an external application to burns and scalds can now also

be understood.

Pasteur not only ascertained that sperms were constantly floating about the air, but he also discovered that they abounded more in some places than in others, being plentiful in plains, and diminishing in number at great altitudes, as on the sides of mountains. I do not remember whether Pasteur carried on his observations at sea also, but the well-known length of time that meat keeps when hung up to the rigging of vessels may be due in some measure to the comparative absence of spores in sea air.

My own personal observations have shown to me that these germs are very numerous in forests, and on several occasions when I have taken a tent and camped for a few days near Fern-tree Gully, amongst the Dandenong Ranges, I have always found that meat very rapidly became putrid, unless salted; and, upon inquiry, I ascertained this to be the experience also of the settlers in the neighbourhood.

There can be no doubt that ordinary butchers' meat keeps longer when due regard has been paid to cleanliness, both in the abattoirs and in the places where it is subsequently stored.

It is also well understood that many diseases are largely propagated in consequence of the gross neglect of cleanliness amongst the inhabitants of certain districts, for every bit of organic dirt allowed to lie about and putrefy becomes the centre and source of millions of spores, ready to be diffused around, or, as very sensibly suggested by Dr. M'Crea, the Chief Medical Officer, perhaps carried by flies to fresh and even distant subjects. By no other means, indeed, could the somewhat recent appearance of small pox in different places be accounted for.

Plants are also subject to the attacks of germs, and it cannot be doubted that smut in wheat, and the grape disease, and potato disease, are produced thereby.

It appears that insects are peculiarly liable to these attacks. In autumn, may often be seen upon windows dead flies, surrounded by a sort of white, woolly substance. Upon examination it has been found that the white substance consists of innumerable spores cast off in all directions by a minute fungus called "*empusa musa*," the spore-forming filaments of which stand out like a pile of velvet from the body of the fly, whilst the roots have taken complete possession of the fly's body.

The silkworm has long been known to be subject to a very fatal contagious and infectious disease called the "muscardine;" this disease is entirely due to a fungus. But of late years a still more serious disease has broken out amongst the silkworms, called the "pebrine," and has proved so destructive that it is estimated that the direct loss to France alone, in seventeen years, cannot be less than 50 millions sterling, to say nothing of the indirect loss caused by stoppage of looms and loss of employment.

In 1858 the gravity of the situation caused the French Academy of Sciences to appoint commissioners to devise some method of stopping, if possible, the plague. Some naturalists took one view and some another, till at last the French government despatched Pasteur to study it, which he did most perfectly and completely, the result being that the cause was again assigned to germs of a peculiar kind. As might indeed be imagined from his previous training, Pasteur was early led to suspect the true nature of the malady, and of devising a method of extirpating the disease, which has proved to be successful wherever it has been properly carried out.

I shall conclude this lecture by quoting the words of Professor Huxley, at the conclusion of his inaugural address at the meeting of the British Association, hold at Liverpool, September 14th, 1870;—

"Looking back no further than ten years, it is possible to select three—1863, '64, and '69—in which the total number of deaths from scarlet fever alone amounted to 90,000; that is the return of killed, the maimed and disabled being left out of sight. Why, it is to be hoped that the list of killed in the present bloodiest of wars will not amount to more than this! But the facts which I have placed before you must leave the least sanguine without a doubt that the nature and the causes of this scourge will one day be as well understood as those of the pebrine are now, and that the long-suffered massacre of our innocents will come to an end.

"And thus mankind will have one more admonition that 'the people perish for lack of knowledge,' and that the alleviation of the miseries and the promotion of the welfare of men must be sought by those that will not lose their pains in that diligent, patient, loving study of all the multitudinous aspects of nature, the results of which constitute exact knowledge or science."

Nitrogen: its Economy in Nature.

A Lecture, DELIVERED BY William Johnson,
President of the Pharmaceutical Society of Victoria,
On 2nd November, 1871.

THE world around us has been ascertained to be built up of certain materials of diverse character called elements. Modern chemistry has increased the number of these bodies, from the comparatively few known to the ancients, to some 66 or 67 contained in the list before you. There are probably many more, but up to this

time no further increase has been recorded. Of these substances the greatest number are metallic, generally found in combination with one or more of the other elements, and, with the exception of gold and platinum, rarely found free; and the same may be said of the other elements, for if we except oxygen, nitrogen, sulphur, and carbon, none of the rest are found uncombined in nature. Thus the great receptacle of chlorine is the sea, where it exists united to sodium to form common salt; hydrogen is associated principally with oxygen to form water; phosphorus with oxygen and lime to form bone earth; and so on with the rest, it being very rare to find any of these bodies free. There are, however, two very notable exceptions, nitrogen and oxygen; these two bodies, when simply mixed together in a free state in the proportion of about four to one, forming the great bulk of the air we breathe.

Nitrogen, the element we are called upon to study this evening, is under all ordinary circumstances a gas more remarkable when in a free state for its negative properties than for any other characteristic. It forms about four-fifths of ordinary air, the remainder being oxygen; At one time it was considered that nitrogen acted more as a diluent of oxygen than anything else in the atmosphere, and it was said that if it were not for the presence of this substance every combustible on the face of the earth would be consumed, and all life perish; for when oxygen gas in an unmixed state was examined, it was found to accelerate combustion to a most extraordinary extent, and bodies that burnt in air only slowly, or perhaps not at all, when placed in oxygen gas were found to do so with great rapidity.

There is no doubt that in the atmosphere nitrogen does act as a diluent of oxygen, but then this is only a part of its uses. Nitrogen may be prepared moderately pure by burning some substance in a confined space of atmospheric air that shall thus absorb the oxygen, such as a piece of phosphorus.

I before mentioned that we were conscious of the existence of some 66 elementary bodies; but though we call them simple substances and speak of them as elements, yet the truth must be confessed that not one of the so-called elements has been or can be shown to exist in an entirely independent state, or unassociated with an unknown principle which we term "force," a principle with which it enters into intimate union, and cannot be separated from except by substituting something else for it. For example, take the metal iron, one of the names on the list of elements: we find by experiment that it will unite with oxygen, that in fact it will rust by exposure; we also find that it may in pure oxygen be made to combine so rapidly as to ignite and give off heat and light. Now, the question suggests itself, whence came the heat and light? obviously they must have come from either the iron or the oxygen, or both; and this is exactly the point I want to press upon your attention. Heat and light exist in combination with all the known elementary bodies in certain fixed definite quantities that may be calculated. It has thus come to be understood that the quantity of heat given off by an elementary body in the act of combustion will be in exact proportion to the number of atoms burnt, without any reference to their weight. Thus, for example, an atom of iron is 28 times as heavy as an atom of hydrogen; but, as an atom of one body always contains the same amount of heat as an atom of another, be the weight what it may, it follows that 28 lbs. of iron will give off in burning no more heat than 1 lb. of hydrogen. The product of the combustion of iron will now be a compound of iron and oxygen, both of which elements have been deprived of the heat contained in each previous to their union with one another.

The notion that what are called elementary bodies are simple substances is therefore obviously incorrect; they are, in fact, definite compounds of some unknown substances with a force, the existence of which we recognise as heat and light, and which can only be separated from them by substituting some other combination, when the character of the substance becomes altered, nor can they ever be restored to their original condition unless this lost force is again given back to them. This may, however, be done in a variety of ways, of which the principal consists in directly mixing them with some other compound containing heat or "force," usually some of the compounds of carbon, as coal or charcoal, when the metal may have restored to it the forces it has lost, and made to reassume its original appearance. The following diagram illustrates this :— Iron Oxygen Iron Force Oxygen Force Oxide Iron Heat & Light Carbon Iron Oxygen Force Carbon Metallic Iron Carbonic Oxide

The diagram explains generally what occurs in ordinary cases of union between elementary bodies, such union being usually accompanied by the elimination of force in some form or other, either as light, or heat, or electricity. That such forces do not necessarily depend upon a supply of oxygen, but may be equally produced by substituting other elements, can be shown by the energetic action of some of them, such as chlorine, which, when mixed with some of the metals, produce a sort of combustion. With antimony this is very marked.

Again, amongst the elements is phosphorus. By suitable contrivances this substance may be made to combine with chlorine and oxygen under water, and even under these circumstances we shall have heat and light given off, which the water is unable to quench.

I have here tubes containing metallic lead in a minute state of division, prepared by a chemical process. When the contents are allowed to come in contact with the oxygen of the air, the two enter into such rapid union that again we have heat and light expelled, and *inert* oxide of lead formed.

When oxygen and hydrogen unite, a great deal of force is disturbed, and water is generated. Water, then, is a compound of oxygen and hydrogen that have both been deprived of the latent forces existing in them when in a free state. I have here a flame of hydrogen; by its union with the oxygen of the air steam is produced, and when this is condensed, water.

As the equivalent or atomic value of hydrogen is only 1, and oxygen only 8, we might expect a great deal of force to be eliminated by the union of these gases, the two atoms, together weighing 9, containing previous to combination as much latent force as two equivalents of any other elements, in the case of iron weighing 56. I have here a mixture of oxygen and hydrogen, which I will cause to unite, and I will then show you what a deal of force, in this case eliminated in the form of heat, is evolved.

Water, the final result of the union of oxygen and hydrogen, is of course destitute of force. Nevertheless, these elements may again be separated from each other by restoring to one or both the forces originally contained in each before combustion. A piece of an oxidisable metal, such as iron, will slowly effect this; but with some of the alkaline metals, such as sodium and potassium, both of which contain force, the restoration of the hydrogen is effected with great violence, and even ignition, the hydrogen, as it is expelled again, taking fire in the air.

By substituting a current of electricity for the metals in this case, the forces may be restored to both, the oxygen and hydrogen being in this case obtained from the oxidation of certain plates of zinc contained in a galvanic battery.

It is useless to further multiply illustrations; enough has been shown to enable you to understand that what we call elements are in reality compounds of some unknown base (never yet in a single instance isolated) with a certain force, the effects of which are familiar to us under the forms of heat and light, or electricity, as the case may be. The combination of any of the elements is usually then accompanied by the evolution of the forces previously combined with them whilst in a free state. Usually, I say, for this is not always the case; for the element "nitrogen," which we have adopted for our lecture this evening, is a notable exception.

This body appears to have the power of uniting with and absorbing other elements, without causing the disengagement of their combined forces. In this respect no other body can compare with it, and on this account nitrogen becomes in nature one of the most important elements.

How nitrogen in the state in which it exists in the atmosphere first becomes united with other elements is not well understood, but it is known that when vegetable matters decay, nitrogen from the atmosphere is absorbed and ammonia formed, ammonia being a compound of nitrogen and hydrogen; and as ammonia is also the ultimate form that nitrogen in-variably assumes in the natural decomposition of any bodies containing it—such as animal matters—there can be no doubt that the affinity of nitrogen and hydrogen must be very great.

Ammonia, then, is a substance constantly being generated around us, composed of fourteen parts of nitrogen to three parts of hydrogen; it is a gas having very remarkable properties; it is peculiarly pungent to the smell; maybe readily detected in vessels containing it by the white cloud it produces with some acids. It is also a most powerful alkali, exceeding in neutralising power most other bases. It is also remarkable as assuming, under some circumstances, the properties of a true elementary body; and when united to one more atom of hydrogen, can even be made to amalgamate with mercury, exactly like a metallic body.

Ammonia is also remarkable as forming the type of a whole series of ammonias that are found in nature, and which have the same relation to each other, or family likeness, as the ethers and sugars I have referred to in my last lecture on "Fermentation." The substances known as "vegetable alkaloids," to which quinine, morphia, and strychnine belong, and which comprise such a vast body of interesting substances, are all "ammonias," brothers and sisters of the original ammonia we have been speaking of, and formed in vegetables by some mysterious process not understood.

Vegetable alkaloids appear to be ordinary ammonia, with one or more of the hydrogen elements replaced by groups of elements acting as only a single element, a circumstance very common in organic chemistry; hence the variety of such bodies is almost endless.

I just now remarked that under certain circumstances nitrogen had the power of absorbing other elements without necessarily expelling the latent forces contained. Thus, in the formation of nitrates, this takes place—nitrates are formed during the gradual decay of nitrogenised matters, such as animal refuse, under such circumstances that free access of air is admitted, and an admixture of lime or some other basic substance allowed to be present; under these conditions oxygen is absorbed by the nitrogen contained, and a nitrate of the base produced; this substance, when mixed with solution of carbonate potassium and filtered, gives on evaporation saltpetre or nitrate of potassium.

Nitrogen combines with oxygen in five different proportions—

NO1 NO2 NO3 NO4 NO2

The first of these, or nitrous oxide—or laughing gas, as it has been called—is sometimes used as a mild

anæsthetic in place of the more dangerous chloroform, chiefly by dentists. The second is produced by the action of nitric acid upon some metallic substance, or upon starch. The third, fourth, and fifth are formed from the second by spontaneous absorption of oxygen. But the most remarkable circumstance connected with this absorption of oxygen by nitrogen consists in the fact that no force, such as heat or light, are given off during the operation. The nitrogen has absorbed not only the oxygen, but all the forces existing in it when in a gaseous form. These forces it not only absorbs and retains, but even transfers to any salt into the constitution of which it may enter—for example, saltpetre. We can now, therefore, understand what it is that makes nitre or saltpetre so destructive. By way of contrast, let us take phosphorus: this substance also combines with oxygen, absorbing a similar amount of that element that nitrogen does; during the process, however, much light and heat are given off, and the final result is a comparatively inert substance—phosphoric acid, utterly destitute of all the properties that nitric acid is remarkable for, and forming a class of salts, "the phosphates," of very fixed nature, difficult to decompose, and resisting the highest temperatures, no latent force being in point of fact left in them. If I mix nitrate of potass with charcoal and sulphur, it gives me gunpowder; with phosphate of potass in place of nitrate, no effect whatever is produced; and yet the oxygen, the element admitted to be the active ingredient in gunpowder, is present in nearly equal quantity in both. It is obvious, therefore, that the condition of the oxygen must be widely different in the two cases. Here then is the explanation. The phosphorus and oxygen when they became united lost the whole of the latent forces contained in them, the resulting phosphoric acid being a substance, in consequence, absolutely destitute of contained force, therefore quite incapable of indicating any under any circumstances whatever. The nitrogen, on the other hand, not only absorbs the same quantity of oxygen that phosphorus does, but it does it quietly, without allowing any of the forces contained in it to escape or be lost. These forces exist in nitric acid and nitrates, much in the condition of a compressed spring, ready to leap out with destructive violence and suddenness when the balance of conditions by which they are held is disturbed. Hence, in gunpowder the force is to be referred to that original wondrous absorptive power of nitrogen of forces eventually transferred to the carbon and sulphur contained in gunpowder, and, finally, economically applied for propelling shot or blasting rock.

This property of nitrogen to absorb and retain force is very marked in many other instances besides gunpowder; thus, in gun-cotton—a substance that has of late years been used as a substitute for gunpowder, over which it has some advantages principally relating to weight and smoke produced in its use—it is the part played by the nitrogen present that gives it its character. As in gunpowder, here the nitrogen has imprisoned a large amount of oxygen, and all the forces originally held by both when in a gaseous form, and when from any cause the integrity of the compound is interfered with, their forces become released, and away they go. When gun-cotton is ignited in the air, very little light is given off on account of the gaseous nature of the products, and no ashes; but if some solid substances be mixed with it, so as to present a fixed residue for the heat produced to ignite, much light is formed. I have here gun-cotton, mixed with an earthy salt baryta, to supply a solid material that will not be dispersed as a gas. When this substance is ignited, so sudden and brilliant is the effect that I, some years ago, tried to get it introduced to some of our theatres, for the purpose of producing artificial lightning in place of the miserable failures at present made use of, but without success; for, though I succeeded in astonishing many theatrical managers by its marvellous effects, so conservative did I find them, and difficult to move from the old grooves they had been accustomed to, that I at length gave up the task.

There are many explosive compounds into which nitrogen enters and to which they owe their properties, but it will be sufficient simply to mention their names. Glonoine, or nitro-glycerine, is one of these; then we have fulminating silver and mercury, the latter being the material used for priming caps for guns; then come iodide and chloride of nitrogen, the most violently-dangerous substance known.

Professor Fownes thus describes this body:—"It is a yellow, oily-looking substance, that may be distilled at 160° Fahr., although the experiment is attended with great danger. Between 200° and 212° it explodes with the most fearful violence. Contact with almost any combustible matter, as oil or fat of any kind, determines the explosion at common temperature; a vessel of porcelain, glass, or even cast-iron, is broken to pieces, and a leaden cup receives a deep indentation. With phosphorus the explosion is peculiarly violent even under ordinary circumstances; a grain of the substance produces when exploded a report as loud as a gun. In making these experiments great caution is required, the operator covering his face with a strong wire-gauze mask. Dulong lost an eye and the use of a finger, and Sir H. Davy was wounded in the face, by the effects of its detonation." I am sure, under these circumstances, you will excuse me for not introducing this substance personally to your notice this evening, but will leave it to be sought out by the private student in places remote from danger.

Nitrogen combines with carbon, producing a very remarkable substance called cyanogen, which, under ordinary circumstances, is a gas that burns with a peach-coloured flame.

Cyanogen has all the properties of an element, and is capable of entering directly into combination with other elements, or of replacing them in compounds. With hydrogen it produces an acid substance, long well known under the name of prussic acid, the most sudden and deadly poison known. Fatal as an overdose of this

substance always is, yet it exists in many fruits—such as almonds, peaches, apple pips, and the kernels of cherries and plums. Of course the quantity contained in these fruits is very small; but the fact is nevertheless very interesting, as showing that the most deadly poisons, if sufficiently diluted, may become harmless, and often indeed supply most valuable medicines. Thus, in small closes, prussic acid is one of the most powerful remedies for allaying excessive irritation of the stomach, as during incessant vomiting; also for relieving palpitation of the heart; indeed, its action is specifically directed to the heart in preference to other organs, and I may observe that it is by no means an uncommon circumstance for medicines or poisons to select some organ in preference. Thus, whilst prussic acid and digitalis affect the heart, strychnine takes the spine and nerves, arsenic the stomach and skin, morphia and alcohol the brain, belladonna the eye, and so on with others. Hence the poisons, when properly administered, become ofttimes most valuable medicines.

Cyanogen has a great affinity for iron, with which it combines in several distinct ways; that beautiful-looking yellow crystal now present upon the table is a compound of cyanogen, iron, and potassium. In this case the iron appears to have assumed a character altogether foreign to its nature; usually playing in compounds the part of a base, it in this instance plays the part of an acid, and in conjunction with the cyanogen can combine with other bases. With copper, for instance, ferrocyanide produces a deep red-brown precipitate of ferrocyanide of copper; with iron salts, an equally deep and beautiful blue, manufactured on a large scale under the name of Prussian blue. Amongst other uses to which this substance is applied is that of painting tea, of giving that beautiful bloom so pleasing to the eye, at one time thought (erroneously) to be communicated by drying the tea-leaves upon copper plates.

A good many years ago a large trade was done with China in Prussian blue, all of which found its way back amongst the tea imported from there. But at length the Chinese succeeded in finding out the process by which Prussian blue is made, having sent a countryman to Europe for that purpose, since which time they have made their own.

Prussian blue may be easily detected in tea, by simply washing with cold water, when it is removed.

It has long been a matter of wonder how steel was produced. Bars of iron, laid in charcoal and exposed to a red heat, gradually became impregnated with a certain amount of carbon, which somehow penetrated through them during the process of cremation, but how it was enabled to travel through a solid bar of iron could not be explained. Of late years, however, it has been pretty satisfactorily proved that cyanogen is the carbon-carrying agent concerned in the production of steel; hence to nitrogen we are again indebted for all our best articles of cutlery, springs, and steelware generally.

Cyanogen, combined with potassium, produces a salt very much used, on account of its solvent power of silver and gold salts, in electro-plating and gilding; a solution of silver in cyanide of potassium being always used for plating. Indeed so easy is the process, that if a copper coin, or old worn plated spoon or fork, be simply rubbed with a solution so prepared and a little chalk, it will become immediately coated with silver and made to look quite new again. Even brass may be, by similar means, plated upon iron; and in Birmingham it is said that thousands of tons of buttons and similar articles are now regularly coated with brass upon iron bases, thus proving very economical.

On the large scale cyanogen is produced by boiling down together, in large iron pans, a mixture of animal matter, such as the refuse from slaughter-houses and tanneries, with potass and scraps of iron, to dryness and low ignition; the charred mass being then washed with water yields a solution of yellow prussiate of potash, from which salt all the other cyanides are directly or indirectly formed. A patent was some time ago taken out for the manufacture of cyanide by the direct union of carbon and nitrogen, produced by passing air through ignited charcoal, but I am not aware whether that process is now carried on. This country presents very favourable opportunities for making cyanide, from the immense quantities of animal refuse obtainable from our boiling-down establishments and meat-preserving companies, and it has often been a matter of surprise that no enterprising individual has started the new industry.

Nitrogen is intimately associated with life, and is never absent from living vegetable or animal tissues; indeed the degree of vitality in a vegetable or animal substance may be approximately estimated, by the nitrogen contained in it. In the lowest class of vegetables, such as the cryptogamia or sea-weeds, but little nitrogen is found, the quantity increasing as we progress upwards, being abundant in leaves and greatest of all in flowers and seeds; indeed, so general is this the case, that during fruition almost the whole of the nitrogen and vital force associated with it is not uncommonly removed from every other part of a plant and concentrated in the seeds, the stem then withering and drying up, as in wheat, and the agave Americana, or aloe tree, so common in this colony, and which, after growing a somewhat imposing and pretentious plant for seven years, then for the first time flowers, produces numerous seeds, and perishes.

Whilst wheat, oats, or barley are green, every part of the plant teems with nutriment, and if cut down in this state and dried, makes excellent hay; if, however, they be suffered to ripen, all this nutriment is withdrawn, the leaf and stem wither and grow yellow, a little straw being finally left, almost destitute of any nutritive

properties whatever, all these having been removed to the ripening grain, destined as seed to produce new plants, or to be consumed as food by animals and man.

Vital force seems in all cases to be derived from the sun by vegetable aid, and to be stored by the latter in nitrogen compounds only, being afterwards transferred to the bodies of animals consuming them as food, and eventually becoming developed in the thousand different forms that constitute life. In the body these principles become gradually divested of the forces within them, becoming more and more reduced to substances of a simpler constitution. Hence it is that the much-used limb becomes harder than the part which has had rest, every motion being an act of life so far reducing the part where it is made. Hence beef from the leg of a cow will not be so tender as that removed from the rump or loin, because of the weight it has had to sustain, and the consequent loss of vital force and change into something inferior, and there can be no doubt that, weight for weight, such meat is really less nutritious than that cut from the best parts; it is therefore very doubtful whether such parts, unless very greatly cheaper, are really economical to use. One cause of the stringiness so general in Australian meat is the travelling the animals have undergone in search of water and food, incidental to a dry climate, every string thus produced representing original good meat, of much greater weight, that has lost its vital power in the process of exercise; indeed, much exercise of any kind is always injurious to meat, and tends to harden it and spoil it. For this reason it is not to be expected that meat produced in a dry climate will ever equal that supplied by well-watered plains, where cattle can eat and drink their fill with the least possible exertion to themselves, and where they may lay down and chew their cud, and rest in peace.

It is on account of the continued exercise that the legs of walking fowls are harder than their wings, whilst with birds that fly, as wild-fowl, the wings are harder than their legs. Even pigs that roam about, and for the most part find their own living, do not make good bacon, and most of our colonial hams are on this account very stringy and hard, and not to be for a moment compared with the delicious sty-fed pork of Cumberland or Yorkshire.

Nitrogen is the principal life-supporting element in the food of all animals. Food that is destitute of nitrogen—as starch, sugar, gum, and alcohol—are utterly unable to contribute anything towards the repair of that continual waste going on in every part of the body. True, these substances may contribute, and doubtless do, to the performance of many animal functions, such as sustaining temperature, and as nervous stimulants; but, inasmuch as they are destitute of nitrogen, they cannot increase muscle, or add anything to the tissues of the body; these are all nearly entirely made up from albuminous materials, originally derived from the vegetable world under the influence of sunshine and suitable other conditions. All plants are laboratories actively engaged in absorbing ammonia, carbonic acid, and water, and by the additional aid of a few mineral substances—as potash, phosphorus, sulphur, lime, magnesia, and iron, with a little silica—breaking them up into their constituents, and re-forming them into the most complex of all known compounds. A vegetable, therefore, may be viewed as containing the very highest and most complex principles of organic life. True, in animals very highly-organised principles are found, but these have in every instance been derived originally from the vegetable kingdom, and during the process of assimilation have suffered a diminution of elevation, being gradually reduced to a somewhat lower level. Gluten, the essential constituent of wheat, during the process of digestion and assimilation becomes modified into albumen and fibrin; no instance is known of albumen or fibrin producing gluten. Again, starch, the next important constituent of wheat, is easily converted into gum and sugar; no instance is known of gum or sugar being converted into starch. So it is in the animal economy: numbers of principles originally derived from the vegetable world are modified and altered into new ones, but the process is always one of destruction—a downward one, tending to reduce the substance to further and still greater simplicity, until it gets finally expelled from the body, expended and useless, and even reduced almost to the condition of a mineral substance.

I think gluten must be considered the highest and most complex form of organic creation; from the downward changes this substance undergoes when taken as food we successively obtain albumen and fibrin of blood, muscular fibre, chondrin (the cartilaginous principle of bones), gelatine, uric acid, and urea; every one of these changes being a downward one—the last, indeed, only half a stage removed from the mineral kingdom.

When an organic body has once been reduced to its primitive elements, there is only one way that it can be restored, viz., by vegetable life. It is not indeed possible to explain how this is by such means effected, but the result is palpable. Principles containing carbon, hydrogen, and oxygen are formed, and others again containing nitrogen; all vital power being contained in the latter. What this vital power is in the abstract we know not; it would, however, seem to be some higher force than heat, light, or electricity, though capable of being converted into any one of these at will. Thus by rapid exercise vital force is converted into heat; by the glow-worm, firefly, and sea animalculæ, into light; by the torpedo and gymnotus, into electricity, all at will; but whilst vital force may produce or be converted into any other force, there is no instance known of heat, light, or electricity producing vital force.

But it is necessary to draw to a close, not that the subject is in any way exhausted, but that the time is, and

perhaps your patience also. I hope, however, I have been moderately successful in engaging your attention, whilst I have endeavoured, in a plain and simple manner, to bring before your notice a few of the important parts played by nitrogen in the economy of nature.

The uses of art & Design in Manufacture.

A Lecture, DELIVERED BY Denis O'Donovan, ESQ.,
On 12th October, 1871.

THE subject on which I have been invited to address you this evening—The Uses of Art and Design in Manufactures—is so extensive that, even if ray condensing powers were far greater than they are, I could not hope to do more in one lecture than to bring before you merely some of its most prominent points. I must crave your indulgence therefore from the outset, if I should omit many things on which some of you might expect me to speak, and should deal with others more cursorily than their importance might seem to demand. It is a subject indeed so extensive that it embraces nearly all the long centuries with whose story we are acquainted, and nearly every object of human wants that the hand of man can produce. For there is scarcely an epoch from about the year 1800 B.C., which is the date of the earliest Egyptian ornament we know of, that does not furnish us with some lesson bearing on the relations of art and industry, and there is scarcely an object of daily use that may not be made "a thing of beauty," if it be only touched by the magic of graceful thought, and fashioned with elegant design.

Do not fear, however, that I am going to trouble you now with any dry and learned disquisition on the arts of the past. I shall not carry you back to look at the workmen of ancient Thebes, culling suggestions of beauty from "the flowery Nile," nor weary you with the old story of Greece, and Etruria, and Home. I have no intention to occupy your time with the efforts of the middle ages to express their strong and deeply-implanted feelings according to principles learned from the broken columns and mouldering arches of a former era; and still less to dwell upon that return to the long-lost verities of antiquity which is described in art-history as the Renaissance. Suffice it for us to know that in the treasury of the past is a rich legacy of thought bequeathed by the masterminds of every country—a legacy of power which, if rightly used, will make us not slavish copyists, but the creators of a living art adapted to our wants, speaking the language of our time, and yet true to those principles consecrated by the sanction of ages. I hope the day will come when, in the Art Gallery of this noble institution, the inhabitants of Victoria will find a large portion of this legacy accumulated for them; and that these heir-looms will be chronologically and scientifically arranged, as they now are in every great public gallery, so as to give a distinct idea of the forms which art took under different circumstances, of its principles, its motives, and technical facts. When that is done, you will require no lecturer to tell you the use of art in manufacture, for you will find them so closely wedded whenever both were in a noble and flourishing condition, that it will be impossible for you to draw a line between them. So close and healthy is the connection between the art which we admire in a picture and the art which allies itself to material use, that, though we have different names for them, they are essentially but one and the same. There is a hierarchy, no doubt, in the different manifestations of talent, and even in the royal doings of genius; but there are the same laws for all, they all have a common origin, and they are all directed to the same end. The study of even the high art of the ancients is as necessary to the artisan who will never paint a picture, as that of Homer and Virgil to the literary student who will never write an epic. In both cases the mind is fortified and refined for whatever work it may be called upon to perform. It is to this art-culture of her working-classes that France owed the proud pre eminence which her manufactures so long held in the markets of the world. In that country, besides the great galleries of Paris, whose preservation from the Vandal fury of the Communists was a source of rejoicing over the whole civilised world, there is scarcely a town that has not a museum and a church adorned with valuable pictures. Lithographs, busts, statuettes, are exposed for sale in every street, and are found in the homes of the humblest *ouvriers*. Art is everywhere, it meets the eye wherever one turns; and the consequence is, as has been proudly boasted, that sound criticism is as often heard in France from the lips of a peasant as from those of a prince. To this education of the taste and of the eye are due, in a great measure, the beauty of form and elegance of design which gained for French manufactures so high a position.

But the hand of the art-workman must also receive its art education. From those models consecrated by universal admiration the hand must learn to trace the graceful line, to wind into the subtle wavings of beauty, and to render with ease and promptness the forms which haunt the imagination. Happily, for some time great efforts have been put forth to spread this education of the hand amongst our working-classes. The Schools of Design lately established are doing much to popularise, not only a mere mechanical power of drawing, but that higher power which is derived from drawing properly directed. In the school attached to this institution it could hardly be otherwise, considering the collection of moulds and casts which it possesses, but I am happy to testify

here that in all the schools with which I am acquainted I have witnessed an invariable desire to place the best models before the pupils. The education of the hand should however come as I have placed it, after that of the eye and the taste; for it is not generally until after one can appreciate better and see more than others, that the power to execute is widely or ardently coveted. I attribute, therefore, a great part of the success which has attended the establishment of these Schools of Design to the fact that a Gallery of Paintings and Casts had already existed for some years amongst us. For before you form schools, you must create the desire to enter them. You must first scatter the seeds of taste which seek for culture, and light up the love of beauty in the heart—that fruitful love which yearns not only to enjoy, but to produce. This, in fact, is the whole history of all true education of any kind, and this is the work which the National Gallery has been doing, as far as its resources would permit, amongst the inhabitants of Melbourne since it has been founded, and which it will continue to do with still greater effect, in proportion as its resources are wisely augmented.

But it may be said, "You surely do not mean us to give an art-education to our working-men. A little drawing may be useful, but all this dreaming and these high-flown ideas would only make them discontented with their station, and bring many of them to ruin." This is an objection I never hear without a feeling of indignation, which I avow it is sometimes difficult for me to repress. Art-training then is only good for gentlemen, and no one else! Be it so; hut why should not a workman be also a gentleman? Even now, "many of them," says Ruskin, "are more gentlemen than your idle, useless people." Why, I ask, should they not have the opportunity to become more so, and to become all the better workmen for the change? For whatever gives real refinement to the worker will be found to give beauty to his work. The fact is—and it is a truth which has been long known in the world, though sternly and stubbornly repelled in England until now—that there is in reality nothing more humiliating in a trade than in the profession of a lawyer or a doctor, a man of letters or an artist. Raphael, who painted the "Transfiguration," and was the friend of cardinals and courtiers, was not ashamed to decorate the walls of churches with floriated designs; and Flaxman, who sculptured the "Archangel Michael contending with Satan," did not think it inconsistent with his dignity to furnish designs for the potter's clay and the workman in metal. A great artist once signed his pictures with pride "Francia the goldsmith." The masters of Michael Angelo and Leonardo da Vinci were goldsmiths, and to the same craft belonged Ghiberti, who beat out the bronze gates of the Baptistery of Florence. What we want now is workmen like to these, and believe me, if ever we are to have them, we must set our faces resolutely against the dismal doctrine of an age of darkness that art-knowledge or any other knowledge is not good for all men, be they who they may, and against that remnant of the ruder ages which stamps with degradation those who with cultivated minds and skilful hands are employed in ministering to the daily wants of life.

But if art in general is useful to the craftsman, that development of it which enables him to determine the most suitable form of every object he has to make, and to inscribe on it, with truth and beauty, all the facts of its material, its construction and its uses, must in particular be needful. This is what is called the art of design. It is not distinct from other art, being merely a special application of it, and can no more be taught by any fixed rules than the art of Phidias or of Raphael. A good designer must be born an artist, he must moreover be a man of careful observation and of much experience, and his taste must be cultivated by the happy influence of beautiful things. This is not to say he can be taught nothing. He can be helped to a more intimate communion with nature by learning those secrets which her ardent lovers have ravished from her in every age, and he can be taught those principles which are gathered from the accumulated observation of all those who have gone before him. The leading principles that have been hitherto established, and those about which alone authorities seem to be undivided, I shall now endeavour to lay before you in the shortest and simplest manner that I can. They will teach us better than anything else how useful, even how essential, is this art in almost every branch of manufacture.

All design is either constructive or ornamental. The first principle concerns both divisions. I give it in the words of Mr. Owen Jones—"Construction should be decorated, decoration should never be constructed;" that is to say, that ornament should be subordinate to construction, and should not be designed without reference to it; for a designer might produce an ornament most beautiful in itself, and yet show the grossest stupidity in its application.

With regard to constructive design considered separately, the most important and best-founded principle is the very simple and common-sense one, that an object must fitly answer the purpose for which it is intended. This beauty of fitness is nothing more than truth, without which art would be degraded to a systematic misrepresentation. Utility is the characteristic attribute of the manufactures of all the great eras of art. Indeed, it would be difficult to find a single example amongst articles of classical workmanship, of which it might be said that it was tasteful and elegant, without being particularly adapted to the especial object for which it was originated. Nor is this quite as simple a thing as might at first sight appear, for it is not enough that an object should be useful for its purpose; every portion of it should be designed with reference to the end in view—that a water-jug, for instance, should not only be made so as to hold water, but should have the handle so placed that

the water can be taken in and poured out with the greatest ease.

Fitness is a quality demanded of ornamental design also. Perfect figure-drawing, or a beautiful landscape, would be out of place on a cup or platter; delicate tints and patterns of flowers would be inappropriate on the meaner kitchen utensils; and even the bellows that enters into the drawingroom becomes a monstrosity when it displays a moonlight view in Venice, or the balcony scene in *Romeo and Juliet*. This much may be said without entering into the lists for or against either of the two bodies of disputants who occupy the arena of ornamental art. Whether room decoration should be by flat patterns and dead colours, or should be by natural art such as that with which Tintoret adorned the Council Hall at Venice—whether a wall should be merely a background to the living figures in the room, or should be alive with lovely children playing amongst the vine-leaves, as Correggio would have made it—is a question which I need not, even if I were capable to do so, take upon myself to decide. Of one thing I feel certain : that decorative art, when wholly unconventional, may be dignified and beautiful, and wholly in its place in certain surroundings, and that in others it may be much less suitable than the inferior forms of a zigzag or a chequer. I am, therefore, no partisan of the extremists on either side of this dispute. The interiors of noble buildings—abodes of kings, and great edifices of the people—claim the highest efforts of art for their adornment; a spoon, or a snuff-box, or a coal-scuttle, are objects with whose uses high art can have no possible connection. Between the palace and the coal-box there are, however, various fields for decoration, and in these I think the artist must be left wholly to his sense of fitness and his taste. Taking it, then, for granted that conventionalism is often necessary in ornamental art, let me remark here that even good conventionalism can never be produced by a workman who has received no training in the higher departments of art. It has ever been so from Egyptian ornament to the purest mediæval of the thirteenth century; how conventional soever was any great school of decoration in the past, the knowledge of the human figure and the most skilled and perfect drawing are everywhere as distinctly to be traced as in the birds, and cherubs, and wreathed foliage of the cinquecento. The same holds good with regard to the drawing of plants, and fruit, and flowers. Even in conventionalism an accurate knowledge of their forms is essential, for every part of a plant or flower, if properly understood, each member of the vegetable organism, if properly delineated, is a veritable ornament; and when we consider there are about 100,000 species of plants, we may form some idea of the vastness of the treasury here awaiting the student. Nor is this all; the study of these delightful objects with which the great temple of nature is adorned, these "stars of the earth," and all the fair profusion of fruit and foliage that surround us, hold up for ever before us in their silent, fascinating beauty those great laws of repetition and alternation, on which much of the merit of good conventional design must always depend.

The conventional art finds its special place in the household—amongst the familiar and useful objects of our homes, but it would nevertheless be absurd to lay down the rule that all higher art should be excluded therefrom. In like manner, it may be said that the loftiest forms of art belong to the great public edifices, yet would it be an error to suppose that even here conventional art can find no place. The golden rule, therefore, is one of fitness. When decoration is beautiful and appropriate, it fulfils all the conditions of perfection. The statues of a majestic Gothic cathedral, as they ascend from the eye into the distance, and lose themselves in the shadows of its lofty arches, are rightly and properly conventionalised for the sake of effect, while the girdle of carved stalls and stone bas-reliefs around the choir is of the highest and most exquisite finish. In the same way, a teapot, ornamented with cherubs in high relief, or a carpet, resembling a menagerie marvellous with strange and savage creatures, are specimens of art falsely applied; but a sideboard, substantial, massive in shape, richly sombre in colour, may not unworthily receive the noble decoration of living forms; and I know no well-founded canon of taste that is violated when a cabinet is beautified with the most elegant pictorial composition, the most finished enrichments of sculpture, and the subtlest chromatic harmonies which the skill of the colourist can produce.

Another principle closely connected with this is that every article of manufacture should be not only fit for its use, and fitly ornamented, but by its design it should indicate the purpose to which it is applied, and should never be allowed to convey a false notion of that purpose. All the traps for the eye, in the shape of boxes that have the appearance of well-bound books, bells that look like inverted tulips, sideboards formed on the models of Grecian altars, and flower-stands treated as ruined castles, are false and vulgar in taste, thoroughly bad and irredeemably depraved in art.

And now, looking about for maxims for your guidance, I find the only remaining one about which there is no serious difference amongst authorities, is that concerning the fitness of design to the material to be used. "Every material (I give it in Sir Charles Eastlake's words) is restricted by the nature of its substance to certain conditions of form." Thus glass or any other brittle substance should not be made into the form of a pillar, the obvious idea of which is strength. Neither should glass be used wherever transparency is not desired. Feathers, or trees, or hair, should not be cut out of marble. Freestone is unfitted for work that requires minute elaboration, and cast iron should never be made to imitate wrought-iron ornament, or stone carving.

These, which are the fundamental principles of design, prove by their bare enunciation how essential is this

art in the production of every object of daily use. Fine art produces beauty and elegance, design weds them to utility and fitness, and thus we see in a general way the uses in manufacture of art and design. But it will be well to go a step further than generalities. I shall, therefore, devote the remainder of the time I have to speak to you to compressing into as narrow a compass as possible some definite notions concerning the particular relations between art in its various developments and each of the principal manufactures that supply our ordinary wants.

The most important, perhaps, of all applications of art to handicraft, is that which takes place in the building of houses. In this land of our adoption, where it is the good fortune of so many to build, or create houses for themselves, this part of my subject assumes a special interest. Not only the character of the houses we are now building depends upon us, but that of the future homes of this country, and the street architecture of its cities will be influenced by our example for generations. Hitherto what we have done can hardly be much commended. A few buildings we have in Melbourne of exceptional merit, but in general it may be said that the least interesting town in all England is not more uninteresting than any of the great cities of Australia. All the ebullitions of uneducated taste in architecture, the vitiated copies of Italian buildings, the base vulgarities of design, the tawdry shop-fronts, the stuccoed terraces, and the thousand other abominations which have long been the reproach of the British isles, have been here ignorantly and slavishly reproduced. As in England, we have unfortunately no national taste in architecture, and hence no one would look for uniformity of purpose, singleness of style, or unity of character, such as we find in the cities of continental Europe; but it is surely not too much to expect that every man who has the means to build should have some idea of the difference between good and bad design, and a wholesome horror of all structural deceits; or failing this, that the professional men in whom he trusts should have a distinct and perfect notion of the essential principles of their art. Let me tell you, in a few words, what these principles are, that you may see how art and design will help you when you are to plan and ornament your homes, or when you are to have them planned and ornamented by others.

Above all things, the house must be adapted to the wants of the family who are to occupy it, and it must be suited to the climate in which it is built. A French *chateau* would hardly meet the domestic requirements of an ordinary Australian family, and the baronial hall or feudal castle of his Norman forefathers would certainly be an uncomfortable dwelling for an English country gentleman of the present day. For the habits which we have acquired in the island homes of our ancestors, the qualities perhaps most requisite in our houses are those of quiet comfort, seclusion, cheerfulness, and a certain air of importance in which there is no admixture of ostentation. If it be the house of a gentleman, he will in addition to all this require it to have a gentlemanly character, that good society may move within its walls smoothly and pleasantly, and that inside and outside it should be agreeable to a man of cultivated taste.

The consideration of climate is to some extent included in that of comfort. Shady balconies and deep verandahs, courtyards cooled with fountain freshness, and open turret and terraced roof from which to enjoy the evening breeze—all these things are conditions of comfort in our Victorian clime. And yet these are things, be it said in passing, which have hitherto not received the attention they deserve, our houses being more adapted to the gloom and chill of an English winter than to the perennial summer of this bright Australian land.

But climate has a relation to ornament as well as to comfort. The most refined enrichments, the most delicate carvings, which would appear spiritless if seen through a leaden atmosphere, will look well under the brilliant effects of our glowing skies; and the æsthetic merits of Renaissance design, which would in many cases be out of place amid the wind and rain of northern Europe, might be displayed to great advantage in this country of the sun.

One word more, and I shall have done with this portion of my subject. Size and costliness have no more essential connection with art, than the bulk of a man and the balance at his banker's have with his birth and breeding. Size is an accident, and taste costs nothing. Profusion of elaborate ornament, of course, cannot be had without a corresponding profusion of money; but elaborate ornament is not necessary to make a house which every man of taste will feel enjoyment in looking at. So well is this fact now understood, that it is acknowledged by most people that the homes of even the humblest class may and ought to be artistically designed. Hence it is that we now have philanthropists demanding that the house of the poor man should be tasteful, as well as healthful and commodious, on the principle which I have already enunciated to you, that beauty and use go together, and that the prettiest house will be the *best* house in every respect wherein a man can make his home and train his children. "The prettiest house," says the author of the *Moral Influences of the Dwelling*, "will be the healthiest, the most convenient, and the most comfortable; and I am persuaded that great moral results follow from people's houses being pretty as well as healthy."

When the house is built, the next manufactures that challenge our attention are those which clothe the naked walls, the hard floors, and the bare ceilings; and here, again, art comes to our aid, and tells us how this is best done. With regard to the walls, if pictures are to be hung upon them, the truest principles of art dictate that the real mural decoration should be subdued in tone and simple in pattern—that is, the ornament should be

drawn in pure outline, and filled in with flat colour, and all appearance of relief should be strictly avoided. It will be necessary, moreover, that its general tone should give force and value to the objects in the room. Stencil-painting, which is much in vogue on the continent of Europe, is very suitable in this case, and a wall so decorated has an air of coolness which should be grateful in a climate such as ours.

Where pictures are not used, the mural ornament becomes more important. The eye rests in this case upon the wall alone, and demands for its gratification a greater play of line, and even, in some cases, roundness and effect of light and shade, for which, whatever Sir Charles Eastlake and Mr. Owen Jones may say, we have the authority of some of the greatest artists that ever lived. In this case, embossed papers, which appear like relievo leather-work, and have all the beauty of the old Moorish wall enrichments, are much to be commended; but what seems most agreeable to our climate, and what in reality is most artistic, is the adornment by frescoes. If we cannot have such works as those with which Bernardo Luini and the other great *frescanti* decorated the Branaacci Chapel, we may at least have the walls and ceilings of our humblest homes decorated as most Italian country houses are, with arabesques of various colours, painted in distemper—a simple and inexpensive kind of embellishment, that would render the rooms clean and light, and would, if the surface were smooth and polished, last literally for ages.

While on this subject, I may mention that it was once customary in Italy to decorate the exteriors of buildings as well as the interiors. In the days of Italian splendour and greatness, when her merchants were princes and her cities were thronged with gay cavaliers and noble ladies clad in the rich and picturesque costume of the cinquecento, you might have seen in Venice the facade of the Casa Martello covered with the beautiful work of Tintoret, the Palazzo Bolani decorated exteriorly by the pencil of Paul Veronese, and the Casa d'Oro attracting the eye of every passing gondolier by the graceful forms, the high thoughts, the captivating effects of colour, which Vesentini had lavished thereon. Or you might have admired, about the same period, as you passed through the streets of Cremona, the paintings of Campi and many more on the fronts of the leading houses; and in Brescia you would be charmed almost wherever you turned with the splendid decoration of Lattanzio Gambara, and a host of other distinguished artists. Suitable as such decoration would be in Melbourne, it is not too much to say that not one amongst us will live to see our streets adorned in a similar manner. We have neither the artists amongst us, nor the wealthy men of taste, from whom such things might be expected. But it is well, nevertheless, that we should be reminded from time to time of what has been done in other countries, that we may not be too easily satisfied with the humble efforts in the direction of art and art encouragement which we are making in Victoria, or which for many a year it may be possible for us to make.

Of tapestry as a wall-covering I need not say much. It has a highly rich and picturesque effect, but the costliness of all good fabrics of this description will perhaps for ever confine them to the narrow limits of palaces and churches. In most countries the introduction of paperhangings led to the decline of the manufacture of tapestry; but before that time it was a source of wealth and reputation in many states of Europe. The Gauls, with their quick artistic temperament, seem to have excelled in this manufacture even in the time of the Romans, when the red fabrics of Arras had already acquired a certain renown. In the tenth century we know that the monks of Saumur wove hangings decorated with flowers and animals; and about the same time we read of one of the Counts of Poitiers offering Robert, King of France, for his assistance in an expedition, a sum of money and a hundred pieces of the tapestry, for which Poitiers was then celebrated. Later on we find Francis I. making tapestry a state manufacture, and Primaticcio furnishing the designs. Henry II. and Henry IV. set up new establishments, and Philibert Delorme and Jean Gobelin are names that have become illustrious under the patronage of the French crown. During this time Italy and Flanders had become equally famous for their tapestries; in Flanders particularly the productions of this kind were of wonderful beauty and perfection. Oudenarde, Brussels, and Arras, will be for ever celebrated in the history of this manufacture. Among the ancient glories of which Arras still preserves a proud remembrance, are a series of tapestries which Robert of Flanders gave to Bajazet as a portion of the ransom for his son, and the ten pieces worked from the designs of Raphael, as a present from the French King to Leo X. In the 15th century the manufacture declined in Italy, and the last piece of Flemish tapestry was made at Brussels in 1781. France alone, of all nations, continues to be renowned for its hangings. The grand design, the perfect execution, the exquisite beauty of the great works of art, which have been produced by the Gobelins manufactory in modern times, are too well known to require any commendation from me.

The list of methods in which art is used in mural decoration would be incomplete without some mention of the sumptuous mosaics which adorn the ancient churches of Italy with their variegated hues and crystalline brilliancy, which repeat the magic of Raphael and Dominichino in St. Peter's, and which for nearly a thousand years—from the fourth century to the revival of tempera—was almost the only sort of wail embellishment employed. Well might Ghirlandajo say that this is the only painting for eternity. There are mosaics in and near Rome of the fourth or fifth century—as that of St. Constanza, which is of the fourth—in almost perfect preservation; and those of the sixth century, in the church of San Vitale, at Ravenna, are as fresh as they were

thirteen hundred years ago. In the famous studio of the Vatican this beautiful art is in our day carried to a perfection unknown to the ancients. The number of enamels of different tints and hues preserved there amounts to no less than 10,000, and many of the large copies in St. Peter's have occupied from twelve to twenty years in their execution. The Florentine mosaics are also famous. The work of this kind, with which the walls of the chapel of the Medici at Florence are so lavishly decorated, is composed of such costly materials as agates, jaspers, lapis lazuli, and the like. In Venice, glass mosaics are made, specimens of which are now to be found in many of the public structures in England, where they are much admired for the old hereditary art, of which even the hated power of the *Tedeschi* never wholly robbed the "Bride of the Sea."

Turning from the walls and ceiling to the floor, it will be found that mosaics are quite as beautiful and useful here as in the more exalted positions. The antiquity of this mode of floor-decoration, and its common use in ancient times, cannot be doubted, for we read of it in the Book of Esther; and we know that not only Cicero had pavements of this kind placed in all the porticos of his house, but wherever the Roman eagles flew from Britain to Mount Atlas, mosaics followed as an almost indispensable adjunct of the civilisation of the conqueror. Glass tessclation prevailed all over Italy for many centuries. Tesselated marble work, usually of porphyry and serpentine, was used for church purposes for a still longer period, and some of these, as that in the Duomo of Sienna, are large and elaborate compositions in light, half-tint, and shadow.

Another floor-decoration, wherein there is wide scope for art, is that known as parquetry, in which various coloured woods are arranged in geometrical patterns, as may be seen in many of the good old houses in France. This method has been lately adopted in England, and, for many reasons, it is to be hoped that it will one day become common in this country also, where, in the warm, dusty months of summer, it would be so decided a luxury.

For the hall-floor a new branch of manufacture has also been lately started in England. I refer to the cheap and durable, and at the same time beautiful, decoration by encaustic tiles. The happy alliance of art with the resources at the command of the modern workman have enabled the Messrs. Minton to produce tiles as beautiful as those of the ancient Romans, and very little more expensive than common stone pavement.

The use of carpets, which I have purposely reserved for the last, brings me at once to the consideration of textile fabrics, in which a wide field for art display opens up to us, but one which I must run over hurriedly if I would not exhaust the patience with which you have hitherto been good enough to follow me. In touching even thus lightly, however, on the beautiful productions in this branch of manufacture, we must separate well in our minds the two classes into which it is divided by its ministration—in the one case to personal adornment, and in the other to household use. Everything, from the simplest calico print to the richest damask, if used for furniture, is governed by laws of taste entirely different from those which obtain in the whole range of fabrics intended for dress. Different, however, as are these two classes, for the true and grand traditions of art in both we must place ourselves humbly at the feet of the same teachers—the famous art-workmen of the East. In their sunny regions the sense of beauty seems never to have been wanting, whatever department of manufacture they have occupied themselves with. We have engravings, published in 1750, of vases which were then to be found in the museum of the Emperor Khian Loung, and which for beauty of form and grandeur of decoration cannot be surpassed, and yet these vases belong to an epoch 1800 or 2000 years before Christ, when the Greeks had not even yet been heard of. Who does not know the fame of the jewels of Lahore, the ivory and porcelain of China, the arms of Kurdistan, the lacquer-work of Satzouma, the bronzes and papers of Japan, and (what is more to our present purpose) the damask and velvet of Aleppo and Chiraz, the gauzes and muslins of Gwalior and Agra, the carpets of Smyrna, the satins and nankins of the celestial empire, and that unrivalled production the cashmere shawl, which comes from the valley whose "roses are brightest that earth ever gave"? And yet it is a fact that the stuffs of Babylon and Memphis, of Tyre and Alexandria, of Byzantium and Trebizond, are as beautiful to-day as those which are still manufactured according to the same traditions in Constantinople or Broussa, in Persia, India, or Pekin. These productions are not only beautiful, but they seem to be everlasting. I do not speak now so much of the tables, coffers, cabinets, etagères, vases, and other similar products of oriental manufacture, on which porcelain, mother-of-pearl, shell and graven ivory are encrusted with such marvellous skill, and whose faithful designs and irreproachable harmonies endure for ever as testimonies of the fine and unerring taste of the artist-workmen of these countries. Even those more perishable fabrics, which amongst us "outer barbarians" so soon lose their brilliancy and beauty, partake in the East of the durability which seems to belong to all Eastern work. In Persia, when summer comes, the marvellous carpets are taken up and placed for a fortnight in the bottom of a river, from which they re-appear more brilliant than ever; and it is well known that many of them are to be seen in that country, which after three or four hundred years' use are as fresh now as when they were first made. France, too, it must be admitted, has held for centuries a high position in carpet manufacture. The magnificent products of the Gobelins, the Savonnerie, and Aubusson, are works worthy of the homes of kings. The carpets of the Gobelins manufactory, in addition to their artistic value, have, like Eastern work, the priceless quality of everlasting solidity. Friction and wear only increase their durability, as

they have the effect of drawing closer the knots which fasten the wool to the warp. The Savonnerie carpets are the largest made. They are generally white, with arabesque borders, in which the delicacy of the dyes, the harmony of the colours, and the skilfulness of the workmanship, defy all western competition. At Aubusson, it is well known, the principles of the art and the aptitude for execution are traditions in certain families, and no other place can produce such a staff of workmen. It is worthy of remark, however, that even there, where the apprentice is accustomed from infancy to handle his father's frame, it takes fifteen years to qualify for the work.

The teachings of art with regard to this manufacture are, perhaps, clearer than in reference to mural decorations. Whatever we may think of relief and natural ornament upon the walls and ceiling, I think we can hardly help admitting that flatness is a most wholesome feature in floors. It is uncomfortable to walk over hill and water in a landscape, to trample on living creatures, and to feel in constant danger of being tripped by some other formidable reality; and hence, however excellent these things may be when taken separately, there can be little doubt but that they are bad and false as floor decorations. Floral designs are the only imitations of natural objects that may be properly introduced, and whatever Mr. Wallis and other authorities may say of the want of knowledge of those who admire flowers in carpets, I cannot but think that they are perfectly suitable, and that their effect is artistic in a very high degree. If this be an error, I am quite satisfied in this respect, at least, to err with Mr. Ruskin, who says he "cannot see, since the first thing we usually do to make the ground fit to be walked upon by any festive procession is always to strew flowers upon it, why we should refuse to have flowers on our carpets."

Other textile articles of furniture, such as window curtains and, in a still greater degree, table linen, should be exceedingly simple in pattern, as it is obvious that the use in one case, and the folds in the other, preclude the possibility of all elaborate ornamentation, which would be distorted on the window and incongruous on the napkin.

And now I approach those manufactures in which art is employed to heighten their power of personal adornment and make them harmonise with the character of the figure which they array. In some respects it is a delicate subject, because I am afraid I can hardly touch it without "fluttering the dovecots of Corioli," displeasing the ladies as well as the fashionmongers, who are their oracles of taste. In this free country, and in free England, our ladies enjoy an almost unlimited liberty in dress as well as in other things. They are restricted neither to the mantilla of "Spain's dark-glancing daughters," nor to the veils and shawls of their Turkish sisters. They dress, in fact, according to their own sweet will, and the use they make of their liberty is to attire themselves all alike in whatever extraordinary costume the last fashion-plates from Europe may introduce. Sometimes the gowns of our wives and sisters are abbreviated petticoats, in which Venuses that may be said to be of the Doric order of architecture are seen to great disadvantage. Sometimes they are lengthened out to an inordinate degree, and a train that would be becoming only in a drawingroom is dragged through the dust of Collins-street, to the infinite inconvenience of the male frequenters of that Rialto of fashion. Sometimes, again, our ladies' dresses are straight and bare as a friar's frock, and anon they are monstrous in their amplitude, and over-abounding in paniers and puffs. As long as the hair is of the new colour, the dress of the style worn two months ago in London, the hat of the latest bandit or gipsy shape, and the ribbons and jewellery in strict accordance with the prevailing mode, they think they have done all that can be required of them by the most exacting critic.

I wish I could place before you some work of Holbein's or of Paul Veronese's—it would teach you more in five minutes of the uses of art in the manufacture of garment materials than I could tell you in hours. Nothing can be nobler than their robe embroideries. The magnificence of colour, the subtle beauty of design, the harmony of texture and ornament, and the due subordination of all to the prominence of which the figure should never be deprived, are really marvellous to behold. In a general way, however, I may tell you that art requires brocade and such costly material to have a rich treatment, while the pattern on muslin bareges and cotton should be small, and founded on a regular and severe basis. A few more general principles are that the closer the fabric the smaller must be the pattern, that in woollen goods it should closely cover the ground, and that all patterns which cross the fabric so that they run round the dress when made up should be avoided.

Closely connected with textile fabrics, in their double office of household utility and personal decoration, are the manufactures in which the materials are the precious metals and the precious stones. Artists have at all times loved to lavish their labour upon these costly substances, not indeed because of their money value, which is a matter quite unimportant from a purely artistic point of view, but rather for their durability, a quality which every true artist prizes highly on account of the immortality it promises to his work and to his thoughts. The greatest monuments of stone and brass that human genius has produced are long ago lost in the waves of time, but the indestructible gold and the ever-flashing jewel discovered to-day in an Egyptian sepulchre are as perfect as when they were first placed there. Indeed, if gems and golden ornaments had no artistic beauty, but were in the one case badly cut or inappropriately used, and in the other monstrously designed, then indeed we might say with Ruskin that such things were fit only for "the adornments of the chariot and the trappings of the steed." Art

it is that gives them their highest value, and makes them fit to take their place on the brow of beauty or on the sceptre of a king. Gems might have been hollowed into cups for the banqueting-hall of Cleopatra; but if they were made the vehicles of no high thought, if no beautiful art was entrusted to their everlasting keeping, then they were fit for nothing better than to hold some costly wine to the lips of a drunken Cæsar. In this, as in every other branch of art-manufacture, the French are by general consent allowed to be pre-eminent for grace and novelty of design, for vivacity of fancy, and for scholarly and well-selected reproductions. The English, while inferior in these respects, have, however, of late years made wonderful progress, and their work, if not quite so rich in art qualities, has ever had a solidity of structure and an excellence of execution which are by no means undeserving of high praise. It is said that a certain Austrian nobleman never danced without shaking off several hundred pounds value from his diamond ornaments. This I can perfectly understand might happen if the settings were French, but would hardly ever occur, I think, if they were English. The problem which the jeweller has to solve is to unite, as far as possible, the delicacy and beauty of French work to the soundness for which that of our own countrymen is distinguished. In this, as in all other branches of art, we must go back to the concurrent testimony of past ages for the principles of taste by which they are to be guided. It is, therefore, much to be regretted that we have no specimens of ancient jewellery, or even clever reproductions of well-chosen models, to which the student could be directed for instruction or suggestion. If we cannot have a Campana museum, such as was added some time ago to the Louvre; or a priceless collection, such as may be found amongst the treasures of the Hotel Cluny; or examples of the fine historical jewellery of the Italian peasants, such as were lately purchased from Salviato of Rome for the South Kensington Museum—it might be worth the attention of the trustees of this institution to procure some electrotype reproductions or some photographs of the best work of the kind of various epochs, and even to make a beginning of collecting such originals as opportunity and their resources might place within their reach. This would soon rid us of the wretched design and inappropriate ornament with which one is so often shocked in the personal jewellery we notice as we walk through the principal thoroughfares of this city, and which are so different from what would meet the eye on the Pincian in Rome, in the Champs Elysées in Paris, or even in "the Row" in London.

A wide distinction there is between those works in the precious metals which are intended for personal adornment and those designed for use as well as beauty. "In the one case fancy may be indulged," says a popular writer on the subject, "to almost any extent, in the other the utility of the object will govern its form." This beauty of fitness, or truth of construction, rejects every ornament inconsistent with it as a senseless and unjustifiable extravagance. If art, however, be more restricted with regard to form in gold and silver objects of use than in those of mere ornament, it must not be thought that the artist does not find as congenial a field for his labour on the noble service of plate made to be a family heirloom, as on the parure destined for a royal bride. Some of the most potent wizards of the pencil or the chisel have produced designs for silver work, Perugino, Raphael, Michael Angelo, and Giulio Romano amongst the number; and one man's name (need I say it is Benevenuto Cellini's?) has become immortal by its connection with this work alone. Once the contour is fixed, the enrichments, whatever they are, should grow naturally out of it, or should help to make it, but should certainly never be allowed to disturb it in the slightest degree. In these limits, however, much rich and worthy artwork may be produced. I must say that in this direction I have seen some efforts of our Melbourne silversmiths that could not be described otherwise than as highly meritorious. Presentation plate has sometimes appeared in the windows of one or two of them, which certainly spoke well for the taste of the designers, and their sense of appropriate ornamentation. A want of originality no doubt may be noticed, for the types of the aboriginal, the goat, and the kangaroo, have become almost as fixed as those of man and animal were in the art of the Assyrians; and beyond a fortuitous meeting of these various creatures, with the addition or substitution of an emu or some other specimen of our living curiosities, I am afraid that the invention of our local workers in silver very rarely goes. Works of this kind, more than perhaps any other, should in their entirety convey a thought which every individual ornament would help more clearly to bring out. The thought should meet the eye distinctly and at once, impressed on the whole design, and on every part of it; and even the treatment—large, generous, and free—should aid in giving a sort of frankness and sincerity to its impression.

Talking of personal and house ornamentation, I can hardly avoid saying a word about lace—that delicate and most artistic fabric, which adds such an air of elegance and brightness to the household, and aids so gracefully in enhancing the charms of female beauty. Its classic home is Belgium, but France has long been a powerful rival to that country, and Honiton and Limerick are surely not unknown to fame. Its manufacture has always proved a source of national wealth in Belgium, but it is now more flourishing than in the most palmy days of the Netherlands. Lace-making forms a branch of the public education, and employs, it is said, one-fortieth of the population. This in itself is a proof of the utility of art in manufactures, for it is not only to its fineness, but to its beauty, that Belgian lace owes its world-wide renown. Brussels lace is unrivalled for its artistic treatment, as well as for its delicacy; and the elaborate and tasteful workmanship of Valenciennes is as well known as its solidity, which gained for it the name of "*eternelles Valenciennes*." In France the most

celebrated centres of this beautiful art-manufacture are Alencon, Normandy, Auvergne, Lille, and Arras. The point d' Alencon is the most costly of all kinds of lace. It is the splendid fabric of which were composed the cuffs, and garters, and shoe-roses, and falling collars, of the magnificent court of Louis XV., and of which such matchless specimens appeared in the *corbeille de mariage* of the Empress Eugenie. The curtains and bed-trimmings of the cradle presented by the city of Paris to the infant son of Napoleon III. were of this material, and cost nearly £5000. To such value may materials of the cheapest kind be raised by the happy combination of artistic and manual skill.

The uses of art in the making of furniture is a subject which itself alone would require, not one lecture, but a course of lectures to do it justice. One of the first good effects which art-teaching would have upon this manufacture would be to banish for ever many of those forms with which we are so familiar, and in which the greatest amount of ugliness is united to the least possible amount of comfort; to make short work of all those gaudy inflations and pretentious devices which give our modern house-interiors such a shoppy and snobby appearance, and to give our furniture correctness of structural design and appropriateness of ornament, instead of the meaningless imitations, the lawless luxuriance and extravagant caprices which vulgar ostentation has of late years called into existence. "Beauty," says Sir Gardner Wilkinson, "is not to be obtained by capricious ornament such as overloads so many of our modern productions, for unless the maker knows why the particular form and all the ornamental accessories are given to his work, any splendour of decoration which may merely delight the ignorant will only be looked upon by men of good judgment with the greatest dissatisfaction." This is not to say, however, that house furniture should be deprived of all magnificence of ornament. The choicest woods (and any one who passes through our Technological Museum will see what a splendid variety we in this country have to choose from), coloured stones, bronze, ormolu, and Florentine mosaics, may all be used to give imperial opulence to the drawingrooms of the wealthy, if only they are used in accordance with the dictates of good taste. Tarsia, and other sorts of marquetry, may take their place in homes where economy is studied. But in all good art-workmanship of this kind, whatever be the materials employed, there should be cleverness of design, happy blending of colour, purpose in the placing of each detail, and intent in every touch. With these the result is sure to be satisfactory, whether you use ivory inlays to enliven the sober tones of walnut, and focus the colour in masses of agate and lapis lazuli, or search for polychromatic variety and concord in the juxtaposition of ebony, gold, porcelain, satin-wood, and silvery sycamore. Carving is, however, the most legitimate and appropriate of all means of ornamenting furniture. The display of fancy and the *finesse* of execution for which there is here so wide a field, is the decoration which a man of taste will prefer to all others. Those who would wish to see in what manner artistic carving may be made to heighten the beauty and consequently the value of household furniture, cannot do better than examine attentively the magnificent Italian chimney-piece, of which we have a copy in our Art Gallery. This noble work of art-manufacture, which formerly belonged to the Counts Petinelli, at Padua, and is supposed to be the production of one of the Lombardi family, who sojourned in that city towards the beginning of the sixteenth century, was purchased in Italy by M. Soulages, for his valuable museum, which is now the property of the English nation. Amid all its rich profusion of ornament—its baluster-shaped shafts unsparingly decorated, its projecting corbels representing marine divinities, its carved mouldings on cornice and entablature, and its figures in full relief upon the frieze—the most perfect harmony of details, and the completest unity of character, as well as the utmost skill and the highest finish, are stamped upon the entire work. Such an example as this will do more than a hundred lectures could do to spread correct notions of the relation between art and handicraft.

And now I must hurry on. The only remaining branches of art-manufacture on which I can touch this evening may be all comprised, in a loose way, under the head of furniture. They are the manufacture of glass, of bronze, of ironware, of porcelain, and pottery.

The glory of glassware might, until very lately, have been said to belong to a past age. No doubt our flint-glass, owing to the use of lead in its composition, is of a much more crystalline purity than was ever dreamed of by Venetian artists; but, unhappily, this very ingredient precludes nearly all possibility of artistic treatment. The material cools so quickly during manufacture, that no time is left for the display of skilful handiwork or delicate taste. Hence it is that, up to a very recent date, the quaint and elegant forms, the graceful and fantastic ornament, the dainty touches of colour, the mellow and jewel-like effect, which were common to the glass manufactures of Venice in the fifteenth century, were unknown amongst us, outside the curiosity shops where the rare specimens still preserved were sold at ten times their original cost. Neatness indeed we had, and brightness, mathematical precision, and sometimes even nice engraving, but the countless colours and forms of old filagree were gone, and the rich golden lustre of *avventurino* was no more. To an Italian gentleman of our own time—a scholar and a lover of art—is due the honour of having resuscitated this beautiful industry; and now the glass-workers of Murano, amongst whom the traditions of the lost art had never been entirely forgotten, produce works which will bear comparison with the best productions of former times. Bohemian glass is one which alone never forfeited its reputation, but it must be admitted that until within the last few

years its decorations in gold left much to be desired. The green glass of Bohemia is now, however, not only superb in tone and quality of colour, but the contrast with the raised gold is of the most charming and artistic effect. French glass is elegant and correct in taste, like all other art manufactures of that country; and French chandeliers are remarked for a greater perfection of cutting for the purposes of illumination than is generally to be found in similar articles elsewhere. English glass has lately improved considerably in design. We no longer use the inverted cones, from which our grandfathers drank their "fine old tawny," and champagne sparkles now in a broad tazza of elegant shape, instead of being confined in the long narrow glasses which many of us may remember. Water-bottles, claret-jugs, salt-cellars, preserve-jars, flower-stands, vases, all display more refinement than the articles did some fifty years ago, and their value has proportionately risen in the markets of the world.

Glass-painting and glass-staining are branches of art-industry quite different from one another, and the latter, of course, quite distinct from the manufacture of articles in glass. In stained glass the colouring is not superficial, but pervades the substance of the glass, and is obtained by mixing metallic oxides with the glass in a state of fusion. Of these industries however, I need not speak, as art is obviously necessary wherever colour is employed, and glass-painting, in which Lorenzo Ghiberti, Claude, and Bernard Palissy distinguished themselves, though purely a monumental decoration, approaches so nearly to fine art that its highest merits must be always of an æsthetic nature. A pure and correct style of drawing without any elaboration of detail, and a simple and vigorous rendering of the subject, are the qualities which the painter in glass must before all things endeavour to attain. At a distance the colours and forms should make a harmonious whole, and only on closer inspection should the elements of the general effect be perceived. This is a secret of decoration that has not hitherto been much noticed, but it is nevertheless of the very utmost importance, as I believe that in it lies the solution of many of the difficulties about which ornamentalists are so divided. Good decoration of this kind, proving really pure and true when examined, and yet unobtrusive of form and detail when looked at as merely part of the building it adorns, should, I think, satisfy the followers of nature as well as the orthodox disciples of the conventional school.

The art-industry of decorative bronzes is another of those branches of my subject of which I need say but little. The successful manner in which art has been applied to it in France is a source of immense wealth to that country. And "this success," says a writer on the subject, "is based on the special preparation and education of the workers. . . . Thus, competitors with France must commence, not with the foundry and the workshop, but with the school of art, and gradually train the student in designing and modelling for metal-work, or educate the young worker in the class-room. In no other way can the skill which exists in the extensive *ateliers* of the bronze manufacturers of Paris be emulated, still less rivalled." The fact that our climate is highly favourable to the display of this material should be an inducement to Australian artists to turn their attention to bronze decoration. Its exquisite and varied tones are imperceptible in a scanty, diffused light, but are brought out in all their sombre and harmonious beauty under the brilliancy and the consequently sharply-defined shadows of an atmosphere so pure and sunny as this of ours.

From bronze to iron is not an abrupt transition. There is scarcely any material which affords wider scope for art than iron, by reason of the ductile and tenacious qualities which it possesses in so eminent a degree. Hence it is that no branch of trade shows more variety of design than that of the ironmonger. Those who have travelled in Italy will know with what consummate art it has been beaten and dragged into delicate lines, and fair forms, and fantastic imagery, by the old workers of the quattrocento and succeeding century. The town of Siena, the streets of Florence, the garden walls of Brescia, the balconies of Bellinzona, are rich with the freedom and fineness of this ancient art, here rising in sprays of foliage, there twined in capricious tendrils; here falling in tassels, there clustering in wreathed flowers. Two of the little Alpine towns have, to use the words of Ruskin, "complete schools of ironwork in their balconies and vineyard gates." Copies of this work should be constantly before the eyes of those who would learn the use of art in this branch of manufacture, and I know of no fairer examples than the gates of Ghiberti, of which I have had a few of the panels brought here from the School of Design for your inspection. Angelo said they were fit to be the gates of Paradise, and after that they require no further praise. Another very extraordinary specimen of ironwork is that shield in *repousse*, representing the Apotheosis of Rome, with which visitors to the National Gallery must be familiar, and which is the work of George Sigman, one of the famous old goldsmiths of the imperial city of Augsburg. The influence of such examples would soon rid us of the lacquered ugliness of Birmingham patterns of stoves and fenders, candelabra and coffee urns, which are remarkable for nothing so much as for their meretricious extravagance of style, and we might once more expect to see even fire-dogs made beautiful with art, as they were in the time of Shakespeare—

"——the roof o' the chamber
With golden cherubims is fretted; her andirons
(I had forgot them) were two winking cupids,
Of silver each, on one foot standing nicely,
Depending on their brands."

And now we reach the last branch of manufacture of which I propose to speak, that most ancient and most artistic one which is described under the generic name of ceramic ware. Made of the most worthless of all materials, some of the triumphs of this industry have become, by the power of art, things of inestimable value. Looking through the Sèvres manufactory, as I have often done, and admiring the soft and brilliant colouring, the glowing landscapes, the gay figure subjects, the pictures of the Boucher and Watteau class, the shepherds and shepherdesses in satin, the noblesse of past centuries, the powdered gentilhommes and high-heeled dames of the court of Louis Quatorze, and the rest of the brilliant pictorial display which there meets the eye, one may well fancy himself in a gallery of paintings, and be disposed to claim for ceramic decoration the dignity of fine art in its highest and most exclusive sense. Pictures I have seen there of which Meissonier might have been proud; flowers worthy of the old Dutch painters; colours such as the *bleu de roi* and the *rose Dubarry*, unrivalled for their delicacy of tint; and works which, both for their constructive and ornamental art, were precious beyond their weight in jewels or in gold. Those who are acquainted with the manufactories of Dresden and Berlin also know something of what art can do for porcelain; and whoever has visited the Marquis Ginori's establishment in Florence will treasure the sights he has seen there among the most beautiful reminiscences of his Italian travels. It is well, however, to remark that the Dresden ware, of which we have some examples in the Technological Museum, is by no means the perfection of fictile art. The first European manufactory of porcelain was established at Meissen, near Dresden, but the art of the Saxon capital even in that period, which courtiers used to call its Augustan age, was ever false and extravagant in character. Rococo is the style to which it owes its architectural physiognomy, the statues in its public places are too often those of the German disciples of Bernini, and the paintings with which Heinecken once inundated the state collection are certainly not adapted to elevate the public taste. It is not therefore astonishing if, under such influences, the Government porcelain works produce nothing better than delicate toys in which real æsthetic merit is rarely present. The reproductions on porcelain of four celebrated pictures, which may be seen in the Technological Museum, and which are also of Saxon manufacture, are, however, works of very considerable interest. Considering the many difficulties which attend the process, it must be admitted that they are highly successful. Each of these productions is painted at least three times over, and the colours burned in after each painting, so that not only the very nicest accuracy is needed in allowing for the action of fire upon the pigments, but the most anxious care lest accidents should occur. Notwithstanding all the skill and attention of those who are long accustomed to the work, the colours often turn out unsatisfactory, and frequently twenty plates are destroyed before one comes forth unscathed from the ordeal. These difficulties will of themselves prevent this mode of reproduction from ever becoming popular, but successful specimens (such as we now see before us) are worthy of attention as examples of the higher capabilities of ceramic art. British factories have produced pottery and porcelain decidedly superior to this Dresden ware, and ever since the days of Wedgwood this industry has been stamped with a beauty and excellence which even in France and Italy is rarely surpassed. No European establishment has yet discovered the secret of the great era of Chinese porcelain, notwithstanding all the chemical knowledge and the artistic resources of our time; but it is satisfactory to us to know that English artisans have produced works which so closely imitate the *dolce color d'oriental zaffiro*, and all the other characteristics which are associated with the dynasties most renowned in celestial ceramics, that even judges are sometimes deceived. As a proof of this, I may relate an anecdote which I have from excellent authority. Not long ago the warehouse of Mr. Hewett, of King William-street, was visited by some gentlemen learned in pottery, one of whom was celebrated as a liberal and enthusiastic collector. They examined some china of a watery-blue pattern. Suddenly one of the authorities, as if struck with some idea of peculiar importance, drew forth a magnifying-glass and applied it almost tremblingly to the lower part of the plate. A moment was enough. "Ha!" said he, "I thought so—Ming dynasty." The proprietor wisely was silent in the presence of his customers, but as soon as they were gone his first words to a friend who witnessed the scene were—"Ming dynasty! It was made by workmen last year."

I cannot tax your patience any further. There are, of course, many other branches of manufacture of which I might speak, but those which I have mentioned will suffice to give you some notion of the wide and splendid field for human industry and the immense sources of wealth that are opened up by an intelligent union of art and design with the labour of the hand. The value of art-power in the workman is now, however, daily growing

throughout the world to be not only appreciated, but absolutely required. Even in England, which was so long a time behind some of the other countries of Europe in this respect, ugly, inartistic designs will not sell at present, and the articles of French manufacture which command the market do so for no other reason than because of their superior beauty. No money or pains are spared to raise the English workman in the scale of artificers, and to place him on a level with his fellow-toilers in other lands. Last year, in addition to the large sums voted to galleries and other institutions connected with art, £34,000 was spent in schools in which art instruction is given to the working classes, and these schools were attended by 18,690 students in the day, and 7258 at night. Exhibitions are made to aid also in the good work. Besides the South Kensington Museum, which is permanent, not a year passes without displays of art-manufacture for the education of workmen; and last May was opened the first of a series of International Exhibitions in London, which are henceforth to be held annually, and in which an immense field of study is opened to the designer for industrial purposes. In this great movement which is now spreading over the whole earth, it is absolutely necessary that we should take our place. If we do not, the time will come when Victoria, which should be the great manufacturing centre of these southern lands, will have to import perhaps from some neighbouring colony many of the articles used by her own people. Far from us such a disgrace! Shall we not hope rather that the day may come when, in this land of wealth and liberty, as in the free republics of Venice, Pisa, and Florence, and amongst the commercial communities of the Rhine, art may flourish in all the grandeur of creative power, and our workmen may rival the Tafis, the Ghibertis, and the Palissys of old? But, if we wish for such a future, the attention of the working classes must be aroused to the importance of art-instruction. If these words bear the fruit that they should, art-education for the people will henceforth be dealt with in a more thoughtful and liberal manner than in the past, and our manufactures will be amply and worthily represented at the exhibitions held in London every year. Instruction—Rivalry; these are the two souls with which our workmen are to be animated, and the task of doing so is worthy of the noblest minds amongst us. On it depends, in no small degree, the future greatness and prosperity of the new empire which it has fallen to us to found, for we must ever remember that, on these southern shores, which were first pressed by the foot of civilised man within the memory of most of us—

"We are ancients of the earth
And in the morning of the times."

Painting and Painters.

A Lecture, DELIVERED BY THE HON. Thomas Turner A'Beckett, M.L.C.,
On 12th October, 1871.

IT will easily be understood that all the details of so large a subject as that of painting and painters cannot be brought within the limits of a single lecture. I shall not attempt more than the sketching a series of outlines, which those who are disposed to do so may fill up at their leisure, with more or less finish, from the abundant materials for such a work which may be found within the walls of the institution of which this lecture-room forms a part.

Painting does not rise to the dignity of art until employed in the production of what we all call a picture. In this form it is accepted as the symbol of art itself. All who practise an art are entitled to be ranked as artists, but we do not give this designation in its general sense to any but painters; the followers of other arts must have the art particularised with which they are specially associated in order to fix their position in the artist world. Millions derive enjoyment in a higher or lower degree from the results of pictorial skill, who would be insensible to the charms of art exhibited under any other form; and we cannot but recognise the fact that painting has contributed to the mental gratification of the human race, through the medium of the senses, in a much larger degree than any other art which has been practised by mankind.

Before entering upon the main subject of my lecture, I will occupy a few moments in giving a short description of the principal kinds of painting with which we are acquainted, or of which we have any record. The earliest method of painting known to have been practised was in use long before the Christian era, and is still resorted to as being, under certain special conditions, the most effective that can be employed. It is called "fresco," the term fresco—a word which signifies "fresh"—having been applied to it in Italy, where the art of painting in fresco has long been, and still is, very extensively exercised. It is a kind of painting that can only be successfully executed by very skilful artists, as the work must be carried on with great rapidity, and will not admit of correction while in progress. The groundwork of the picture is plaster, prepared with the utmost care, and with the greatest attention to the selection of the ingredients employed in its composition, and this plaster is

kept in a moist or damp condition until the picture is painted into it with water-colours. The effect, under skilful treatment, is satisfactory in the highest degree. The colours, when the material is well prepared and the picture is properly protected, preserve their first freshness and brilliancy for an almost indefinite period; and the surface being perfectly free from gloss, the painting can be seen advantageously from any point of view. Fresco painting is applied principally to mural embellishment. It is only recently that its value for such a purpose has been fully understood in England, where fresco painting fifty years ago was scarcely ever practised. The finest English specimens of fresco painting are in the Parliament Houses, and the largest in the new hall of Lincoln's Inn, the picture covering an area of 1700 square feet. Splendid specimens of fresco painting may be seen in all parts of Italy, the most exquisite being those at the Vatican, the productions of Raffaelle and Michael Angelo.

The most durable pictures are produced by a process which can only be applied to works of art intended to remain permanently in the place first assigned to them; it is called "mosaic." The picture is formed of very small pieces of coloured glass or stones, so fitted together as to present the appearance of an ordinary painting. Mosaic painting is of the very highest antiquity. Pliny describes, with some minuteness, a picture in mosaic which appears to have had great attractions, and some exquisite specimens of mosaic pictures have been discovered in the remains of Pompeii. This curious art is largely practised at Venice, where it has been in use for many centuries. The pictures that ornament the front of St. Mark's are executed in mosaic, as are almost the whole of those in the interior. The altar-pieces in the various side chapels in St. Peter's, at Rome, are copies in mosaic of celebrated pictures, and are so exquisitely wrought that it would be quite impossible at the distance from which they are seen to perceive that they are not hand-paintings. It is said that every one of these mosaic pictures cost six thousand pounds.

The mode of painting generally practised by the ancients in the production of easel or movable pictures was called "encaustic," from a Greek word signifying "burning in." The colours used were mixed with wax, and when applied to the pictures, were blended into each other by heat. It was practised from the time of Alexander the Great, until about the fourteenth century, when it was superseded by oil painting as now practised. Oil painting was introduced in the year 1410, by one John Van Eyck, a Belgian, and appears to have created an immense sensation among the followers of art, equal, as it is said by some writer, to the discovery of gunpowder about a century earlier. Painting in "distemper" is painting with colour mixed with size or white of an egg instead of oil, and is employed in painting pictures which are to occupy very large surfaces, and which it is necessary for the production of their desired effect should be free from gloss. It can be laid on canvas or other material with very great rapidity, and is always used in scene painting. Painting in water-colours I need not describe.

The preparation of colours has now become a separate calling, and has immensely facilitated the work of the artist, who, not many years ago, had to devote an enormous amount of time to this kind of labour, which was entirely unconnected with artistic skill, but without which no artistic skill, however great, could be made available. You will be able to judge of the extent of this drudgery by the following extract from Cennini's treatise on painting, written in the fourteenth century. In treating upon the manner in which the art of painting pictures should be acquired, he writes thus:—"Know that you cannot learn to paint in less time than that which I shall name to you. In the first place you must study drawing for at least one year; then you must remain with a master at the workshop for the space of six years at least, that you may learn all the parts and members of the art, to grind colours, to boil down glues, to grind plaster, to acquire the practice of laying grounds in pictures, to work in relief, and to smooth the surface, and to gild; afterwards to practise colouring, to adorn with mordants, paint cloth of gold and paint on walls for six more years, drawing without intermission on holy-days and work-days, and by this means you will acquire great experience. If you do otherwise, you will never attain perfection."

In no period of the world's history has pictorial art been more cultivated, more generally practised, or better patronised and rewarded, than at the present day, and it is difficult to imagine that there ever could have been a period of time in past ages, during which the art of painting was unknown, or its efforts unappreciated. It is, however, impossible to ascertain the degree of estimation in which painting was held in the earliest times, and difficult to judge of the degree of perfection to which it had attained at a very distant era.

It is remarkable that there is not a single passage in the Bible to justify the belief that painting, as an imitative art, was followed or esteemed by the Jews. They certainly had a great appreciation of the beauty of colours, and used them freely for the purpose of ornamentation, in their costumes and in their dwellings. Tapestry work seems to have attained to great perfection, and to have been highly valued, if we may hold, in testimony thereof, the song of Deborah, wherein she describes the mother of Sisera as watching impatiently for his return from battle, and saying within herself, "Have they not divided the prey—to Sisera a prey of divers colours, a prey of divers colours of needlework on both sides, meet for the necks of them that take the spoil." There are several passages in the prophetical books showing that painting, with the view to the production of a pleasing effect, was commonly practised, but of notice of any painting, corresponding to pictures such as those

that are now regarded as works of art, there is not a trace. The Jewish people may have considered such a picture a "creation" which would have been an infringement of the letter of the second commandment, and this may have prevented their practising painting as an amusement, or countenancing it as an occupation, although they disobeyed the spirit, as well as the letter of the commandment, in its grosser form of image worship. I am the more inclined to the opinion that they considered imitative painting a breach of the divine injunction, from the fact that in the early ages of Christianity the converted Jews looked upon painting in this light, and destroyed, therefore, many splendid works of art. A letter is preserved, written in the fourth century by the Bishop of Salamis to the Bishop of Jerusalem, in which this passage occurs:—"On my journey through Anablata, a village in Palestine, I found a curtain at the door of the church, on which was painted a figure of Christ or some saint—I forget which. As I saw that it was the image of a man, which is against the command of Scripture, I tore it down and gave it to the church authorities, with the advice to use it as a winding-sheet for the next poor person who might have occasion for one, and bury it."

Although, however, there seems reason to believe that painting was not practised by the Jews, there is no doubt whatever that more than 2000 years ago it had attained a degree of excellence, certainly not much below, and probably equal to, that which exists at the present day. This is proved by the evidence of the historian, by the remains of paintings that have been discovered, and by other works of art which have been preserved to the present time, and which show a correctness of form and a beauty of design and expression which constitute them even now models of grace and beauty, which it is the highest aspiration of the artists of the present day to follow, and if possible surpass.

The highest and best authority we have on the subject of ancient art is Pliny the elder. He was born in the year of our Lord 23, in the reign of Tiberius. Among other works he wrote one on Natural History, in thirty-seven books, which are now extant. In the thirty-fifth of these he wrote largely upon Painting, and he gives an account of art and artists from the earliest period of man's history up to his own time. It is from this book the greater part of the information extant on the subject of ancient art has been obtained. Pliny tells us that in his day the Egyptians asserted that they had been masters of painting for 6000 years, and describes this as "evidently a vain boast." When the Exodus took place, about 1500 years before Christ, the Egyptians were, no doubt, the most civilised people in the world, and Moses, it is said, was "learned in all the wisdom of the Egyptians;" but we find no allusion whatever in the sacred record to the skill of the Egyptians as painters. That they understood colouring there can be no doubt; but although the remains of their paintings, of which we have many in almost every museum, show great brilliancy of colour, they are grossly deficient in imitative power. It was more a kind of picture-writing than painting that the Egyptians practised, as we can perceive by their mummy cases; they had some knowledge of proportion, as is shown by the gigantic figures which are still extant, and which, notwithstanding the vastness of their size, appear to have been executed under a thorough perception of the proportion that the different parts should bear to each other. It is said that the Egyptians did not judge of the proportion of a statue by the eye alone, but that they made a small model which was divided into a number of parts, from which, in the same number of parts in any given proportion, worked by different hands, they executed their colossal statues.

Three classes of paintings have been discovered in Egypt—some on walls, some on mummy-cloths, and some on papyrus rolls. The search for Egyptian antiquities has been a favourite one with explorers. Numerous works, profusely illustrated, have been published as the result. Those which are considered the best are a French work, published by the "Institut du Caire," and one by Rossellini, called *Monumenti dell' Egitto e della Nubia*. In many of the Egyptian tombs and temples, of which the ruins still exist, may be seen wall-paintings, the colours of which appear quite fresh, and form excellent illustrations of the manners and customs of the people. Several of these have been transported to the British Museum, together with mummy cases, and many other relics indicative of the very barbarous state of painting as an imitative art among the Egyptians. There are also in the British Museum, and in several other museums, the brushes, together with the colour boxes and palettes and other implements, used by the Egyptian painters. It is supposed that many of the Nineveh sculptures in the British Museum were the work of Egyptians, introduced by Cambyses into Persia, who formed there an Egyptian colony.

It was in Greece that painting in its highest form appears to have arisen and flourished. It is supposed that the art was there introduced by communication with Egypt, where painting was known long before there is any evidence of the existence of the Greeks as a people. It was not until about 600 years before Christ that a period can be distinctly fixed at which art in Greece began to flourish, and the period of about five centuries before the Christian era may be said to constitute the first age of art. The earliest painter whose name has been recorded is one Bularchus, who painted a picture of a battle about 716 years before Christ, which was so highly appreciated by Candaules, King of Lydia, that he paid for it as much gold coin as was required to cover it. It is evident that 600 years before Christ paintings were numerous, as Herodotus mentions that when Harpagus besieged the town of Phocea, 544 years before Christ, the inhabitants, having collected all their valuables, except paintings

and other works which could not easily be removed, fled with them to the island of Chios. It is clear by this that these paintings were very large, probably fresco paintings, forming mural decorations, which could not be carried away.

The first painter whose name has been handed down to posterity as a master of his art is Polygnotus, who flourished about 450 years before Christ, and is spoken of in very high terms by Aristotle. Several of his pictures are specially alluded to by contemporary writers, and show that he had vivid imagination and great power of expression. It was said of him, that as Homer was the founder of epic poetry, so was Polygnotus the founder of historic painting. I pass over the names of many artists who appear to have followed in the steps of Polygnotus, to dwell a little on the well-known name of Zeuxis, who appears to have advanced into the regions of art greatly beyond the limits reached by Polygnotus. Lucian gives a most interesting description of a splendid picture he had himself seen from the pencil of Zeuxis, which I cannot venture to transcribe, knowing how much I have to compress within the limits of this lecture. Like some of the pictures by the popular artists of the present day, one of the pictures of Zeuxis was publicly exhibited, and brought the artist a large sum of money, people flocking to see it from distant parts. Zeuxis was succeeded by a line of artists of very high reputation, whose works are dwelt upon at considerable length by writers who had seen their productions, and from the description given of them, many of these must have been wonderful conceptions, worked out with great ability. Some of them appear to have been sold for enormous prices. A sum equal to £4000 of our money is stated to have been given to a painter named Aristides for a battle-piece, which was afterwards resold for a sum equal to £6000. We could imagine ourselves reading an account of the pictures of our own time, when perusing the description given of the pictures of very ancient days; and the incidents connected with the picture-dealing that evidently went on in the time of Pliny bear a great resemblance to those of the present period. We are told of a picture of this Aristides, which had been taken to Rome, being utterly destroyed by a picture-restorer; a fate that has befallen many of the finest works of the more modern artists, under the hands of the so-called picture-restorers of our own time.

You have all heard of Apelles. His name is accepted as the representative of art of the very highest character. His world-wide reputation is due very much to Pliny, who appears to have placed him above all other painters, though his claim to the pre-eminence is not acknowledged by contemporaneous writers. He flourished in the time of Alexander the Great, by whom he was largely patronised, a circumstance which may have contributed somewhat to the impressing his name so deeply as it now appears in the records of fame. He painted the Emperor's portrait several times, and for a large picture, in which the Emperor was very prominently introduced, he was paid twenty talents of gold, equal to more than £50,000 of our money. At the time of Apelles there was an artist at Rhodes of the name of Protogenes, who had attained a very high reputation. Apelles went to Rhodes to visit his renowned rival, and examine his work. When he arrived at Rhodes he went to Protogenes' studio, but found no one there but an old woman. The good dame inquired of Apelles the visitor's name, in order that she might give it to her master on his return, upon which Apelles took a pencil, and drew, upon a large panel which he found upon an easel prepared for painting, a very delicate and beautifully-formed line; this he left on the easel as "his card," and went his way. On Protogenes' return he was told what had happened, and looking on the panel, he exclaimed, "Ah! Apelles has been here; no other hand could do that!" He then, it is said, took a pencil and drew *upon* the line of Apelles, and *within* it, a still more beautiful line, and leaving his home, told the old woman to show what he had done to Apelles when he called again. Apelles called accordingly, was shown the line within his own, and thereupon drew a third line within that of Protogenes, and said, with an air of quiet exultation, to the old woman, "Show your master that." It is said that Protogenes, upon this, gave up the contest, and owned himself beaten.

Pliny states that this panel was handed down as a wonder to posterity, and was preserved in a gallery, where it was more valued than many of the most finished paintings by which it was surrounded. It was destroyed by fire before the time of Pliny, and great doubt has been thrown upon the interpretation to be given to the term *linea*, or line, as applied to this contest of skill. Some think that the lines were really sketches or outlines of what might be regarded by the artist who designed it as the most graceful that could be imagined. Hogarth considered that he had made a discovery of a curve traceable in every beautiful form. This curve he called the true line of beauty, and took great pains to establish his supposed discovery, and Apelles and Protogenes may have had their ideal lines, which they indicated in the trial of skill I have described. What these lines really were has been very much discussed, and as I don't think I shall throw much additional light upon the discussion, I will go on to another line of my lecture.

Apelles is stated to have tenaciously adhered to a determination never to pass a day without tracing some outline, a practice which gave rise, as Pliny informs us, to the proverb still in use among us, "*Nulla dies sine lineâ*." Pliny also ascribes to him the origin of another proverb with which we are equally familiar, "*Ne sutor ultra crepulam*"—or, as freely translated, "let the cobbler stick to his last." The incident which gave rise to it I shall shortly narrate. It was the practice with the Greek painters, as indeed it would appear to have been the

practice with eminent painters in Pliny's day, to expose their pictures to public criticism, they themselves being concealed behind their work. Under these circumstances, it is said, Apelles was censured by a shoemaker for having represented a sandal with a string short, a fault Apelles corrected; the cobbler the next day observing this, and being very proud of his discernment, began to criticise the leg, upon which Apelles rushed out upon him and uttered the words which gave rise to the proverb I have quoted.

A much more emphatic correction of a painter's little mistake was made about 1800 years after this by Mahomet II., with reference to the work of one Bellini, who was sent for from Venice to paint the portrait of that sultan. As a specimen of his talents, the painter presented Mahomet with a picture of the head of John the Baptist in a charger. The sultan, who was a man of large experience in such matters, saw at once that the appearance of the severed head was not true to the life, or rather to the death; and to show the artist the real thing, sent for a slave and had him decapitated then and there—a piece of criticism, the sharpness of which so frightened Bellini that he availed himself of the very earliest opportunity he could find to quit Constantinople, to which he took very good care never to return.

Apelles was the contemporary of many artists who stand high in the roll of fame, and he and they were followed for some time by others who obtained a high reputation, but art in Greece may be said from the time of Apelles to have begun to decline. After the death of Alexander great political convulsions took place, which had a most disastrous effect upon the fortunes of Greece, and the intelligent and wealthy classes had their attention drawn to more absorbing matters than the promotion of art. The public buildings were then full to overflowing with works of art, which were transferred to other countries. Rome, when it subjugated Greece, stopped there the progress of art, and plundered it of many of its most splendid works, while pictures in large numbers were transported thither for the purpose of sale. The Grecian artists also went to Rome in considerable numbers, and found there employment and profit. Rome, in fact, became the emporium of art. The taste for art that was created by the acquisition of the art treasures of Greece, and the presence of Grecian artists, does not seem to have called out much Italian talent, for there is no record of the existence of any great Roman painter when art was the most liberally patronised at Rome. Suetonius speaks of large sums expended by the emperors in pictures by the old masters, but the artists of the day seem to have been but little prized.

Pliny tells us that in his day the art of painting had greatly declined. He speaks of it as an art which had been formerly illustrious, held in high esteem both by kings and peoples, and ennobling those whom it deigned to transmit to posterity; but as an art that was banished "in favour of marble, and even gold," describing the marble as carved out "so as to represent objects and animals of various kinds"—this being evidently the mosaic work I have before referred to. After giving a very elaborate description of the component parts of a great number of colours, he says that, with all these advantages as to colour, there was then no such thing as a picture of high quality produced. Everything, he says, was superior when the resources of art were fewer, observing that the materials, and not the efforts of genius, were in his time the object of research.

You may be curious to know whether any of these wonderful pictures that have been so eulogised in times past, and so minutely described, are still extant. There is not one remaining. Byzantium, on which was founded by Constantine the present Constantinople, became, after it received that name, more rich in works of art than Rome itself. Immense art treasures were concentrated there, and became the subjects of plunder and destruction. Immense collections appear to have been destroyed by fire. Rome also was mercilessly plundered in 410 by Alaric, and afterwards by Genseric, King of the Vandals, who ruthlessly destroyed the most splendid productions of genius, creating so strong a feeling of indignation, and leaving so deep an impression on mankind, that to this day any gross outrage upon taste, or insensibility to artistic or poetic feeling, is called a vandalism. A large list is given of terrible destructions of collections by fire, but the productions of ancient art suffered, it may be said, complete annihilation during that period of time known as the dark ages, when there arose a fanatical class called Iconoclasts, or image-breakers, who, under the influence of a blinded religious zeal, destroyed all the images and pictures they could discover—an example that was followed, in a limited degree, by the Puritans, in the time of the Commonwealth.

Notwithstanding this complete destruction of the Greek paintings of a movable character, we have a vast number of specimens of ancient painting of another description, by which we can judge pretty accurately of the artistic power of the ancients, and satisfy ourselves that it was of a very high order. Herculaneum and Pompeii were two cities buried by the eruption of Mount Vesuvius in the year 79, and all traces of them were lost until the year 1711, when their remains were brought to light. Pompeii was, as you probably all know, buried by showers of ashes; over them had formed a surface which was cultivated, and a labourer, in ploughing, turned up a bronze figure of great beauty. This excited much attention, and it was found that the whole soil for miles around was formed of the ashes covering the buried city. The labour of clearing it away proved to be very small, and the city is being gradually brought again to light. About one-third of it has already been exhumed, the greatest care being taken to preserve the relics that are found, which are deposited at the Museum at Naples. I visited the place in the year 1865, when I was informed about two-thirds of the city had still to be explored. A

day or two before my visit, a fountain, beautifully decorated with mosaic work, had been discovered; and also the skeleton of a person who had probably been suffocated while asleep, as there was a great indication of repose in the position of the limbs, which the explorers had not in the least disturbed. Herculaneum was destroyed by lava, and can only be explored by excavations, it being much below the buildings erected upon its site. The art treasures obtained from the exploration of these two ancient cities threw great light upon the state of art at the time of their destruction. A large number of beautiful statues in bronze and marble, painted vases, and mural embellishments, have been discovered; besides a large picture in mosaic, representing a battle, which was discovered in the remains of a dwelling in the year 1831—a picture which shows great power of composition and perfect knowledge of perspective and foreshortening. The vases and wall-paintings would bear about the same sort of testimony to the state of painting at that time as our painted porcelain productions and the decorations of our highest-classed houses in England would bear to the pictorial skill of our present day. Pliny, in writing of the house decorations at Pompeii, speaks of them contemptuously, but Sir Joshua Reynolds formed from them a very high opinion of the painting of that day. Most of the paintings are executed in distemper, and many of the walls are coloured in fresco. Engravings have been made of all the pictures worthy of note discovered in the remains of these cities, and some of them show a grace of outline and a beauty of composition unsurpassed by any figure-drawing to be met with in the present age. The principal works (and they are very numerous) written on Herculaneum and Pompeii, and most of which are profusely illustrated, may be seen at the Public Library. The most beautiful series of ancient decorative paintings known is one illustrative of the story of Adonis, discovered in the year 1668 in some ruins near the Coliseum, and these were engraved and published in Rome in the year 1704; they are said to be worthy of any age of art, though very simple in composition.

For some centuries after the commencement of the Christian era, the practice of painting was denounced by the Christians, most of whom were then Jewish converts, who held extreme opinions as to the sin of creating objects which might become the subject of adoration or idolatry. It is stated by Origen that the Jews would not allow an artist to enter the Jewish community. In course of time the Gentile Christians exceeded the number of the Jewish, and so great was the dread of their introducing pictures into the churches, that an artist was not allowed to be baptised until he had foresworn his art, and he was excommunicated if he returned to it. The decoration of churches, however, was never totally suppressed, some of the popes and bishops encouraging the practice. In the eighth century the representations of our Saviour in the churches, which had become objects of worship, were declared by a general council of the church to be spurious.

I will pause a little in the rapid sketch I am giving of the history of painting, to consider a question of great interest—viz.: whether there ever was in existence a genuine portrait of our Saviour. The earliest known portrait is a picture discovered in the seventeenth century, which was found in some catacombs under the Church of St. Sebastian in the Via Appia, and which must have been painted about the year 220. The portrait answers very well to the following description of our Saviour, given in a letter said to have been written by one Lentulus from personal observation, and which letter appears in the writings of Anselm, Archbishop of Canterbury, in the eleventh century. The description runs thus:—"A man of stately figure, dignified in appearance, with a countenance inspiring veneration, and which those who look upon it may love as well as fear. His hair, rather dark and glossy, falls down in curls below His shoulders, and is parted in the middle after the manner of the Nazarenes; the forehead is smooth and remarkably serene; the face without line or spot and agreeably ruddy; the nose and mouth are faultless; the beard is thick and reddish, of the colour of the hair, not long but divided; the eyes bright and of a varied colour."

There is in the Church of San Silvestro in Rome a cloth called the Sancta Veronica, on which it is said there is an image of our Saviour miraculously imprinted by Himself. The legend states that one Agbarus, King of Edessa, suffering from sickness, sent a messenger to our Saviour to come and heal him; the messenger being one Ananias, a painter, who was ordered, if he would not induce Christ to come to him, to bring His portrait. Ananias, it is said, delivered the king's letter, retired from the crowd, and then attempted to draw the sacred portrait. This, however, he found it impossible to do on account of the refulgence of the countenance; whereupon our Saviour, having washed his face, wiped it with a cloth which he gave to Ananias, with an answer to Agbarus, who found the portrait upon the cloth, and was healed by the touch of it. It is said this cloth was an object of universal adoration at Edessa, until it was removed to Rome. There are other very old legends having reference to these sacred portraits, which are curious, but which I must not dwell upon.

The period between the fourth and fifth and the thirteenth centuries is described as "the dark ages." During all this time we have no record of the progress of art, if, indeed, it progressed at all. The only trace we have of the continuance of the practice of art is in illuminated manuscripts or missals, and a series of portraits of the popes in the old Basilica of St. Paul, commencing in the fifth century and carried down for a long period, including the portraits of no less than 253 popes. These interesting pictures were nearly all destroyed by fire in the year 1823. With reference to the illuminations, they abound throughout the whole of Europe. They were the

work of the monks, and show great delicacy of execution and knowledge of colour, varying much in the degree of skil displayed. Many of these are preserved in the British Museum. They improve in character as they draw nearer to our own times, and some of the fourteenth, fifteenth, and sixteenth centuries show an advanced period in art. We have copies of one or two specimens of the work of this period in our Gallery. One of the fifteenth century was purchased by Sir John Tobin, of Liverpool, at a sale in the year 1833, for the sum of £1100. The Anglo-Saxons were considered the best illuminators. These illuminations of books ceased in England at the time of the Reformation.

I now come to the thirteenth century, known as the Renaissance, or revival period, when the arts revived all over Europe, in a sudden and surprising manner. In the year 1240 a great painter was born, of the name of Cimabue, who is mentioned in the work by Vasari (which is considered the great text-book for the history of Italian art) as the painter who commenced the revival, although several artists of high character had preceded him by some years. One of the oldest paintings extant, entitled to a place in a national collection, is to be found in the National Gallery in London. It is a picture by Magaritone, and is a comparatively recent acquisition by our country; this painter died in the year 1313. Cimabue had a pupil of the name of Giotto, who as much surpassed his master as his master had surpassed others. Unfortunately, most of his paintings were destroyed by a fire which took place in Florence in the year 1771, but there are some of his frescoes in a church at Assassi, which have been engraved, and also at Padua, in a chapel which was ornamented entirely by his hand, and is called Giotto's chapel. I visited this, chapel, and must confess that the paintings did not answer my expectations, attributable, no doubt, to my want of discernment of the subtleties of art. They were, most of them, injured by damp; but an excellent idea of the appearance the chapel presented when the decorations were fresh can be obtained from a coloured drawing of it in our Gallery, where it will be found in the small room at the west end of the long corridor, where also may be seen coloured copies of the work of several artists of eminence, who flourished at or about his (Giotto's) period. He painted some portraits in fresco in the chapel of the Palazza del Podesta, among which was a portrait of Dante. Some years after their execution, the political enemies of Dante covered them with whitewash and plaster; but their existence being known, many attempts were made, but with- out success, to discover these pictures. In the year 1840 they were brought to light by Mons. Audrey Bassi, who succeeded in removing the covering, and found the pictures in comparatively good preservation. A copy of the portrait of Dante will be found in the small room to which I have already called attention.

Art continued to progress after the death of Giotto by vast and rapid strides until it reached its golden days, constituting the era of Leonardo da Vinci, Michael Angelo, and Raffaelle, all of whom flourished in the fifteenth and sixteenth centuries. The biography of any one of these celebrated men would yield materials for two or three interesting lectures, but I am compelled on the present occasion to limit myself to a few words in referring to them. Leonardo da Vinci was a Florentine born in the year 1452, and seems to have been what is called a universal genius. There is a most interesting letter of his preserved in the Ambrosia Library, at Milan, addressed to the Duke of Milan when Leonardo was about thirty years old, in which he offers his services to the Duke, and gives a statement of what he considers he can accomplish. In that letter, which I wish I had time to read to you at length, Leonardo, who seems to have had a very versatile turn of mind, professes his ability "to make portable bridges, for facilitating running *after* or running *away* from an enemy—to burn and destroy the bridges of an opposing army—to draw away water from a beleaguered city—to destroy any fortress not built of stone—to work his way underground anywhere—to make cannon of beautiful form and quite out of the common method—to make vessels bomb-proof;" and after enumerating other feats, which he states very confidently he can accomplish, in carrying on warfare, he states:—"In time of peace, I think I can as well as any other make designs for buildings. I will also undertake any work in sculpture, in marble, in bronze, or in terra-cotta." Adding, as though that were something that it might be worth while to mention, although not of much importance—"Likewise, in painting I can do what can be done as well as any other, be he whom he may." It appears that the Duke took Leonardo into his service, and that Leonardo thought more of schemes connected with engineering than of painting, and to have had a particular fancy for constructing water supplies, which he was exceedingly disgusted at not being able to get carried out. In this respect a remarkable painter of our own day, Martin, resembled him, for Martin, when he was exhibiting his picture of "Belshazzar's Feast," was boring the public with a scheme to supply London with pure water, effectively illustrating his invention with drawings which strangely contrasted with the work he was exhibiting. Leonardo da Vinci is universally known by his remarkable picture of the "Last Supper," engravings of which may be found in every part of the civilised world. That wonderful production was painted by him for the refectory of a convent at Milan, and was, it is said, the first picture he painted in oil; and a pretty mess he made of it, for the picture about the middle of the sixteenth century began to perish, in consequence of some defect of his making up of this then new medium, or vehicle, as it is called. The picture, however, had been previously so much admired that several copies had been made of it; and it is from these copies that the engravings, with which we are so familiar, have been executed. One of the best of these copies was painted in the year 1510 for another convent, and was

finished when the original, which is now almost totally decayed, was in a perfect state. This copy was purchased by Sir Thomas Lawrence, and is in the Royal Academy. It is a much better criterion of what the original was than the original itself, which has been repaired, as it is called, by inferior artists, who, it has been said, have left nothing of the picture but the heads of three of the apostles, and these are now very indistinct. I have myself seen the picture, which is at the end of a dull-looking, gloomy hall, and can only be very imperfectly seen, the custodian of the chamber furnishing you, for a small gratuity, with "aids for development" of the work, in the shape of binoculars, which are greatly needed. A very amusing description of the picture, and of the circumstances under which it is exhibited, will be found in that most humorous work, the *Innocents Abroad*, and I can vouch for the accuracy of the representation there given of the picture and its surroundings.

Michael Angelo was a contemporary of Leonardo, and there seems to have been a considerable jealousy felt by the latter of the former. They were each employed to paint a picture for the council-hall in a Florentine palace. The pictures were to have been in fresco, one at each end of the hall, and it is said that although Leonardo composed the cartoon, or "sketch on paper," from which his picture was to be painted, he was so jealous of Michael Angelo, then a much younger artist, that he would not go on with the work. Vasari pronounces the two cartoons prepared for these intended pictures as being sufficient to form a school of art for the world. Unfortunately, they were both destroyed a few years after they were produced. Leonardo, who seems to have been very sensitive, easily offended, and capricious, died, after a somewhat adventurous life, in the year 1519, when he was 67 years old, leaving a large number of works which distinguish him as one of the finest artists the world has produced. Michael Angelo's renown is as great, if not greater, than that of Leonardo. Michael Angelo first distinguished himself as a sculptor, and was remarkable for his great anatomical knowledge, which he was particularly fond of displaying in his sculpture and in his painting, leading him often into violations of good taste and into gross exaggerations. The work by which Michael Angelo has established a fame that seems likely to endure to the end of time, is his series of fresco paintings in the Sistine Chapel, in Rome, executed by the command of Pope Julius II. Michael Angelo was very diffident of his abilities as a painter, and tried to evade the execution of the Pope's command, strongly urging him to employ Raffaelle, as better qualified; but Julius would not be put off, and insisted on Michael Angelo setting to work. It is said that these were the first frescoes he had ever executed, and so timid was he in proceeding that, after drawing the cartoons, or paper sketches, he sought the aid of some of his fellow artists to execute the frescoes; they, however, so bungled the work that Michael smashed up all they had done, and executed the whole of the frescoes with his own hand, a work he accomplished with wondrous rapidity. In twenty months the whole of the ceiling frescoes were finished. The Sistine Chapel is an oblong building, 133 feet in length, 43 feet in width, and 58 feet in height, and is reserved especially for the use of the popes. The ceiling frescoes, and the great fresco painting of the "Last Judgment" subsequently painted by Michael Angelo on the altar wall of the chapel, are regarded with the deepest reverence. They are the subject of earnest contemplation by art students, and many a visit has been made to Rome for the sole purpose of contemplating these frescoes, and those of Raffaelle in another part of the Vatican, with which the Sistine Chapel is connected. Raffaelle was born in 1483, a few years after Michael Angelo, and died at the early age of 37. He covered with painting, in fresco, four apartments in the Vatican, which are called at the present day by his name, and have been and are visited by artists and lovers of art from every part of the world. Many works have been published giving full descriptions, accompanied by engravings, of these celebrated frescoes. Raffaelle, however, is better known to our countrymen by what are called "the cartoons," of which engravings numberless have been produced. The history of these cartoons is so remarkable that I cannot pass it over. A cartoon is a large outline on paper, with a very slight amount of shading, painted in monochrome, or one colour, from which a picture is to be afterwards painted in fresco, or worked in tapestry. Certain tapestries were required for the wall of a portion of the Sistine Chapel, reserved for the special use of the cardinals. Raffaelle was employed to design these tapestries, ten in number. Ten cartoons were drawn, and the tapestries worked from them are now in the Vatican; but the cartoons from which they were worked seemed to have been altogether neglected and uninquired after for many years. Seven of them were afterwards found by the celebrated Rubens, at Arras, where great tapestry works were fabricated, and he induced our Charles I., a patron of his, to purchase them. After the decapitation of Charles, they were, at the suggestion of Cromwell, purchased for the nation at the price of £300, and ultimately found their way to Hampton Court Palace, from whence they have now been transferred to the Kensington Museum. The best means of judging of these cartoons are to be found in a series of large photographs, of which copies are in this building; they are facsimiles of the original, showing the rough treatment they received since they left the artist's hand, as well as the true spirit of the artist's conception, which no hand-engraving could adequately convey.

From this period, which is called the Renaissance, art became disseminated and established all over Europe, and the different countries produced leading artists, each of whom had many followers. The works of these artists and their followers constituted what are called, in art parlance, "schools."

It is unnecessary for me to describe at great length these schools, since every particular relating to them, and the names, principal works, and characteristics of their followers, are to be found tabulated on the walls of our Gallery on charts, which contain in themselves a condensed history of painting. We are indebted for these charts to the energetic and enthusiastic President of this institution (Sir Redmond Barry), who will hereafter be acknowledged in the history of our colony as the man who the most earnestly promoted its creation, and who watched over its progress, from the laying its first stone, with an interest and devotion to which was entirely owing its early prosperity.

Correggio and Parmegiano were the representatives of the school of Lombardy; of the Venetian school—Titian, Giorgione, Tintoretto, and Paul Veronese. Tintoretto painted the largest oil picture in the world, which is to be seen at Venice, being 74 feet in length by a height of 30 feet. Paul Veronese painted one 30 feet wide and 20 feet high, which is in the gallery of the Louvre, where I have seen it with a crowd of artists before it copying, some the whole (of course on a small scale), and some merely portions of it; and very much interested I was, although they did a little obstruct the view of the pictures, in watching them as they seemed to be devouring it with their eyes, some perched up upon scaffolding formed by a plank placed upon the steps of two double ladders, without the assistance of which they could not examine the beauties of the higher portions of the picture. Van Eyck is considered the leading artist of the Flemish school. Quentin Matsys belongs to it, who, it is said, was a blacksmith, and became a painter to propitiate a painter, with whose daughter he fell desperately in love, and whom he afterwards married. Although called a blacksmith, he was really a designer of ornamental ironwork, and was as much an artist in that particular kind of work as the celebrated Benvenuto Cellini, whose works have now an almost priceless value. As immediately introductory and leading into the English school—or what I choose to call the English school, for I believe English art has not yet had this distinctive appellation authoritatively given to it—I will say a few words upon the school of the Netherlands, to which belonged Rubens, Rembrandt and Vandyk. Rubens was born in 1577. His works are so celebrated and so well known that it is scarcely necessary to speak of his artistic power. One of the longest galleries in the Louvre is covered with his works, and our National Gallery is rich in specimens of his skill; but his greatest work is at Antwerp, where he studied painting and lived the greatest part of his life. It is in the cathedral there; the subject, the "Descent from the Cross;" and the picture is copied by almost every student who visits the Continent for improvement in his profession. Rubens visited England and was largely patronised by Charles I., as also was Vandyk, who painted the portrait of that monarch. Vandyk, the pupil of Rubens, in the opinion of many, and I am one of the number, surpassed his master, although his principal pursuit was portrait painting. There is a very large number of his works in England, and two or three fine specimens in the National Gallery. Rubens and Vandyk were followed by Rembrandt, who certainly surpassed both of them, and introduced a completely new style of painting constituting the "School of Rembrandt." Of Rembrandt's work we have some magnificent specimens in the National Gallery. Rembrandt never visited England, but his works found their way there. The celebrated Gerard Dow, Meiris, Metzu, Linglebach, Teniers, Wouvermans, Ostade, Paul Potter, Vandervelde, Rusydael, Berghem, Both, and Carl Du Jardin, all belonged to that school, and we have fine specimens of the works of all these artists in our national collections.

To the production of the artist school of the Netherlands may be traced, as I think, distinctly, the creation of a love of art in our own country, and, as its consequence, the progress of art among ourselves. There is so little evidence of our having taken any interest in art before the time of Henry VIII., that up to the time of that monarch it may be said that we had no art history. The first painter of eminence who came among us was Hans Holbein, a native of Switzerland. He came to England in the year 1526, and remained until his death, which took place in the year 1554. He was little more than a portrait painter, and was largely patronised by Henry VIII., of whom he painted several portraits. A large number of his pictures may be seen at Hampton Court, and as portraits of eminent persons of the day some of them are exceedingly interesting, though their accuracy as portraits can scarcely be trusted to. Of painting, it is said by Aristotle, imitations must be either superior, inferior, or equal to the model; and he praises Polygnotus, because he painted men (and I presume women) better than they were. On this principle, I presume he would have been delighted with Holbein, who seems to have been a flatterer in his portraits, and a pretty deal of mischief this flattering occasioned. Holbein was sent to paint a portrait of Anne of Cleves, that Henry might be able to judge whether he should like her as a wife. Holbein drew so flattering a portrait, that Henry made up his mind she "would do," and had her brought over to England, when he found her not at all equal to sample; but was, nevertheless, obliged to complete the contract. Henry, who was horribly disgusted, visited his indignation, not upon Holbein, but upon his minister (Cromwell), who had recommended this portrait-taking arrangement; and who ultimately lost his own head because Holbein had not correctly copied that of Anne of Cleves, a head which, upon canvas, might have been regarded as a portrait of Venus, but which Henry declared to be in reality like that of a Flanders mare.

Our First Charles was also the first real English patron of art. He caused not only Rubens and Vandyk, but other artists, to visit England. At Rubens's suggestion, he purchased the cartoons. He formed a very valuable

collection of pictures, all of which were afterwards sold or dispersed. The Puritan Parliament gave directions that all pictures in which there was a representation of the Saviour, or the Virgin Mary, should be burnt. After the restoration, many of the pictures were returned to the royal collection in the Palace of Whitehall, where they were destroyed in the great fire, which consumed the whole of the palace, except the banqueting chamber, which still fronts Parliament-street, nearly opposite the Horse Guards.

Notwithstanding the taste that was created for art at that time in England, its immediate effect with us, like the creation of a taste for art in Italy by the introduction of Grecian painting and Grecian painters, was not at first to bring out native talent, but to gratify itself by the acquisition of foreign works. There is also a curious parallel between the progress of art in our own country and in Italy. Soon after the feeling for it was created there, the Iconoclasts sprung up, who repressed its progress for a time with us. After Charles I. gave it birth in England the Puritans came into power, and in the most ruthless and bigoted spirit, struck down, as far as they could, everything that was its offspring. Charles II. was a lover of learning, fancied himself perhaps a lover of art, and professed to encourage artists; but his taste was very effeminate and frivolous, and he encouraged the production of most ingenious absurdities in the decoration of ceilings, staircases, &c., which were covered with what was called classical productions from the pencil of one Verrio, whose works are still to be seen in many of the old mansions. Dickens, in *Bleak, House*, describes one of these ceilings in a mansion in Lincoln's Inn Fields, occupied as chambers by Tulkinghorn, the lawyer, and which he makes the scene of the lawyer's murder, describing the figure of a Roman introduced in the painting as pointing down from the ceiling on his lifeless corpse. Sir Peter Lely, however, appeared in England about this time, and is thought by some to have approached nearly to his immediate predecessor, Vandyk. Most of the mansions of our old families have some portrait from his easel; and he is well known as the great painter of what were called King Charles's beauties. He was followed by Sir Godfrey Kneller, who practised his profession in the reign of Charles II., and during the reign of the five succeeding monarchs. The first true historical painter of our own country was Sir James Thornhill, who was employed in the decoration of the dome of St. Paul's and of Greenwich Hospital; but was paid in a very undignified manner—viz., at the rate of 40s. per square yard. After his death art seemed to retrograde for a time rather than progress, although there was a painter of the name of Richardson, who wrote a work upon art, showing the highest feeling for it, and laying down principles which have authority at the present time. He himself, however, had not skill sufficient to demonstrate their value, and it is said by Sir Horace Walpole, at the commencement of the reign of George I., art in England had fallen to its lowest ebb.

Richardson died in the year 1745, leaving behind him an artist of some celebrity in the person of his son-in-law, one Hudson, whose celebrity, however, as an artist is completely merged in that of his pupil, the illustrious Sir Joshua Reynolds, who may be said to head the list of the names which will hereafter give England a position in art little lower than that which she has taken, and which we trust will ever occupy, in science and in all those mental achievements which constitute the true glory of a people.

Cotemporaneously with the appearance of Reynolds, there shone forth a genius of another character, that of Hogarth, who was originally apprenticed to an engraver, but raised himself to the rank of one of the first painters in a style which he originated, but which has never been followed or since entered upon. He married the daughter of Sir James Thornhill, who was at first deeply wounded at what he considered the degradation of the alliance. It took some years to reconcile him to the match, and the first step towards the reconciliation was effected by Lady Thornhill procuriug one of Hogarth's pictures, and placing it secretly in Sir James's dining-room. "Whose painting is this? " he exclaimed, with delight. "Hogarth's," replied his wife. He rose up much agitated. "Very well, very well," said he; "the man who can paint like this can maintain a wife without a portion." A perfect reconciliation, however, very soon followed. Hogarth's life is one of the most interesting in the biography of art; but I must take leave of Hogarth to return to Sir J. Reynolds, who was about thirty years Hogarth's junior. He was born in the year 1723, three months before the death of Sir Godfrey Kneller. His father was a clergyman, who was by no means gratified at the taste his son showed for drawing, and marked his sense of his son's genius by writing on one of his early productions, "Done by Joshua out of pure idleness." His strong love for art, however, could not be repressed, and ultimately he was placed under Hudson as a pupil, and soon progressed so rapidly that Hudson became jealous of and got rid of him. He had, however, attracted the notice of Captain, afterwards Lord Keppel, who took him with him on an expedition which enabled him to visit many places in Europe, where he saw works of art of the highest character, and procured him so much patronage that he was enabled to gratify the earnest desire of his heart—viz., to visit the Sistine Chapel. To his amazement, when he came into the presence of these glorious frescoes, of which he had heard and read so much, and by which he expected to be entranced with admiration, he found himself perfectly unmoved. In one of his letters he thus refers to this moment of his life :—"It has frequently happened, as I was informed by the keeper of the Vatican, that many of those whom he had conducted through the various apartments of that edifice, when about to be dismissed have asked for the works of Raffaelle, and would not believe that they had already passed through the rooms where they are preserved, so little impression had these performances made

on them. I remember very well my own disappointment when I first visited the Vatican, but on confessing my feelings to a brother student, of whose ingenuousness I had a high opinion, he acknowledged that the works of Raffaelle had the same effect on him, or rather that they did not produce the effect which he expected. This was a great relief to my mind, and on inquiring farther of other students, I found that those persons only who from natural imbecility appeared to be incapable of ever relishing these divine performances made pretensions to instantaneous raptures on first beholding them. I did not for a moment conceive or suppose that the name of Raffaelle, and those admirable paintings, in particular, owed their reputation to the ignorance and the prejudice of mankind; on the contrary, my not relishing them, as I was conscious I ought to have done, was one of the most humiliating things that ever happened to me. I found myself in the midst of works *executed upon principles with which I was unacquainted*. I felt my ignorance, and stood abashed."

Reynolds remained in Italy three years, and on his return to England found himself subjected to a criticism and a jealousy which for a time gave him considerable pain. His old master, Hudson, when he looked at his pictures, exclaimed, with an oath, "You don't paint so well as when you left England." But the contest with his fellow-artists was of short continuance. His fame soon spread far and wide, and brought him into association with Dr. Johnson, who formed a strong friendship for him, which continued until the close of life. This is the more remarkable, as Johnson evidently considered artists a rather inferior class of persons; nor did he greatly admire actors, although Garrick was one of his associates. Sir Joshua painted a portrait of Johnson, in which he represented him as reading with the paper close to his eyes, showing he was near-sighted, at which he was very angry. "Sir," said he, "it is not friendly to hand down to posterity the imperfections of any man." Mrs. Thrale tried to pacify him by telling him he would be known to posterity by his talents, not by his defects; and remarked that Reynolds, in painting his own portrait for her, had introduced his ear-trumpet, showing he was deaf. "Madam," said Johnson, "he may paint himself as deaf as he chooses, but I will not be painted as 'blinking Sam.'" The great event in Sir J. Reynolds' life, and which is now exercising, and always will exercise, an immense influence upon art in our country, and, indeed, throughout the world, was the establishment of the Royal Academy. In the year 1760 the first public exhibition of works of modern painters, sculptors, and architects took place in London, and has been truly described as one of the most memorable events in the annals of modern art. Its success was immense, and led to a second exhibition the following year. Johnson described it as "an exhibition by which the artists please themselves with the multitude of spectators, and by imagining that the English school will rise much in reputation." He says, "Surely life, if it be not long, is tedious, since we are forced to call in the assistance of so many trifles to rid us of our time—of that time which can never return." Johnson, however, though he thus contemptuously alludes to the exhibition, wrote a preface to the catalogue of the third exhibition, at which a charge of one shilling was made to every person for admission, in order to check the thronging of the exhibition with crowds, who prevented any from examining the works exhibited with comfort to themselves. Reynolds contributed to these exhibitions, which ultimately became merged in, or rather gave rise to, the present Royal Academy in the year 1768, of which Reynolds accepted the presidency, at the express request of George III., who bad previously conferred upon him the honour of knighthood.

It was in the year 1780 that the yearly exhibitions first began at Somerset House. Between the year 1768 and that year the exhibition had produced about £1500 yearly; in 1780 the receipts reached £3000, and they may be said to have gone on increasing up to the present time, the exhibition now, as I suppose you all know, taking place on the first of May in every year, in a gallery lately specially erected at Burlington House, Piccadilly—the National Gallery, Trafalgar-square, having been found, in many respects, unequal to the requirements of our yearly national exhibition.

The influence of the Royal Academy upon art, and the immense benefit it has conferred upon its professors, it would be difficult for me to do justice to, even were I to devote a whole evening to the subject. I have not time now even to describe generally all its objects. It is an association consisting of forty academicians, being painters, sculptors, or architects; A second order, called associates, being twenty in number, from which the vacancies in the academicians are supplied. The academicians elect the members of their own body, but their election must be ratified by the Crown. There are also six associate engravers, elected by the academicians from those exhibitors of engravings who declare themselves candidates. There are several other officers and professors, all of whom are either nominated by the Crown, or elected by the academicians, and approved by the Crown; and these professors have to deliver lectures to the students. There are schools for study from casts, from living models, and a painting school. All painters, sculptors, and architects are admissible as students upon showing reasonable indication of talent, the specimens of their works being received anonymously; and all are allowed to exhibit their works at the annual exhibition, if their works are sufficiently artistic not to excite ridicule, and there be room for their reception—many works being now unable to obtain a place, in consequence of the large number sent for admission. If any artist evinces great talent, he is chosen as an associate, as vacancies occur, and ultimately becomes an academician, or R. A., as it is called—an addition to an artist's name which is a sure guarantee of considerable ability. The arrangement of the pictures at the annual

exhibition is settled by a committee called a hanging committee, and every year there are as many discontented artists as would suffice to hang up every member of the committee himself in *propriâ personâ*, which would probably be done were not the dissentients restrained by the terrors of the law or the precepts of Christianity.

Of this academy Reynolds was chosen president, and continued in office for 21 years. During that time he delivered his celebrated discourses, 15 in number, which constitute one of the text-books of modern art.

The history of painting in England, from the formation of the Royal Academy, may be traced in the catalogues of the yearly exhibitions, all of which, from the first to last published, are to be found on the shelves of our Public Library. The first catalogue shows only 136 works, and the only artists of note that exhibited were Angelica Kaufman, West, Zucarelli, Bartolozzi, Wilson, Gainsborough, Bacon, the sculptor, and Sir Joshua Reynolds. Some of the exhibits seem to have been very unimportant affairs. One Michael Angelo Rooker contributes two works of art, which he describes as "stained drawings." Wilson sends three pictures described as "landskeps," with the old form of spelling, whilst Gainsborough adopts the more modern word landscape. The number of exhibits increased from year to year very rapidly, soon occupying the whole of the available space at Somerset House; and from that time the number of pictures sent for exhibition has always been largely in excess of the powers of representation. This has led to a great number of subsidiary yearly exhibitions by persons associated together under different titles, such as the Society of British Artists of Painters in Water-colours, and others.

The history of painting in England, from the formation of the Royal Academy, may be traced in the catalogues of its yearly exhibitions. Cotemporaneous with Reynolds were, in addition to the artists I have mentioned, Barry, Opie, and Fuseli, all of whom delivered a series of lectures at the academy. Since Reynolds's time there has appeared so vast an array of artists, whose works will live to all time, that I will not mention any, lest I should appear to consider those mentioned as superior to a large number quite equal to them in talent, but to whom time will not allow me to refer.

Before closing my lecture, I will make a few remarks upon what may be regarded as our own art prospects. That we have a great deal of talent, trained and untrained, was evidenced by the exhibition of colonial artists that took place last year, not far from this lecture-room. Many of the pictures would have graced the walls of the galleries of the Royal Academy, while some would most undoubtedly have never been permitted to appear upon them—some showing what genius can produce when carefully trained, others what vagaries it can indulge in when it works without guidance.

Since this lecture was delivered there has been a second exhibition, so vast an improvement upon the first as to justify the belief that our Australian pictures will in a very few years compare as favourably with those produced by the artists of the mother country as do our fruits and flowers with their counterparts in our native land.

Without going so far as Cennini, whose course of study, spreading over about 13 years, I have brought under your notice in a former part of this lecture, it is quite certain that no one can advance surely in the path of art who does not move on slowly, considering well the effect of every step, and ever keeping in his mind the highest examples of art that he has been privileged to look upon. We have here in our galleries some specimens of painting which a friend, whose judgment is worth having, and who has lately returned from England, assures me will compare favourably with any pictures to be found in the yearly exhibitions in London. That in our gallery to which we have given the name of the "Dancing Girl" has been reproduced by the artist, and is exhibited this year in the Royal Academy Exhibition, under the title of "A Question of Propriety," with a reference, not to a passage in Longfellow's poem of the "Spanish Student," of which we have assumed it to be an illustration, but to "Annals of the Inquisition in Seville, 1627." This repliqua is not an improvement on our picture, still it excites in England as much admiration as that we bestow upon our own. This picture and several others, including those of Von Guerard, Buvelot, and Chevalier, are sufficient to create a standard of art of a very high description; and without such a standard before them, our art-students would be injured rather than benefited by admission to the gallery for the purpose of study. We have, in addition, excellent casts of the most beautiful works of sculpture that are to be found in Europe, and the efforts of our art-students to emulate these examples of painting and sculpture are guided by skilful instructors, Messrs. Von Guerard and Clark, themselves artists of great ability. Of the talent of our students we have unmistakable proofs in the result of their labours, showing that the average ability of the small band of students to be seen at work in our gallery is not below the European standard. I have watched copyists in the galleries of Europe copying with a fidelity which would have made it difficult to distinguish the copy from the original; yet I say that there is a lady student in our gallery who would have no reason to shrink from a trial of skill with any copyist I have ever seen at an easel.

I believe that in future years Australia will resemble Italy in its art characteristics as closely as it now resembles it in its climate. I believe, moreover, that, when we have a larger and a more leisure population, art will be as warmly patronised here as it has ever been in countries where wealth has been combined with leisure

for its enjoyment, and taste and education have guided its expenditure.

I must now bring my present lecture to a close. I have endeavoured to give a general outline of the history of painting, tracing it from its first appearance as an art down to our own days. It is an art which has always attracted to it the highest minds, and has always taken a deep hold upon the feelings and sympathies of mankind. It constitutes a language, which all can interpret, for communicating ideas of the noblest character—a universal language grander than that of poetry itself. It presents nature in her most attractive garb, and under her most sublime aspect, and brings before the eye and stamps upon the heart scenes, events, and feelings which arouse within us emotions which may leave their influence upon us for good while life endures.

The Growth of Language.

A LECTURE, DELIVERED BY M. H. Irving, M.A.
(*Head Master of Wesley College, late Professor in the University of Melbourne),*
On 16th November, 1871.

MR. CHAIRMAN, LADIES AND GENTLEMEN—

ABOUT a year ago, one of the organs of public opinion in this city took me severely to task, and threatened me with divers awful consequences, because I, then filling the position of professor in the University, could find it possible to spend a little of my leisure in helping with my poor judgment to select a crew to represent the University of Melbourne in friendly rivalry with her sister of Sydney, but had refused to lecture on Technology, because I was too busy. Of course I laid the rebuke to heart, conscious that in some mysterious way it was deserved; although in the first place I hadn't been asked to lecture on Technology, and in the next place, if I had been so desired, I should not have known how. But when my friend, our worthy chairman, who is heart and soul devoted to technology, and under whose guidance I trust to have my crass ignorance enlightened, and do my little possible on its behalf, asked me for a lecture in this course, I willingly consented, being assured by him that I might select any subject of general interest, and that my lecturing here to-night was quite compatible with very slender acquaintance with art pure, art manufactures, or technology.

I am a profound believer in the good old maxim, "*ne sutor supra crepidam*"—let the cobbler stick to his last; and, therefore, in place of getting up something I did not know, wherewith to trespass on your attention to-night, I have ventured to choose a subject with which I have been for years necessarily somewhat familiar, and to which, like many other common things around us, we are prone perhaps to pay but little heed—Language, that wondrous offspring and handmaid in one of human thought. "*Omnia exeunt in mysterium*, as some one says; or if he doesn't, he ought to have said it" (I quote from Charles Kingsley's philosophic artist); and of all the mysteries that lie around us from our cradle to our grave, always saving the mystery of life itself, I know none so passing wonderful as this mystery of language.

Whence came it? Whither tends it? Whence this strange vital tenacity of its own? Generations that use it flow and ebb like the tide, and are known no more; but language abides, worn it is true by their use, but as little destroyed thereby as the rocks that are fretted by the ever-recurring tide of ocean. It seems to each of us but a part of himself, something he can make or unmake. Can he? Which of us here present has given to our English speech one new word? which of us can take from our mother-tongue one single word, and bid it be no longer? If we made it, verily it is stronger than we.

And yet, in a sense, man did make language as much as he has made aught else that is his. Man can *create* nothing; he must have somewhat given him first to work upon, and all our technology, I take it, is but studying how best we may modify that somewhat given from elsewhere—be it language, where to entrusted, noble thoughts live for ever; or the marble of the sculptor, wherein form divine abides imperishable; or the pigments of the artist, whereby beauty of colour as well as grace of form gladdens our eyes; or the marvellous wealth of elementary substances that nature scatters around us in profusion, and the chemist's art teaches us to modify and recombine for the delectation and comfort of our material life.

Whence came language, in its very simplest type? Some hundred years ago, when the doctrine that man is the measure of all things was even more in vogue than it is now, one set of philosophers gravely propounded the doctrine that men met, and in solemn conclave assembled did then and there pass their act of *parliament*—for parliament you know means only *speech* (a meaning sometimes too significant)—and gave to each thing its appointed name, to every act its proper verb, to every quality its fitting adjective. A pretty fancy, in faith, but one which hardly commends itself to us! For how, ere this agreement of the people, did the individual paterfamilias signify his wants to his spouse, his orders to his children, if language was not ere this solemn act of uniformity? And, if we waive this difficulty, how did the delegates who formed language argue, discuss, divide, and determine, if language was not yet? No, we can as little believe that man existed without language, as we can that he ever existed without thought—"like the beasts that perish." But, though we reject

this, the theory of Maupertuis and the Berlin Academy, we may as little give credence to the opposing view, that his Creator endowed man at the outset of his career upon the earth with a full and completely organized language; for such a theory, besides being opposed to all the history of linguistic development, so far as we have it in our possession, is *à priori* absurd. It supposes the mind of man stored with words, the symbols of notions, which as yet had been called forth by no experience. Rather should we believe that the words, as well as the thoughts, rested only potentially in the human mind, ready to be called into being so soon as needed; that He who gave to man the power of observing, of analysing his sensible impressions, of forming out of the multiplicity of individual objects around him general notions, and so classifying and reducing to order what must at first have seemed an infinite chaos, gave him also, therewith, the power of first attaching names to the individual objects, and then extending these to classes: the process of nomenclature corresponding precisely to, and synchronizing with, the progress of thought.

But what determined the special sign, the peculiar sound, which should come into being when man came in contact with some individual thing, or generalized from it? Why, for instance, should the root *sta-* be indissolubly bound up in our own language, and the large family akin to it, with the thought *stand*, verb or noun, it matters not which? Why should the sound *re* be appropriated to smooth, swift motion, as in the Latin rivulet, or the simple English *run?* or why, again, should *sed* in Latin, *sitz* in German, *sit* in English, all denote the same posture, as when we might speak of a sedentary sitting in a sitz-bath, using words belonging to all of the three kindred tongues. I cannot answer the question, nor do I believe it ever will be answered. Perhaps, with regard to two of my instances, you may say that it seems to you that the sound of *sta-* suggests naturally the thought of fixity, of motion arrested, of unyielding resistance, even of solidity; and tell me, what is perfectly true, that you find them severally, in *stable*, in *stay* or *stop*, in *stubborn*, and in *stuff*, our old English word for what we now commonly call matter. And again, you might say as to the use of the radical *re-*, that the very roll or trill of the *r* which begins it suggests the idea of smooth, onward gliding. I cannot say it is not so, and your theory would come very close to the doctrine of phonetic types, first set forth in English in Max Müller's celebrated series of lectures on the "Science of Language," a view embodied in a passage which I shall venture to quote:—"The 400 or 500 roots which remain as the constituent elements in different families of language are not interjections, nor are they imitations. They are phonetic types, produced by a power inherent, in human nature. They exist, as Plato would say, *by* nature, though with Plato we should add, that when we say by *nature*, we mean by the hand of God. There is a law which runs through nearly the whole of nature that everything which is struck rings. Each substance has its peculiar ring. We can tell the more or less perfect structure of metals by their vibrations, by the answer which they give. Gold rings differently from tin, wood rings differently from stone, and different sounds are produced according to the nature of each percussion. It was the same with man, the most highly organized of nature's works. Man, in his primitive and perfect state, was not only endowed like the brute with the power of expressing his sensations by interjections and his perceptions by onomatoœia; he possessed, likewise, the faculty of giving more articulate expression to the natural conceptions of his mind. That faculty was not of his own making. It was an instinct of the mind as irresistible as any other instinct. So far as language is the production of that instinct, it belongs to the realm of nature. Man loses his instincts as he ceases to want them. His senses become fainter when, as in the case of scent, they become useless. Thus, the creative faculty which gave to each conception, as it thrilled for the first time through the brain, a phonetic expression, became extinct when its object was fulfilled. In the beginning the number of the phonetic types must have been almost infinite." In the case of certain sounds, as we have just observed, we may fancy that we, too, can recognize even now the original thrill of thought that caused the word to spring to life; but these are few and far between, and for the most part we can find no clue to the lost link of connection between thought and speech. Why, for instance, should *mah* in Sanscrit, *mag* in Latin, *much* in English, all denote great, or why should the sound found in our English *mill* be in every European language appropriated to the act of grinding? Yet, though the theory of phonetic-types shadowed forth in the passage I have quoted can be distinctly traced in but few instances, it seems infinitely preferable to its two rivals, to which, in the passage quoted, Professor Max Müller somewhat slightingly adverts, which he almost cruelly nick-named the pooh-pooh and the bow-wow theories, or, as their votaries more respectfully style them, the interjectional and onomatopoetic theories of language.

As each of these finds numerous and eager supporters, it may be well briefly to advert to them. The interjectional would derive all language in the first instance from those involuntary utterances whereby men express the feelings which they themselves experience when brought suddenly into contact with various kinds of objects. For instance, the advocate of such a view would maintain, as, indeed, Mr. Wedgwood in his English Dictionary does maintain, that all such words as *foul, filthy, fiend*, are immediately derived from the interjection *fie* or *faugh*, whereby we express our instinctive abhorrence at aught repulsive; that *huge* and *ugly* are similarly due to the guttural *ugh* of disgust; *wail* and *weep*, to the plaintive utterance of "*woe*." The onomatopoetic, again—I must apologise for this long Greek word, but I cannot help it, for there is no precise equivalent for it in

English; perhaps, however, I might use imitative for it—the imitative theory, then, says that man, hearkening to the diverse sounds around him, produced whether by animate or inanimate nature, was led to name from these the individual objects that produced each several noise, or the sound itself; and would point in confirmation of their view to such words as *crow, croak*, or even *raven*, originally *hrafn*, wherein they would say we can yet hear the harsh cry of the hoarse bird; or, again, to the Latin *ulula*, the English *owl*, as imitative alike of the tu-whit to-whoo of the melancholy bird of night that to the moon complains from her ivy-mantled tower; and would point triumphantly to such names as the English whippoorwill and peewit, or our Australian mopoke, in which we cannot for one moment doubt that the name is directly taken from the note. Or turn, they would say, to your verbs; what plainer imitations can you ask for than the *drop, drip*, or *drizzle*, whereby you express the action of water falling, with a greater or less volume, and consequent intensity of sound? What are you doing, but imitating as best you may the sound you hear, when you speak of the tinkling cymbal, the babbling brook, or the plashing fountain; the din of battle, and the clashing of swords; the clank of chains, the rattle of musketry, or the roar of the thunder. We are compelled to admit that the advocates of each opinion can make out a strong case, can cite many words which are on their theory clearly explicable; but we cannot accept either as sufficient to explain *all* the roots of language. In fact, it might be a sufficient answer to the first to say, that not all, in fact very few, natural objects are such as to call forth in the observer feelings so strong as to require the relief of an interjection outcry; and to the latter to point out that earth has indeed her many voices, yet sound is not by any means a universal characteristic of the objects around us, still less of those glorious objects set in the heavens above us, whereunto man must early have looked up, and for which he must have found names; of which Addison well wrote—

"The spacious firmament on high,
With all the blue ethereal sky
And spangled heavens, a shining frame,
Their bright Original proclaim.
What though no real voice or sound
Amid their radiant orbs be found,
In reason's ear they all rejoice,
And utter forth a glorious voice,
For ever singing, as they shine,
'The hand that made us is divine.'"

I have thus endeavoured briefly to put before you the competing theories of the origin of language, and have indicated that which to my mind most commends itself, though I am bound to admit that, like its rivals, it is not able to give in all points a satisfactory account of itself. Thus much seems clear, that the very earliest development of vocables or phonetic types, if we take Max Müller's word, was spontaneous, and not a deliberate, considered manufacture. So little able are we, "the heirs of all the ages, and the long results of time," to carry ourselves back in imagination to the state of mind of our earliest ancestors when brought face to face with the world around them, that we find a grave controversy among philosophers as to the import of these primeval words. Quoth one authority, "It is perfectly clear that the earliest word must have been the noun, the name of this or that thing." Quoth another, "Nay, I claim higher antiquity for the verb, the name of action, for things are distinguished from one another only by motion or change. Were the universe at rest no one part could be recognised as diverse from another." Who shall decide when doctors disagree? Let us be content simply to say we can as little imagine language, as a means of communication of thought, existing with nouns alone, as we can, on the other hand, think of it as made up entirely of verbs; and directly it arose from the merely conversational into the narrative stage we can sec that it must have attained to the distinction of pronouns, *me, thee, him*, or *that*, denoting severally the speaker, the person addressed, and the subject of the talk. And besides these three classes of words or parts of speech, a fourth must very soon have taken its origin in the simpler adjectives, expressing the obvious, plain distinctions between objects otherwise similar, such as *large* and *small, many* and *few, bright* and *dark, strong* and *weak*. And to these must early have been added the simpler prepositions, indicating the common relations of place and time, such as *in, of, at, by*, the simpler prepositions I say, for many of the so-called prepositions are fragmentary relics of fuller words. Such, then, may have been what Plato would have called the greek language in its scantiest, most rudimentary, most absolutely necessary stage.

Next followed, in the languages akin to our own, the inflectional stage, a stage in which all the powers of man's intellect must have been given to perfecting, as a means of communication, that language whose origin had hitherto been spontaneous; to the devising of all manner of terminations and modifications of original

words, to express the manifold relations of things and actions to one another; the stage in which were developed all the full systems of verb conjugation, and of noun declension, as we find them in Latin, or richer yet in Greek, more perfect still in Sanscrit; the stage wherein single words are made to convey as full a meaning as possible, commonly known as the Synthetic, or putting together, type of language.

After this followed a reaction, which has left the languages of modern Europe what the bulk of them now are, comparatively bare and destitute of inflections, expressing by separate words as far as possible all those manifold varieties of meaning which changes on single words previously conveyed, a stage whose utter contrast to the foregoing one single example will show as clearly as a hundred. Where a Roman said but one word, *amaverimus*, we must, to express his meaning, use four, and say *we shall have loved*, employing one word *we* for the name of the agent, *shall* to indicate futurity, *have* for the perfect tense, and *loved* to name the action performed. We are not, as you will doubtless observe, perfectly analytic, or picking to pieces in our mode of speech, for we still retain the inflectional *ed*, which, appended at the end of the verb *love*, gives us what we all know as the passive participle.

And corresponding to this loss of inflections, but in time preceding it, is the loss of power of calling forth new words for the expression of new thoughts. The cause of this loss is, I suppose, embodied in the old adage, "familiarity breeds con-tempt;" and the strong feeling which at first coined words in rapid profusion from the mint of thought soon grew cold and in appreciative, and language passed as regards its names into the stage in which we now find it, which we might call the manufacturing stage, when for a new object no *new* name is found, distinct from and unlike the old one, but some modification or combination of the existing word-wealth of the language is formed to meet the exigencies of the case. A couple of instances will show you what I mean. Time was a little before the Christian era, when the cherry was a new tree at Rome, brought from the East. But the Romans did not give to this unknown object a name also hitherto unknown. They asked, "Whence comes it?" And being told from Ceras#s, a town on the Black Sea, they straightway gave it that name, changing only the declension of the word for distinction sake, and so the old name henceforth did double duty for place and fruit. That was a modification; now for an example of a combination. A hundred years, or even less, ago it was a new thing for men to see lines of squared wooden rails laid along a roadway to lessen the friction of the waggon-wheels. What shall this new thing be called 1 It is a way, a road, no doubt of that; let it keep its name, but with a difference—and what difference? Just as, in the case of the cherry-tree, the Romans might have asked, not "Whence came it?" but, "Who brought it?" and their question answered, have bidden it be known henceforth by the name of its acclimatizer; so in this case English people asked, "Whose idea is this?" And finding that the invention was due to Mr. Outram, owner of an extensive colliery, straightway did they diffentiate road or way by the prefix of his name, and the new thing took the name of Outram-way, or Outram-road, which ungrateful posterity, forgetful of its benefactor, and mindful only of its own convenience, has clipt to our modern tramway or tramroad.

I desire to dwell a little on each of the four states of language to which I have thus briefly called your attention, and to bring under your notice some illustrations of each. These I shall endeavour mainly to draw from English and from Latin, with which we are most of us familiar; but, as I cannot altogether confine myself to them, and must occasionally go further afield to languages more or less akin, let me just remind you of the great and completely accomplished feat of the modern science of comparative philology, the establishment of the unity of the Indo-European, Indo-Germanic, or, as they are now more commonly styled, the Aryan languages. Stated as briefly as possible, this means that the Sanscrit, the ancient language of India; the Zend, that of Persia; Greek and Latin; the Slavonian of Russia and Eastern Europe; the High German of Central Europe; the Low-German spoken along the southern shores of the Baltic, in Holland and in England; the Scandinavian of Denmark and Norway, and Sweden and Iceland; and, finally, the Gaelic of Ireland and Scotland with the Welsh of Brittany and Wales, are all but varieties of one tongue originally the same, varying from one another by certain fixed laws, but possessing in common a large stock of phonetic types, or primitive words, and a grammar in all its essential points identical. You will observe that I have omitted from my list such languages as French, Spanish, and Italian, not because they do not belong to the same family, but because they are all a step further removed. All the languages first enumerated, might be styled daughters of one common parent, the Aryan spoken probably about 3000 years before Christ; while the French, and the other so-called Romance languages, are daughters of one of these—the Latin. Of course, the farther back we can go in the history of those languages which I have classified together as Aryan, the more shall we rid ourselves of those changes which time, and the likes or dislikes for particular sounds on the part of the nations using them, have wrought, and we shall see more plainly the simpler laws of divergence from the original type—laws the origin of which is lost in mystery, but the operation of which must have as effectually divided the different Aryan tribes from one another, as the confusion of tongues divided the Babel builders on the plains of Shinar.

I shall take for illustration in its bearing on the original roots of the Aryan languages one of the best known of these laws, one of the widest application, and trace it through a few examples. It is called Grimm's law, after

the great German philologist, who died only a few years ago, who was the first to enounce and establish it.

Your ear will tell you at once that *pa, ba, fa,* that *ta, da, tha,* are similarly related, and that *ka, ga, cha,* are also kindred in the same fashion. The hard aspirate *cha* (though it is still common in German and in Scotch) we have lost in English, and substitute for it usually the simple aspirate *h*. You will also easily understand why the sounds of *pa, ba, fa,* should be called labials, because pronounced entirely by the lips—in Latin *labiæ; ta, da, tha,* dentals, because their sounds are formed by more or less complete contact of the tongue and teeth; and *ka, ga, cha,* gutturals, because they are sounded by the compression of the throat, which in Latin bears the name of *guttur*. And you will, on examining the nature of the sounds, easily comprehend why *pa, ta, ka* (the first of the series in each case) should be called tenues, or thin letters; first, because for sounding them the passage of the breath must be for the briefest possible portion of time wholly arrested, and secondly, because their sound is short and sharp. You may repeat it, you cannot dwell upon it as you can upon other consonant sounds, for instance, the three in each series *fa, tha, cha*—the so-called aspirates, or breathed letters, because in uttering them the emission of the breath is continuous, and the sound, therefore, capable of indefinite prolongation. Intermediate between the two—not so hard as the tenues, not soft and flowing like the aspirates—come the sounds of *ba, da, ga,* called, therefore, medials, as possessing no special peculiarity of utterance, but lying between the two extremes of tenues and spirants.

Now, Grimm's law stated concisely is this :—Where you find a tenuis, *pa, ta, ka*, in Sanscrit, Greek, and Latin, you shall find in German a medial, *ba, da, ga*, and in Gothic, the oldest known type of English, and in English generally, an aspirate, *fa, tha, cha*; and similarly, by what a mathematician would call substitution, if the first group give you a medial, German shall give you an aspirate. English a tenuis; and if the first group give you an aspirate, German shall present a tenuis, English a medial. It would be impossible for me to enter fully into the exemplification and establishment of this law, but I may venture as briefly as possible to put before you some of the commoner familiar words, in which we find its operation beyond a doubt.

Begin with some simple indispensable words—say the definite article or demonstrative *the* in English, with its derivatives, *this* and *that, then* and *there*. What answer to these in German and in Latin? In German a host of words commencing with *d*—to *the*, the feminine *die*; to *then, dann*; to *this, dies*; to *that, das*. Notice this last form particularly. Our English sound of *th*-, which according to the law should in German replace an English *t*, is to a German's organs of speech nearly unpronounceable, I presume because unpleasant; and s or z or even *tz* does duty for it. This you may have observed when in the earlier part of my remarks I quoted the English *sit*, the Latin *sedes*, and the German *sitz* as identical words. And what do you find in Latin for our English *th*-demonstratives? Just what the law bids us expect—a series of words beginning with *t—tot, tam, tum, talis*, and the like.

Take another word, the second singular pronoun so nearly obsolete in our daily speech, *thou*. Everybody knows its corresponding forms—the German *du*, the Latin *tu*. And so again, the English *three* recurs in German as *drei*, in Latin as *tri*, familiar to us as a prefix in such words as *triple*—the exact equivalent in meaning and in letters of our English threefold; for Latin *p* should by analogy be English *f*. And what cognate forms do you find for our numeral *two*, where the *w*, though not now sounded, must once have been pronounced as it still is in *twilight*—the light *between* day and night? In German, for the initial tenuis *t*, the law bids us look for the aspirate, *th*; in Latin for the medial *d*; and what do we find? In German, *zwei—z* replacing the impracticable *th*; in Latin, *duo*, well known to us all in *dual, duel*, or *duet*; and in the verb, *doubt*, which we have borrowed from Latin. For what means *doubting, dubitating*, to which corresponds in meaning and in etymology the German *zweifeln?* Merely this, not to know which of two ways to take—or, as we say in humble phrase, to be in two minds.

Before quitting these exemplifications of the law from dental letters, there is one root or type to which I should like for a moment to call your attention, which in Latin appears as *ter*, signifying to rub or to wear, the participle of which has become an English word, as when we speak of a trite saying, meaning one well worn and familiar—rubbed, as coin is in its passage from hand to hand. This root is interesting to us, as showing how gradually the meanings of words change. What is the effect of rubbing, if continued? why, a hole! And hence this root has taken in Greek almost universally the sense of piercing instead of that of rubbing, whence we have the name of the boring-worm, so destructive to wooden piles in Australian seas—the teredo or the piercer. Nor is this unknown in Latin, for there we find the word *ter-ebrum*, a gimlet, a boring instrument. Similarly the root claims acquaintance with us in German, as the prepo- sition *durch*, own cousin and representative of our English *through*,; or again as the German *dorn*, the English *thorn*—the piercer. Nor have we yet ended with it among our homely words; from it come directly the verb to thrust, found in its true sense in the New Testament words, "shall be stoned or *thrust* through with a dart;" and the noun, a "thrill"—a sudden feeling—piercing as it were through the heart. Indeed, as Archbishop Trench pointed out long ago in his admirable *Study of Words*, this very word occurs daily to us in its original signification of a *hole*. For what is *nostril* in olden English? Why, *nose thrill*—the passage pierced in the *nose*, where, by virtue of another phonetic law, which we shall

presently recognize, the aspirate sound of *th-* has been changed to *t* by the contact of the sharp *s*.

At the risk of *boring* you with this root *ter*, I must ask you to follow its development one step further. Set to work to rub, and see what form of motion your hand will almost certainly assume—a rotary one, and hence it is that in Greek and in Latin the root finds another expansion into greek or *torqueo*, to turn or twist. From the former of this we have the well-known word *tropics*—the places where the sun seems to pause and turn back in his gradual daily northing or southing, as the case may be. From the latter we have the Latin *torqueo*; the Irish *torque*, the twisted collar of gold; and the *torch*—the twisted rope which, smeared with pitch, served to light in olden days; the *retort*, whether it be the argument which, flung at you, you twist back against your antagonist, or the twisted, bent alembic that the chemist uses; and finally the tortuous course of a river like our Yarra.

Leaving the dentals, let us look for an example or two of our canon among the simple roots involving labials. First meets us the English *off*, the German *ab*, what should be its Greek or Latin analogue? *Ap*—but *ap* it is not in Greek or Latin, for here we come across a law of euphony common to the two tongues. No word in either language terminates in *p*. Therefore, in Greek, the objectionable final sound is disguised by the addition of a light vowel, and the word becomes greek, familiar to us in *apostrophe, apology*, and many another adopted alien; while in Latin, the *p* is softened down to the gentler *b*, and the result is *ab*, well known to us in *abuse, abhor*, and numerous other borrowings from the tongue of ancient Rome. Or again, *pro* is our English *fore, primus* almost exactly our *former; pleo* is the Latin for I *fill*—give but the English of the word, and you see the law fulfilled at once; and as secondary forms of this root, with the notion of number or multitude, we have the Latin *plebs* (the common people), the German *volk*, and our own *folk*, in which the *l*, though unpronounced, bears silent witness to the origin and meaning of the word. Another wide-spread root is *pa*, meaning in Greek and Latin to *feed*, and familiar to us in its derivatives *pastor* and *pasture*, the feeder and the feeding-ground. Does no more familiar word, however, arise at once to our thoughts as connected therewith? Surely yes, the Latin *pater*, our English father; no other etymology can be assigned to either—the father is the feeder, he who is bound to give food to those who owe their being to him. Another derivative from it in Latin is *pecus*, cattle, literally the feeding or grazing thing, whereto corresponds letter for letter the old English word *feoh*, cattle, now obsolete and surviving only in the name of the *fee* paid to the barrister; strange testimony to that older state of society, when payments were made, not in money, but kind.

Before leaving this great law of letter change, I may, per-haps, without wishing to multiply instances, merely indicate one or two more examples of its operation. The English verb *to bear*, corresponds in meaning and root to the Latin *fero*, seen in our *prefer, confer*, or *infer*; our *heart* corresponds to the *cor*, which we know in *cordial*, the synonym of hearty; *kin* to the Latin *genus*, in which we usually soften the initial letter, genus, and whence we derive general and generic, of or belonging to a class or kind; and, finally, our thunder exactly reproduces the German *donner*, and the Latin *tonitru*.

I will ask you now to consider a few roots or phonetic types in which the letters are such as not to be subject to the law of change above quoted and exemplified, or in which some cross law has prevented its operating.

To begin with, suppose I ask you why a shoe was called a shoe?—something to do with the foot, I imagine, would be your not unnatural reply. And I fancy you will smile when I aver to you that the word is of the same etymology and all but identical in meaning with the name of the heaven that bends above us—the sky. And yet a little consideration may make this plain. First, a shoe does not necessarily mean aught connected with the foot, for in German *handschuh* is to this day, a glove; a hand what? hand-covering, one would naturally reply. Now according to a universal law of word evolution in modern English, *shoe* represents an old form *scô*. Turn up your so-called Anglo-Saxon dictionary, the dictionary that gives you the English that Alfred spoke and wrote, and there you will find the form I have just given you, *scô*. Now you see both form of word and supposed meaning are tending to reconcile our seeming widely-parted *shoe* and *sky*. But you shall have a little more evidence. The root *sku* must have meant originally to cover or to hide; for take its obvious derivatives and examine them. greek is the Greek for *skin* (you see there can be no letter change of the *k* by reason of the sharp preceding *s*), and what is that but our body covering? greek is your English shade, or older *scadu*, and what is that but a screen from the blazing rays or a covert from the sun? *Scild* is the primitive of your modern shield, and what is that but a protection from the sword or the arrow? And what, finally, is the sky but *the* great covering spread over His earth by the Almighty, who covereth Himself with light as with a garment, who stretcheth out the heavens like a curtain? May I claim to have proved my case, and shown how the imagination of man, seeing likenesses in things apparently dissimilar, has given names of like import to the poor buskin that we trample under foot, and to the blue dome of air that arches inimitably over-head?

I must content myself with shortly noticing two common roots in which the letters not coming under Grimm's law remain alike in all the Aryan languages. The first shall be the pronoun *me*. This one word, identical in all, and of such a kind that we cannot imagine its being borrowed from one section by another, would, if it stood alone, go far to prove the original unity of the Aryan family. And the second shall be the root

man, to think, found in Greek in greek usually signifying might, for *thought* is *might*. In Latin, *mens, mentis*, whence our adjective mental; in *memini*, I have called to mind, whence our *reminiscence*; next in our substantive *mind*; and last, not least, in the title we give to ourselves, *"man"* the thinker. A noble name is this, to which all the Germanic peoples have cloven as the appellation of their race, a name that bids us look up to Him who gave us thought and being—far nobler than the Latin *homo*, which, if the usually accepted derivation be correct, bids us look down to the *humus*, the dust of the earth out of which we *were* made, but to which we shall not wholly return.

And now for a brief glance upon the synthetic stage of language in which, out of type forms, modified words took their rise, in which inflections and all we commonly call the accidence of language began. Think what an enormous step was taken when first it entered into the mind of man to express plurality, more-than-one-ness, by some termination to be appended to *all substantives* alike, in place of prefixing some vague numeral like *many*. It does not matter if the termination so appended was originally a fragment of an independent word; the great stride was in reducing it to a symbol. Or, again, consider how all the precision of thought was assisted by the terminations of cases such as we find them in Latin, Greek, or Sanscrit. Try and imagine a state of language in which such a combination of words as *man house is* might have left you doubtful whether the meaning was, the house is belonging to the man, the house is for the man, the man's house exists, the man is in the house. All these varieties, save the third, we now distinguish by prepositions, our substitute for cases; but Greek could effect them all by the use of its cases. Again, reflect what a device for conciseness was that which all the older Aryan languages present to us, the appending of pronouns in the nominative cases at the end of the verb. Think what a relief it would be to me, or any other person addressing an audience, if, instead of the capital *I*, which it has been so often necessary for me to employ, my personality could have disguised itself under a harmless long # at the end of all my verbs, as in Latin and in Greek.

But the inventive faculty of man seems to me even more strongly evidenced in derivation, than in inflection. For you can dispense with inflections, or at all events we have dispensed with most that have been current, have tried them and found them unnecessary; or, more correctly, have found that some not too awkward periphrases might replace them. There is no doubt that our language has thus lost both in gravity and in terseness. You cannot adequately render a good piece of Greek or of Latin, without employing more words than you find in the original; and in spite of the abundance of our monosyllabic words, I doubt if you could do it in as few words, or as few letters. But the fact remains, we can do and are doing without many inflections once current; we have dispensed with scarce any modes of derivation; on the contrary, in addition to our own native forms, we have borrowed many from Latin and from Greek.

We saw earlier that, in all probability, verbs, nouns, and adjectives were alike portions of the most primeval speech. By the process of derivation, I mean the systematic formation of one or other of these classes from any one before existing. The Latin *facio, factor*; the English *do, doer*, will at once make this plain. Here the starting-point is a verb, and a symbol is invented, which may be put on to any verb whatever, and shall make out of it a name for the man who does the action which that verb names. Or, again, consider *verus, Veritas; true, truth*. Here you have another symbol, which marks not merely an advance in expression, but a vast onward step in *thought*. For the adjective was but the name of an object; here you have a name of something you cannot see at all, but which you have in your thought created, and imagined as existing in the object to which you heretofore applied the adjective. We shall not, therefore, be surprised to discover, what the history of language and its formation teaches us, that few, if any, of *abstract names of qualities* are *original roots*, or phonetic types, to revert to Professor Müller's word. They are constantly based upon either nouns or adjectives, or even upon verbs, by the addition of some termination which usually is a modification of the third personal pronoun, the demonstrative *t* in Latin, *th* in English, giving that-ness or outward existence to this, our mind's creation. But you must not imagine that derivation is confined to the addition of one such termination to a primitive root; the superposition of such terminations may go on as long as the mind finds it not inconvenient to think up to the complex notion so formed. Let us take a sample or two at random. Our English *truthfulness*. Well, here we start with an adjective *true*, meaning literally hard or firm, cognate with the Latin *durus*, hard, the Greek greek and the English *tree*. Append to this *th*, and you have the name of a quality, truth. Compound the adjective *full*, and you revert to a name applicable to a person filled with the quality *truth*. Now add the symbol *ness*, and you construct again an abstract noun, signifying, originally, the outward semblance, but it may be also the very inward state or quality of the truthful man. Or take a Latin example—*impecuniosus*, our English *impecunious*. Here we start with our old friend; *pecus*, cattle; thence we advance to *pecunia*, the state of possessing cattle, or, briefly, *wealth*; then onward to *pecuniosus*, full of the state of cattle owning, or wealthy; and, finally, we negative this, namely, prefixing *im*, the symbol of negation, and make our name into not-wealthy or poor. I must have one Greek example for you, for the sake of the singular change the word has undergone. You all know what an *alms* is; possibly you do not know the history of the word. To commence, there is a Greek word, greek meaning pity. Thence was formed a verb, greek I pity; thence an adjective, greek pitiful; and thence,

finally, greekgreek pitifulness. But, forasmuch as pitifulness is not pitifulness unless manifested in act, this word easily passed into the signification of money given for the poor; and in this sense was adopted by the early Christian Church. Thus become the name of a duty, it spread with the spread of Christianity, and was carried with it far and wide. In point of fact it exists in our English of to-day, with a Latin termination tacked on to it, in the hideous word *eleemosynary*, which we do occasionally see. However, as each nation adopted it, they knocked the cumbrous word into shape to their own liking; the German made it *almosen*, the Frenchman *aumone*, softening out both *l* and *s*, and our English forefathers abbreviated it to *ælmesse*, which Scotland has yet further cut down to an *awmous*, England to *alms*.

Modern English, in this matter of forming new words by derivation, is very potent. We have not only retained most of our own formative terminations, but we have drawn largely on Latin, two have been just used, *ive* and *ation*; and even upon Greek, as when the other day, with true recklessness about hybridism or the mixing of words and forms coming from different languages, we, desiring a new name for a new act, took the quasi-Greek word *climate*, stuck in front of it the Latin *ad*, and at the end of it the Greek greek and developed the verb acclimatize. Not a bad or a useless word, for see how very complex an idea it conveys. How shall we phrase it? To adapt to a given climate natural productions which were not previously found in it. Will that do? Nearly, I think, but, considering the length of this, we ought to be much obliged to the man who invented one word to express it all. But not content with his good work we must append, further, the pure English *er*, in the place of the legitimate Greek *ist*, to denote the doer; and then, by way of variety, select the Latin termination *ation*, for the name of the deed when done.

It remains that I should say a few words on the wear to which words are subjected in their passage down the stream of time, such as may have been observed in our puny *alms*, small relic of the rolling Greek greek. Changes in the form of words are usually traceable to one or other of three causes :—1. The inability of some people to utter a particular sound. 2. Their dislike to some particular collocation of sounds, or generally a love for euphony. 3. A desire for contraction, or, what is much the same, more rapid enunciation. Perhaps all the three might be reduced to one—laziness; for as to the first cause, it is certain that there are very few sounds in any language which you could not teach every child to pronounce; as to the second, our idea of euphony is little beyond that which is easily said, and therefore we like to say; and the third is undoubtedly laziness, pure and simple. But the three will at all events serve as a basis for classification. As regards inability to utter particular sounds, we English folk suffer very little from that. Among all the Aryan languages, the Sanscrit is in its system of sounds the fullest, and next to it I should be disposed to place our own. Of almost all the modern nations of Europe we alone can utter distinctly both *v* and *w*, can distinguish between *vine* and *wine*, and we alone have the complete system of palatal sounds. One important sound however we lack, the *X*, the guttural aspirate. From the dislike to this, which has developed into inability to utter it, has resulted that great standing anomaly, the varying pronunciation of the terminal *gh* which gives foreigners such annoyance. But a Latin could as little articulate *X* as an ordinary Englishman; and besides this he could not utter # at all. And so our good English verb *to greet* looks as if it were derived from the Latin *gratus*, acceptable. It is the same word, but not because of its similarity, but in spite of it. For the root in Latin ought to have commenced with *X* as it does in Greek, as we know from the word Eucharist; but failing the *X*, the Romans used their nearest sound, the hard *g*. Again, you might have expected the English *deer* to have found its equivalent in Latin, as it does in Greek, in a word commencing with *th*. But given *th* impossible, what were the Romans to do? Much what we did in the case of *enough, draught*, and other such words; they took the nearest aspirate, *f*, and accordingly the Latin analogue to our *deer* is *feræ, untamed creatures* generally, whence, ultimately, our *fierce* and *ferocious*.

The dislike to particular combinations of sounds is very strongly marked in all nations, but is peculiarly dissimilar. For instance, if in Greek a dental sound and a guttural came together, they must be made precisely alike in character. The familiar English word *practice*, which is Greek in origin, will illustrate what I mean. The *k* sound which precedes the *t* ought to have been a hard *g*, but was modified to suit the following tenuis. But our English forefathers had a positive hatred of two aspirants coming together, a collocation of sounds in which a Greek's ear would have delighted, and hence you will discover in English anomalies in the formation of derivatives. For instance, *long* gives *length*, and *strong, strength*, but *high* gives not *heighth* but *height*. So *till* gives you *tilth*, but from *give* is derived *gift*, from *thieve, theft*, and the *k* of *think* and the old *y* of *may* were changed in the derived substantives into *gh*, the aspirate in *thought* and *might*.

To the third cause, however, the great change in the forms of words is mainly due in our own as in other tongues, and it has taken effect mainly in the gutturals, which are after all the hardest and most troublesome letters to sound. What has become of the *k* and the *g* which are still written in *know, knee, gnome, apophthegm*, and *phlegm?* What of the *h* which once preceded *ring* and *raw*, the loss in the latter word concealing its identity with the Latin *crudus*, our *crude?* I pointed out to you, in the instance of the word *shoe*, that nearly all our words commencing with *sh, shall, share, shape, shell*, and many more, had all once an initial *sk*. Try the difference in time between saying *skip* and *ship*, and you will recognise at once the cause of the change.

Similarly, nearly all our words now commencing with *ch* originally began with a *k* sound, and this whether English pure or Latin adopted through French; *churl* is the old English *ceorl* as surely as *charm* is the Latin *carmen*. Nor is it at the beginning only of words that the gutturals have suffered this maltreatment; they have fared as ill at the end. All our adjectives that end in *y* once ended in *ig*; our adverbial termination *ly* was once *like* at full length; *hedge* was once *hage; edge* once *eg*, as you see it in the name *Egbert*, the bright *edge*, or in the verb to *egg* a man on, to whet or sharpen him. Nor are the gutturals the only class of letters which our desire for speed has crushed. No one now says *n#ti#n*, bnt *n#sh#n*; and some years ago it appeared as if *picture* and *nature* were to become in English *piktcher* and *nacher*. The great spread of education, and the fixing thereby of our standard of speech, has done much to arrest this tendency in our language, and probably we may now consider the pronunciation of English as approximately fixed and permanent.

My task is done, I know too well how imperfectly, and I much regret the haste with which I have been driven to pen my few remarks. My object is attained if I have excited in any of my hearers some desire to give heed to language, not alone for what it conveys to us, but for the thing it is in itself; and to note how the purpose of man has, half unconsciously it may be, yet still intelligently, been shaping this wondrous gift of God to him. Language is but words, words are but human breath; and yet the language and the words live on independent of those who first gave them being, and those in whose mouths they live again from century to century. Well for us if we remember that not only the language of a nation thus has life, but that to the words of each of us is given the like abiding permanence; for one day out of our words shall we be justified, or out of our words condemned.

The Objects of a Botanic Garden in Relation to Industries.

A Lecture, DELIVERED BY Baron Ferd. Von Mueller, C.M.G., M.D., PH.D., F.R.S.
(Government Botanist for Victoria, and Director of the Botanic Garden of Melbourne),
On 23rd November, 1871.

"Avoid extremes."

IT was originally my intention to limit the lecture, promised for this evening, to an explanation of the bearings of botanic gardens to industrial pursuits; but I found occasion to overstep these precincts, to bring the many other objects of a true botanic garden also, at least briefly, under the view of this audience. The ideas of most people in reference to the meaning and duties of institutions of this kind seem so vague and imperfect, that it may be advisable to trace the early origin of such gardens, and to see likewise how far their legitimate functions are generally recognised at the present day; further-more how far, as institutions framed for distinct purposes, they are able to exercise a vivid and powerful influence on education, on technology, on rural pursuits, and on the advancement of independent researches for the enlargement of phytologic knowledge.

The original and ancient appellation of "botanic garden" is hardly any longer applicable in the strict sense of the word, implying a garden for medicinal or otherwise useful herbs, inasmuch as the scope of establishments so named has become vastly extended; moreover, many of the numerous local gardens passing under this name, particularly in these colonies, have no claims whatever to such a designation.

NOTE.—*The Lecture was illustrated by a large number of growing Plants of industrial value, also by numerous Products and Educts derived therefrom, as well as by various Museum Plants, Physiognomic Pictures of Vegetation and other Drawings*.

If much inconvenience was not involved by the alteration of the term, it would be recommendable to recognise the true botanic gardens of this age as scientific gardens; while all those institutions, in which no real phytologic researches are carried out, or in which the main aim does not consist in affording instruction, might well be called public pleasure gardens, or perhaps recreation grounds or parks, according to the design for which they are created, or in consonance with the requirements for which they are maintained.

Let us now see how botanic gardens first originated.

The study of plants in Europe arose with the glorious genius of ancient Greece, the earliest historic records in Sanskrit, or the ancient discoveries of the Chinese, being yet wrapped in almost complete obscurity, particularly as far as plants are concerned. The Greeks and Romans sought chiefly knowledge of plants, which were available for medicine, rural economy, or the work of their artisans; the number of such plants in those dawning days of knowledge, while the range of commerce was yet so restricted, being necessarily quite limited. Hippocrates was acquainted with 236 different plants in use at his time (460-351 B.C.). Tyrtamus Eresos, or Theophrastos, as this favourite disciple of Plato and Aristoteles is usually called, records 455 in his writings, some not indigenous to Greece (370-288 B.c.); his knowledge being largely imbibed from the teachings of his

masters, who must be regarded as the founders of botany as a science, just as many other branches of knowledge owe their origin to these great philosophers. Diogenes Laertios informs us, that Theophrastos and his pupil Demetrius Phalerius, who for ten years was Regent of Athens, possessed a garden, containing as well exotic as indigenous plants, in which he assembled his disciples. This has been considered by some, Cuvier among others, as the first attempt at a botanic garden, and doubtless it was here that Theophrastos instituted many of his numerous observations. Only with the renewed brighter dawning of knowledge in Western Europe, his works became there accessible in the fifteenth century, when a Greek refugee, Theodore Gaza, was induced by Pope Nicholas V. to translate into Latin various of the writings of Aristoteles, the *Aphorisms* of Hippocrates, and also Theophrastos' *Natural History of Plants*. Gaza died in Rome in 1478, and the translation appeared first at Trevisa in 1483. The work contains notes on the structure, habits, properties and modes of propagation of plants, and enumerates, to a certain extent, the species considered utilitarian at that remote time. Many of these results must have been obtained in Theophrastos' garden. Two other disciples of Aristoteles, Phamias Eresios and Dikaarchos of Messene, and a third, whose name remained unknown, have handed over to us by their writings the views entertained by their teacher and themselves on the nature and properties of plants, as recognised in those distant days; but we have no record of their possessing special scientific gardens.

From the time when the political preponderance of Athens was sinking, dates also the decay of learning, once eminent among her citizens. Instead of Athens, for a considerable time Alexandria became the seat of sciences and arts, carried thither principally by Greek emigrants; and mental culture flourished there under the protection of the Ptolemaian Kings of Egypt, amidst the horrors and cruelties of that age. Under the wise reign of Ptolemæus Philadelphus (285-247 before Christ) the Museum and Library were founded, the latter then already containing 400,000 rolls. But although Alexandria shone like a sun in the constellation of lesser stars in regard to learning and civilisation, yet wherever Hellenes became scattered they carried with them their love of science; and it was especially the flourishing town of Pergamos, on the Black Sea, which distinguished itself by scientific eminence in that early period. Besides an extensive library, King Attalus Philometer (died 133 years before Christ) established a garden for poison plants and their antidotes, and for the same purpose a garden was formed during the reign of Mithridates Eupater, of Pontus (136-63 years before Christ), while the patronage of these sovereigns was enjoyed by the two most celebrated rhizotomists of that time, Kratenas and the physician and linguist Nikander of Colophon.

Dioskorides, at the beginning of the Christian era, extended much these early researches, more particularly in regard to medicinal plants; and his work and that of Plinius continued for nearly seventeen centuries the codex of medico-botanic science, it being rich in observations gathered by the former while surgeon to the Roman legions, and it is consulted yet as an authority in the Orient. Dioskorides' work, as well as the writings of Aristoteles and Theophrastos, contributed much to the *Historia Naturalis* of the elder Plinius, who was so famed as an admiral, statesman and philosopher (23-79 A.D.). Plinius mentions that Antonius Castor, under King Dejotorus of Armenia, possessed a botanic garden at the time of Julius Cæsar.

From the famed surgeon Galenus of Pergamus, who much recommended the study of native medicinal plants, we have to pass through a long interval of comparative scientific darkness, in which phytology particularly shared. Useful plants were, however, in many instances cultivated by the monks. The medical knowledge of the Arabs was carried through the crusades to the Occident, and thereby new information of many plants was secured. The Benedictines, in 1309, formed, with the medical school of Salerno, also a medical garden. In 1333, the botanic garden of Venice was established as an institution accessible to the public. Lucas Ghini formed successively the botanic gardens of Padua and Pisa in the first half of the sixteenth century. About that time also such institutions were organised at the Universities of Bologna and Pavia. Duke Alfons of Este formed one at Ferrara. Belleval was instrumental in the formation of the botanic garden at Montpellier, early in the seventeenth century. All these South European institutions are still in existence, and with most of them the one of our young colony continues in communication.

The elder Camerarius, in 1588, described his private garden of Nürnberg (Nuremberg) as "*hortus medicus et philosophicus*." The University of Leyden provided its garden in 1577; that of Paris dates from 1633. Queen Elizabeth created the first in England, at Hampton Court, of which Parkinson was the administrator. Bobardt was the first director of the Oxford garden, in 1632. The Bishop of Eichstedt formed one at St. Wilibald, under Besler, which gave rise to a descriptive work in 1613.

Peter the Great, amidst his enormously active exertions to regenerate his colossal empire, could still find time to create, in 1714, at his new capital, the great botanic garden, which stands now amongst the foremost of all, notwithstanding the inclemency of an inhospitable climate. The Emperor, not unaccustomed to take counsels with philosophers, planned this garden on the advice of Leibnitz. The botanic garden of Edinburgh was already founded 200 years ago. Henry Nicholson gives an account of the plants of the Dublin medical garden in 1712.

But why do I enter on these historical details, many of which are almost buried in oblivion? I did this,

because I wished to demonstrate, that from the early transcendental days of Greece up to the most recent decennia all institutions designated as botanic gardens were mainly or exclusively devoted to the rearing of such plants as were adopted for medicine, for alimentary or industrial purposes; and it would be little short of relapsing into barbarism, were we to alienate any such institutions of ours entirely from their legitimate purpose.

By way of illustration let me offer a few words on recent eminent institutions of this kind. As one of the most important of all botanic gardens of the European continent, may be instanced that of Breslau, founded in 1811, and since 1852 under the direction of my venerable friend, Professor Goeppert, who conducts his administration in accordance with the highest principles of science. I am not aware of the precise present contents of that rich establishment, but already in 1857 it possessed about 3000 annuals, 4000 hardy

The latitude is that of London, but the climate is much colder.

perennial herbaceous plants, about 2000 species and varieties of unprotected shrubs and trees, and about 3000 different kinds of plants under glass. This garden is remarkable for its physiognomic groups, of which there are 84, and to augment these the tropical plants are placed from May till September in the open air. Unique in the Breslau establishment is the display of fossil plants, restored from original specimens, to exhibit them not merely fragmentary, but as much as possible in their pristine completeness. Carpologic collections are made from the living plants with the most circumspect and scrupulous care. The botanic garden of Munich was founded in 1809, at a time when the horrors of apparently endless wars concussed the whole of Europe; it was long under the surveillance of the deeply-learned philosopher and celebrated Brazilian explorer, Yon Martius, whose memory must be dear to every one who was brought in communication with that great man. This garden contained in 1851, in its conservatories alone, about 5000 species of tender plants.

If necessary, I might enter on long expositions concerning the workings and contents of the principal botanic gardens of former times or the present days; but I will rather at once define the conclusions, to which all these statistics or other comparisons would lead us, only yet premising, that among all existing state gardens none can be compared to the grand and justly-famed establishment of Kew. While the highest scientific administration is there brought to bear, it is also seconded by the enlightened and commensurate support and the princely endowments of a great nation.

The objects of a botanic garden must necessarily be multifarious, nor need they be, in all instances, precisely the same; they may be essentially modified by particular circumstances and local requirements, yet, in all cases, the objects must be mainly scientific and predominently instructive. As an universal rule, it is primarily the aim of such an institution to bring together with its available means the greatest possible number of select plants from all the different parts of the globe; and this is done to utilise them for easy public inspection, to arrange them in their impressive living forms, for systematic, geographic, medical, technical or economic information, and to render them extensively accessible for original observations and careful records. By these means, not only the knowledge of plants in all its branches is to be advanced through local independent researches, conducted in a real spirit of science, but also phytologic instruction is to be diffused to the widest extent; while simultaneously, by the introduction of novel utilitarian species, local industries are to be extended, or new resources to be originated; and, further, it is an aim to excite thereby a due interest in the general study and ample utilisation of any living forms of vegetation, or of important substances derived therefrom.

All other objects are secondary, or the institution ceases to be a real garden of science. But the detail interpretation of these fundamental rules may be more or less rigorous, as the extent of the operations thus designed must very largely depend on the natural facilities and monetary means which are at command for the purpose. Moreover, the early attainment of any of these varied objects must evidently be all the more difficult in a new country, where in the first generation we are passing yet through the laborious and expensive process of founding all those institutions, from which in the natural course of events a later time can only derive the fullest benefit. But in all these planting operations indicated for scientific demonstration we can still find full scope for the display of tasteful ornamentation and picturesque grandeur.

A real botanic garden, then, ought to display the living vegetation in its multifarious forms as far as ever local circum-stances will permit. All the plants of the globe build up together a great harmonious system in nature; they are all referable to distinct specific forms, all created by design of an Almighty power for special purposes; they are, moreover, all endowed with well-defined qualities, all interesting and beautiful in themselves, and eligible for our varied wants. We may accumulate collections still more extensive for our phytologic museums than for our garden displays; but we still need to study, as far as we can, the forms of the vegetable empire in their living freshness, their natural grace and vital beauty. What can be more instructive than to compare allied species, from often widely distant parts of the globe, when placed in culture side by side? Or, what can be more impressive than to watch how in succession the specifically ever-unalterable forms unfold themselves before our view or sink again into rest? To accomplish great results in all these respects we

have in our climatic zone enviable facilities; and thus horticultural pursuits for strictly scientific purposes become also here far more grateful than in the countries of colder climates where most of us spent our youth. Remember only how, irrespective of the plants of colder latitudes, we can have under the open sky around us the plants of all the Mediterranean countries, Arabia, Persia, the warmer Himalayan regions, China and Japan; how we can rear here without protection the marvellously rich and varied vegetation of South Africa; how in our isothermal zone we can bring together the plants of California, New Mexico, Florida and other southern states of the American union; and how we need no conservatories for most of the plants of Chili, the Argentine State and South Brazil. In Australia we require hardly to allude to the singularly peculiar vegetation of New Zealand, or the gay, curious and remarkably varied vegetation of West Australia, because we are rightly accustomed to regard these neighbouring colonies as portions of the great integral southern empire of Britain; but it requires to have studied the vegetation of Australia and New Zealand specially to appreciate its richness, and to understand fully its value for a garden in a colony like Victoria.

Thus, for geographic and for systematic culture, both primary objects of a botanic garden, singular facilities arise to us here, and this I cannot better demonstrate than by some exemplification. South Africa possesses, for instance (according to Mr. Bentham's elaboration, issued by the elder De Candolle in 1839), about 400 real Ericas, many so long the charm of European greenhouses, and there are about 100 more of Cape Heaths, though not true Ericas. Collateral to the Cape Heaths, and not less handsome, are our own Epacrideæ, with about 200 Styphelias and generically allied bushes, and again 70 capsular species of Epacris or cognate genera. Professor Harvey and Dr. Sonder, in their great work on South African plants, describe about 50 Muraltias, 70 Hermannias, over 100 species of Oxalis, about 150 species of Aspalathus and at least 150 Everlastings; among the latter alone 137 veritable Helichrysums. The Australian Immortelles, largely from the West Coast, are in some instances still more lovely. They amount to more than 100, among them about 50 Helichrysums and 30 Helipterums. This calculation leaves Everlastings of other orders, such as Ptilotus, Laxmannia, Calectasia, etc., uncounted. Of all these, as yet comparatively very few have found their way into our own gardens, although these plants would need here singularly little care. Still less horticultural attention is essential for the wonderful variety of succulents with which South Africa teems. You may have seen, spring after spring, or summer after summer, the gayness of at least a few species of Mesembryanthemum, unfolding under the sun of our clear sky a dazzling brilliancy of starry flowers, on which the eye is almost unable to rest. Of these Mesembryanthema nearly 300 species exist in South Africa, mere varieties uncounted. But the array of succulents does not end with them. There are also a quarter of a hundred of Cotyledons, no less than 100 Crassulas, more than 100 Stapelias, about 160 kinds of Aloe, several Kleinias, Cactus-like Euphorbias, and a good many others, all highly desirable for scientific garden collections, some quite paradoxical. Thus, South Africa alone gives us nearly a thousand succulents, many, I fear, under the progress of settlement doomed to absolute annihilation. When speaking of succulents, hardy here, I do not comprehend among them the generality of Cacteæ;, of which it is assumed, that about a thousand kinds occur, all with one exception American, mostly however intra-tropical; yet also many of these do not demand protection under our sky.

I cannot extend these details much, but our means of communicating with the Cape of Good Hope are seemingly on the increase, and so our facilities of acquiring; more particularly since Her Majesty's representative will now also prove a dispenser of generosity from thence. I may, just in passing, remind you of the existence of sixty Phylicas, nearly as many Asters, Sphenogynes and Athanasias, and three times as many Senecios (the latter including the pretty S. elegans), none of all these coming amiss to a botanic garden. There are over 100 Indigoferas, many of them very handsome plants, in South Africa, none, I believe, ever subjected to the trial whether pigment can be obtained from them.

A search for dye in our native Indigofera gave negative results. We know, in all, about 250 Indigoferæ, none European.

There are many Podalyrias and other leguminous bushes, which a horticulturist here may well covet, when we see how much the few species hitherto introduced already contribute to the spring-glory of our gardens, and how completely they are able to cope with the vicissitudes of our climate. As for bulbs, they also attain their maximum in South Africa; this a glance at the bulbous flowers of any garden will testify; but we know little yet of the Lilies and numerous other flowers of California and Texas, in a horticultural point of view—many modest, it is true. New trans-pacific communication has lately brought these with their floral companions also within our easy reach. The heath-like Diosmeæ of South Africa, all charming bushes, number (according to Dr. Sonder's disquisition) 170; Agathosma alone counts 97 species, of which hardly any yet are existing here. These pretty plants, which cannot sustain themselves out of doors in the inclement northern countries of Europe, we surely should like to grow here, along with our Australian diosmeous Rutaceæ, in gay array, for pleasing contrast, or systematic and geographic comparison. If we also add the superb Australian Diosmeæ (Boronia and Zieria 67, Eriostemon and allied genera 66), we obtain over 300 kinds of this admirable tribe of plants to select from.

The Proteaceæ; of Australia and Africa might also be con-sidered together, as they belong to the same climatic regions, and might here be reared alongside of each other. Professor Meissner admits nearly 250 South African Proteaceæ;, among them about 60 Proteas, 50 Serrurias and 50 Leucodendrons, the latter including the Silvertree of the Cape. Undoubtedly this is a remarkable wealth of Proteaceæ;, an order now only occurring in fossil forms in any part of Europe; but, through my aid, and in sequence of prior researches (chiefly of R. Brown and Meissner), it has latterly been shown by Bentham that Australia is still richer in these plants, as it can pride itself on no less than 576 Proteaceæ, among which Banksia and Dryandra united count 93 species, Petrophila and Isopogon together 64, Persoonia 59, Hakea 95, and the genus Grevillea, which is familiar to all of you, 156 species; 30 Grevilleas having been added by my independent researches, instituted chiefly in the Melbourne Botanic Garden. Is it not of far greater instructiveness and importance, to secure as many of these mostly rare and local plants for a true botanic garden, than to spend the same amount of exertions and outlay on numerous varieties of ordinary florists' plants, which almost every private garden already possesses? Is it not far more worthy of the objects of a botanic garden, to gather for instance the 143 pretty Heath Myrtles, chiefly of West Australia, which in their simple beauty cannot be surpassed, than to strive incessantly to add hybrid flowers to those on our garden plots, or to acquire some probably unmeaning new varieties, however delightful to the eye, yet perhaps only slightly larger or tinged rather differently to those which we had before? Let us, according to our means, extend our patronage to all that is brilliant as a mere flower, but not to the exclusion of grander aims. Of the charming Darwinia we might secure 23, some most exquisite; of Verticordia 37, of Calycothrix 34, of Thryptomene and other Heath Myrtles 49. This brings me to the allied Baeckeas with 54 species, the splendid Calothamni and Beaufortias both together 45 species, Melaleuca and Callistemon 107 species, Leptospermum, Kunzea and allied genera with 57 species. Numerous of the Heath Myrtles found their first elucidation in the Botanic Garden of this city. But be it well understood, that I do not wish altogether to discard the gorgeous acquisitions, which we owe to patient horticultural skill, even in a botanic garden. Let me, as an instance of phytologic requirements in this respect, adduce the genus Pelargonium. Its hybrid forms are now uncountable, and I should be sorry to banish these gaudy plants; still 160 specifically distinguishable Pelargonia exist in South Africa, their main geographic area, and I should sadly regret if the pure original and at the same time attractive and lovely forms of the genus, from which the garden hybrids all gradually sprung, were to be entirely superseded in preference to the latter.

"First follow nature, and your judgment frame
By her just standard, which remains the same.
Unerring nature is divinely bright,
One clear, unchanged and universal light;
Life, force and beauty must to all impart
At once the source, the end, the test of art."

—POPE.

But is it necessary to dwell on all this so long, when the bearings of botanic gardens on industrial pursuits are mainly to engage our attention for this hour? It is, because a great multitude of foreign plants, never yet introduced, or not yet generally recognised as valuable, might be made subservient to horticultural and other industries. A rich assemblage of rare plants becomes a great treasure in our climate simply by the yield of seeds; or by affording the means for multiplication by cuttings or otherwise, the yield to become thus readily available for horticultural trade here and abroad; while many of the handsome shrubs of our garden-grounds do not produce seeds in the conservatories of colder lands. I fancy, that a square mile or two of heath-ground, well selected, and within easy access of railroads, could in a climate like ours be converted into a place of the utmost attraction and instructiveness, by bringing together and naturalising on such a spot all the gems of the heath vegetation, which South Africa, our own continent, or the moorlands of the Andes, the Himalayas and other countries produce. But not only could such a spot be decorated with the utmost profusion of gaiety and loveliness,

For instance, above 100 species of Sundews could be brought together there.

but it might, as pointed out, become also a source of great pecuniary gain, merely by the annual gathering of seeds from such a mass of rarities. Instruction from a botanic garden assuredly paves the way for purposes like these.

Would it not be of great importance to our artisans to see the 130 species of Eucalyptus, as the principal timber trees of this continent, all represented in a state garden here? About 50 of these were rendered known to science by Melbourne researches. Imagine the glory of some of these trees, when—as in the instance of Eucalyptus miniata—they are loaded with trusses of orange-coloured blossoms; or when, as in the instance of

Eucalyptus phœnicea, a tree of this genus produces crimson flowers vieing with the Ratas of New Zealand, but shows an infinitely easier growth.

We should promote the cognisance of the timber, not merely from museum specimens, but also as much as possible from the living trees. In a young country particularly, our energies should be concentrated on instilling information in this way. But a tree planted during the early days of settlement, if thoughtlessly sacrificed in a moment, or allowed to perish from in acquaintance with its nature or value, cannot be restored to its attained size, even if replanted, before the end of this century.

As yet we know but little of most Oaks, as far as technology is concerned. We should watch their growth in various geologic formations; we should note their adaptability to certain climatic regions. About half-a-hundred kinds have been brought together here by myself, but there are 300 kinds in different parts of the globe to select from. Quercus Lusitanica has shown itself here one of the most eligible for avenues, on account of its rapid growth, its protracted verdure and complete umbrageousness.

A variety of this species yields the nut-galls of commerce.

Our Eucalypts are as eagerly tested and watched elsewhere, as we ought to ascertain the effect of our clime on introduced timber trees. Our Blue Gum-tree will still grow from Toulon to Nice; at Cannes the tender branches are frozen. At Golf Juan the tree does not suffer. It comes within our observations in a scientific garden, why wood is more durable when produced on certain spots, as compared to that of other localities, and in a similar manner should be carried on undisturbed utilitarian research in manifold other directions. One single plant of a tree, once obtained, can become the progenitor of vast plantations. It is no exaggeration when I say, that from a single imported Asiatic Ash 15,000 young trees were obtained by me for Victoria, and that from a solitary Tamarix plant 20,000 bushes, now scattered through our colonial shrubberies, took their origin.

It should be ascertained, how many of the 160 true species of Willows and of their numerous hybrids are available for wickerwork; and we should learn, whether any of the American, the Himalayan or the Japan Osiers are in some respect superior to those in general use. We are aware that the Sal (Shorea robusta) is hardier than the Asian Teak (Tectonia grandis), the latter naturally not thriving beyond the tropic circle; but we are not aware, whether the Sal will live in any sheltered forest clearings of Victoria, and how far the Sisso (Dalbergia Sisso), which is hardier still, and which, according to Colonel A. Crawford, stretches to the 32° N. in the Punjaub, can be adopted as a forest tree for this colony. In solving such questions, a scientific garden may afford material aid. We should like to see how far Californian Red-wood trees (Sequoia gigantea), or New Zealand Totaras, may give us good timber, when merely grown from cuttings in the open air.

Test experiments, initiated from a botanic garden, might teach us whether the Silk Mulberry tree can be successfully reared in the Murray desert, to supplant the Mallee-scrub, or what other utilitarian plants, such as the Fig, various Conifer, Tanners' Wattles

Good Wattle-bark is three times as rich as Oak-bark in tanning principles, and much quicker produced, and that in localities where no oak will thrive.

, grasses, &c., we may gradually establish there.

Numerous Pines and other industrial trees have been secured for this country, not merely in a few specimens, but in large masses. The Nut Pine of Nepal is brought thus at last before you. The King Pine or Dye Pine of the Himalayas I raised by tens of thousands; but even if we had them by hundreds of thousands through our moister and higher ranges, it would not be too much. When even a bundle of firewood on some of our diggings costs already some shillings, the question of timber and fuel becomes also to us one of constantly increasing moment, and thus in a botanic garden we should also give to this grave question some practical and enlightened attention.

As regards deal wood, which naturally not occurs in our ranges, you will be cognisant that within the last few months more was consumed by the flames, raging through many of the forests of Canada and the United States, than would have sufficed to supply Australia for a generation.

Again, I cannot imagine anything more interesting than a full collection of Acacias, of which Australia alone furnishes (Albizzia and its sub-genus Pithecolobium included) 300 species, all hardy here. What delight is experienced, when as the first harbingers of spring the early wattle-flowers burst into bloom, converting bushes or trees almost into one mass of gold, and diffusing fragrance widely through the air. To me 300 Acacias appear far more valuable than 300 varieties of particular fancy flowers, at least in a young botanic garden, where their names, their native countries, and perhaps even the uses of many could be learnt. From the arborescent species of Wattles we might secure, by a judicious selection for copious planting, successively through all seasons masses of flowers along whole tree-lines or copses. Thus our Silver Wattle (Acacia dealbata) early unfolds its flower-trusses on river banks; then follows our Golden Wattle (Acacia pycnantha), to be succeeded by the spreading Willow Wattle (Acacia saligna) from Western Australia, and this in turn gives way to the flowers of the Black Wattle (Acacia decurrens) on our ridges; while the Blackwood tree (Acacia melanoxylon), as well as Acacia implexa, A. penninervis and many others, bloom later in the season, to keep up this imposing and

grateful floral display, while A. retinodes remains ever flowering all the time. But for industrial purposes many of these Acacias become of far more than ordinary interest. Catechu, tanners' bark,

From which a concentrated extract may be prepared.

gum, galls, scents and woods of various qualities are obtained from them; others serve for hedges; but as regards oddness and strange diversity of foliage there is no other genus in the wide range of the vegetable empire which is equally remarkable. The harvest of seeds from such an array of showy plants of easy growth is usually most copious and valuable in itself. For scientific and yet gay aggregation the native genera Pultenæa and Daviesia, both familiar to us here, offer respectively 75 and 55 species; Hibbertia (including Candollea) furnishes over 80; Thomasia with Lasiopetalum together 50. I instance all these as grateful plants, enduring hot winds, and yielding seeds in copiousness for easy growth. Again—Oxylobium, Chorizema and Gastrolobium (if considered together as emanating from one general typic form) amount to 74, all beautiful, and some, especially the West Australian species, quite singular in foliage.

Turning to genera, numerically large in species, from which a botanic garden can copiously select for its conservatories, I might adduce Begonia. Professor Alph. de Candolle defines by his recent masterly essay in the Prodromus, the characteristics, carefully elaborated, of not less than 380 species; how far this number will be augmented, when once the mountain jungles of the whole of tropical Africa shall have been explored, by phytographers or trained collectors, is quite beyond our surmise.

Dr. Hooker has since published 24 new Begoniæ from equinoctial Africa.

Even the infra-alpine regions of New Guinea and Borneo may add considerably to the number, and so perhaps even may yet Begonias be obtained from the unascended Mount Bellenden Ker of North-east Australia, into the jungle fortresses of which, as yet, no breach is cut. If we once possess any of these decorative plants, mostly well adapted for window culture, we can propagate them with the utmost ease, even from a mere leaf. Such plants, irrespective of their geographic interest, are important also, when the functions of a botanic garden towards horticultural industries are to be considered. The cultivator is glad to have fixed the botanic names and to know the respective native countries of the different species, particularly when, as in this case, the genus ranges throughout the tropics of nearly the whole globe.

The epiphytal Orchideæ, which are the glory of all tropical jungles, from whence collectors can bring them away bodily with the greatest ease, are numbered by thousands. In the magnificent Belgian "serres" of Monsieur Linden are brought together already not less than 1200 species of these wonderful plants.

While such a collection is a gem in itself, a reward of circumspect toil and a triumph of superior horticulture, it at all seasons charms even the plain observer, either by the bizarre forms of flowers, or by their gaudy coloration, or by their imitative resemblance, or by their curious mode of attachment, whether to walls, rocks, wickers, fern stems, logs or any other substances.

Such an assemblage affords at all times ample material for original study and designing art, while its contemplation raises the taste and standard of horticulture, and instils an amount of information, which ordinary decorative cultivation fails to convey; indeed, a botanic institution should aspire to these higher aims. Again, to the proprietor, such a collection, by its increase in masses, can also become commercially one of quite a lucrative gain. Hence I allude to this specially in this industrial hall.

Perhaps it is not too much to assert, that every one of the existing ferns is worthy of cultivation. The delicacy and gracefulness of most is proverbial; the rearing of the majority is not surrounded with difficulty, even from almost invisible spores,

Imagine that a fern-tree, possibly as high as the Museum Hall, can be raised from seeds so extremely minute, that millions of them would not weigh an ounce.

while pteridologists have already unfolded the astounding number of 2400 specific forms, numerous varieties uncounted *(vide* Hook, and Bak. *Synops. Filic.)*. Yet recent searches over the small islands of the Samoan group have taught us how greatly this number of known ferns may yet be augmented, when once Central Africa, Borneo, Sumatra, New Guinea, Siam and other tropic countries, widely unexplored, shall have been fully traversed. The Angiopteris presented to you here from North-east Australia extends its single fronds often to a length of 12 feet or even more.

Of Passion Flowers now already 231 are on systematic record, far the greater number from the tropical regions of America.

Dr. Masters, in *Transact. Linn. Soc. Lond.*, 1871.

We possess, as yet, but few of these graceful plants, and must persevere in our efforts of acquiring more of them, as well for the open ground as conservatories. These plants are not only quite as gorgeous as any of those which the ephemerous tastes and fashions of the day have brought into prominence, but they are infinitely more remarkable and instructive, besides far more lasting and grateful in culture. Several species, more or less adapted to our climate, yield the granadilla fruits, which yet ripen in the tropics at elevations 6000 feet high.

Almost every one, who possesses a plot of ground, maintains a garden in some form, or, failing this, rears a

few window or verandah plants. But simultaneously every one, as a rule, evinces a desire of acquiring some more accurate horticultural information, and of becoming acquainted with some item or the other of knowledge relative to the plants around him. This applies, with equal force, to the native vegetation, by which we are surrounded anywhere. We can scarcely cast our eye on any object without meeting some flower or foliage, from the humblest moss to the proudest tree, about which an educated mind is desirous to be informed. A room, however modest, can be rendered more cheerful by a few flowers; the splendour and elegance which graces a ball-room would be deprived of much of its charms without floral gayness. What can be more lovely than the buds of purest white in bridal wreaths, when they adorn the happy brow? Who did not admire, in the fetes for our charities, the garlands woven by tender hands, or the flower-bunches gathered with smiling faces? Or, if we wish to pay the last worldly homage to the departed dear to us, do we not seek for a few snowy blooms to press into the cold hand, or to carry to the last resting-place? In all the changeable events of this versatile life, whether the saddest or most hopeful, we are longing to find in the floral world some emblems for our joyfulness, as well as for our deepest grief. Ever sought, ever admired, at the happiest hours chosen as the silent interpreters of affection, and in the gloomiest moments as the symbols of woe, flowers seem identified with all the tender feelings and all the gentle sentiments of mankind. Can there be then more noble objects for our studies? or are we to rest satisfied with a mere instinctive recognition of their outer form, bare of real knowledge of any kind? One of the great objects, which a scientific garden is to fulfil for whole communities, indeed, consists in elevating the traditionary notions or the simple conceptions of plants to scientific cognisance and the highest educational standard.

In the oldest hieroglyphics, in the sarcophags of the mummies, in the Huenen burials, and indeed in all relics of the remotest antiquity, the historian has to trace plants, and is often led on by them in his archæologic researches. The physician must draw them hourly into use; the artisan, whatever may be his occupation, has daily to depend on them or their products; all our aliments are derived either directly or indirectly from vegetation; the very existence of the whole animal creation, indeed of man himself, is dependent on plants. There can be no wiser measure for general education, than to afford the easiest opportunity of gaining, at least to some extent, a scientific appreciation of these faithful and cheering companions of ours through life. Mark, when reflecting, how intimately the knowledge of the living plants is connected with the product, which they yield so beneficently for our wants. The artisan, who constructs the building, should be able to recognise in our parks the Spruce Fir, which furnishes him the deal for flooring; he would no less be interested in viewing, though here perhaps under glass, the Mahogany tree, whose wood passed for years through his hands. The chair on which we rest, the flooring deals over which we daily step, the pencils with which we write, the frames which enclose the pictures on our domestic walls, all these and thousands of other things surrounding us, are yielded by the vegetable world, and can become the objects of intelligent reflection and industrial teaching. The bloomy imitation of tapestry, or the flowery embellishments of decorated walls or architectural elegance, do they not call hourly plants to our mind? In the painters' landscapes, in the poets' ideals, are they not always among the foremost? And where can all this find a more vivid and a more easy interpretation than in a botanic garden true to its purposes? Few even of enlightened minds ever think, from how many different zones, from how many distant parts of the globe, all these materials of necessity and comfort have to be gathered. It is clearly the object of an institution, the meaning of which we now briefly discuss, to bring the sources of all these things before our contemplation, so that the observer may trace—by the impressive teaching of living forms, all mute, yet all telling a tale of their own—the origin of those vegetable substances, with which the demands of our occupation or the enjoyments of life bring us in constant contact. But shall we rest here? Ought not our medi- tation, when leading us from lifeless material to the wondrous living forms of vegetation, bring us nearer also to the ever-wise originator of the world.

"All are but parts of one stupendous whole,
Whose body nature is, and God the soul,
That, changed through all, is yet in all the same,
Great in the earth, as in the ethereal frame;
Warms in the sun, refreshes in the breeze,
Glows in the stars, and blossoms in the trees,
Lives through all life, extends through all extent,
Spreads undivided, operates unspent."

—POPE.

The large collections, then, in a botanic garden, whether of growing plants or of museum material, are not amassed without serving important purposes, and not accumulated merely to satisfy transient curiosity. This

may be shown by facts of vast number; let us note one or the other in testimony. As indispensable auxiliaries we want nowadays for studies in a botanic institution manifold collections, which, in fact, must emanate largely from the garden itself. For the full utilisation of such collections we need moreover to maintain a laboratory and ateliers of other kinds, to turn the riches of a really botanic institution to applied account. Besides, we require to fix all observations by lasting records, and render them, by issued volumes or by illustrations of pictorial or plastic art, accessible at all times. No sooner does a seed-grain germinate, than it can be utilised for research. The great De Candolle gave us in his *Mémoires des Légumineuses*, the results of his observations on the embryonic development of one large tribe of plants. The writer commenced to trace the germination and early development of Eucalypts and some other plants, to gain in intricate cases of affinity additional data for diagnosis, and these kinds of researches admit of the widest extension in manifold directions. Be it remembered, for recognising the multiplicity of material, that our choice for culture in this clime is from 30,000 out-door species alone, even if varieties are left altogether out of consideration; and how much varieties represent in number may be recognised in the contemplation of the culture forms of a single species of Rose, of Verbena or Dahlia. You may perhaps reckon on 3000 species of trees hardy in Victoria, 7000 shrubs, 12,000 perennials and 8000 annual herbs—grasses and rushes to be counted with the two latter. After such an immensity of hardy material has been selected from for cultural research, we have not yet allowed for the endless number of plants, which we can shelter under glass protection, the extent of hospitality thus to be afforded to delicate strangers being simply depending on the monetary endowments, which at any time or place may be at command. The total of Australian Dicotyledoneæ, hitherto ascertained to exist, is 6500, and although in some instances the supposed species will collapse, there will be also some com-pensating access from new discoveries. The number of Monocotyledoneæ is also comparatively great. Should we not largely surround ourselves with our own native plants, handsome and instructive as they are. The range of cultivation in our state garden has at times been already extensive. In 1865 seeds were collected of 700 species of trees and shrubs in the garden; seeds also of 170 kinds of grasses, of 1100 herbaceous plants, and of 80 species of ferns. Many of the species thus raised became also amply dispersed. It is not too much to affirm, that during the many years of my directorial administration of our young establishment, hardly a day has passed without some industrial plant having been distributed, and information on its rearing and uses having been afforded. The increasing population demands increased attention. I have just spoken of the thousands of native plants, recorded in volumes of our own; they gained at least a share of their contents from locally cultivated plants. Let me ask, whether we should not find the principal plants of our own continent brought before us in cultivation, for systematic as well as other studies! They are indeed excellent indicators of clime, of geographic features and geologic structure. You all have heard, for instance, of the Polygonum swamps, so often referred to in the works on Australian exploration. Assuredly it is of interest to possess in a botanic garden the tall, wiry bush, which occupies in intricate masses the clayey mud-flats of the interior, and which indicated to many a traveller, when almost perishing, the place of relief. Should we not be able to show in culture the poisonous herbs, against which the squatter as well as the explorer must guard? Of the 110 Saltbushes of Australia, some are ascertained to be eligible as culinary esculents; the majority of these plants are of high value for sheep-pasture. These, with other salsolaceous plants of other countries, I should certainly like to see well represented in a scientific garden, as well for instruction as for test. Very many plants can be best examined for characteristics when in living freshness. The number of Australian Villarsiæ known to R. Brown in 1810 was only two or three; chiefly through my own exertions we are now acquainted with seventeen; the delicate and often fringed membranes of their flowers, while they deliquesce in museum specimens, can be seen in our tanks at a glance. You can recognise the loveliness and above all the irritability of the Stylidia, of which we doubled the number since the time of R. Brown,

Now nearly 100 Stylidia are known.

only in the living state, the column of the flower snatching over at the least touch, a fact which even the keen eye of the natives seems to have frequently overlooked. It was largely through the exertions of our botanic department that the twelve species of Myoporums and Eremophila, recorded in R. Brown's Prodromus, were advanced to 60 in number; and it was through similar scientific exertions that the 70 Goodeninaceæ became increased to 180, the majority highly deserving of culture, and many available for medicinal use.

The command of large collections of museum plants, commenced by my personal field exertions more than thirty years ago, gave here local advantages for affording also to correspondents in other colonies a fuller insight into the characteristics of the vegetation of their respective localities. Among those who availed themselves of such facilities for occasional consultation, I count a gentleman of the Survey Department of Sydney, R. Fitzgerald, Esq., whose object it was to obtain, in doubtful cases, the names of plants for a series of drawings, prepared with ingenious skill and talent by his own hand. Ever anxious to lead such efforts into the best utilitarian channels, I suggested the publication of these illustrations in a weekly journal. With a readiness, which reflects great credit on the scientific taste of the proprietors of the *Sydney Mail,* space is to be conceded

for one plant at a time, as a preliminary issue in that valuable periodical, with an ulterior object of re-issuing the plates and descriptions in a connected form, as suggested in the first instance. Here now we have before us the first illustrations, to be followed, in regular succession, by others, an electro-plate to be used in final republication. It is superfluous to point out, that such efforts will likely lead to imitation, and will instil an amount of lasting information, the extent of which we cannot calculate or foresee. From larger works, elaborated in great scientific institutions, devoted to the accumulation and study of plants, will always emanate special publications, and among them in due time local floras of each populous locality. The sedulous and ingenious zeal of Dr. Will. Woolls, of Parramatta, has thus already provided for the requirements of that spot. To promote objects of this kind is within the legitimate pursuits of a botanic garden; and it would be vain to argue, that the interests of industrial artisans are not also involved in all these pursuits. I have a vivid remembrance with what an enthusiastic avidity many a student commenced his scientific collection of plants from gatherings in a botanic garden; how he sought for correct appellations, traced the indigenous localities of any species, endeavoured to understand the particular relationship of plants, and commenced to arrange systematically what he had gathered. Or I may have witnessed how the spare hours of a youth, eager for phytologic information, were spent, not in unprofitable plays or planless strolls, but among the flower-fields of free nature; how he soon recognised any additions to his collection, and greeted any rarity or novelty with the out-burst of absolute delight. Soon an impetus to more extended observation is given, kindred spirits are drawn into co-operation, while recreative pleasures are advanced to sound philosophic speculations or applied knowledge, and thus simultaneously a pure fountain of never-ceasing joys, or an everlasting spring of utilitarian riches, is opened. Such was the first commencement of the luminous career of some of our great naturalists, and such was also the first origin of some of the most important museums of plants.

As means of education the collections of a botanic garden, whether exhibited in their vivid freshness, or stored for preservation and reference, may exercise a vast influence. It is not too much, when I assert that even the study of languages and geography, through scientific garden plantations, may be fostered, and this in a manner more pleasing than in most other forms, just as numismatic collections are among the most lucid and impressive exponents of both history and geography, irrespective of ethnologic and linguistic researches; so much so, that coin cabinets, as auxiliaries for superior teaching, should not be wanting in any leading pædagogic establishment.

A few plants speak often more strikingly for the nature of a country than a mass of pages of descriptive explanation; or a handful of flowering branches, gathered on an unknown shore, indicate often at once capabilities for rural productiveness and settlement.

No less important is the relation of plants to geologic structure and climatic conditions, and we must insist on the collateral study of all these branches of discipline in the true spirit of the great writer of *Cosmos*, if we wish to assign to the knowledge of plants its true value. Only within the last weeks it fell to my lot to demonstrate, from material placed at my disposal by the secretary of the Mining Department, that in perished forests, where now the town of Haddon stands, deeply buried under superincumbent strata, once lived in this very colony a tree, closely resembling that of the Satinwood of the hottest part of India (Chloroxylon).

I have heard it often remarked by thoughtful and circumspect visitors, when they passed through our Botanic Garden, that now, for the first time, they had learnt from whence naturally came some particular plants, which they had reared for years at their dwellings; or that they had remained until then unaware of the name, or the native locality, or any other knowledge concerning plants, with which they had by sight long been familiar. Perhaps even it is not too much to contend, that no observant visitor can pass through a scientific garden, be it ever so often, without taking with him in each instance some new instructive information.

All this must largely bear on technology. Unquestionably any intelligent mind is pervaded by the idea, that the study of plants must have important bearings; but often this is only a vague impression, and very few may really have a comprehensive persuasion of that actual relation which exists between botanic inquiry and utilitarian application even of the current day; much more difficult then must be the recognition of all that which is only foreshadowed in a dim future. And yet we cannot cast our views around us without meeting, in every direction, objects derived from vegetation, if not plants themselves, drawn into applied use. From the strong beams of a building, or the tall masts and weighty planking of a ship, to some of the most delicate articles of turnery, we see brought before us woods from often widely-distant countries; or we notice, from the stout ropes of rigging to the most tender threads, woven into wearing apparel, the utilisation of basts from plants, which perhaps flourished in different zones and were reared by different races. What can be more instructive then, and what can more readily lead to new local industries, than a special display of such fibre plants, or any other group of utilitarian plants, in distinct areas of a botanic garden, where we may view them all at a glance, and from whence they may become disseminated? The work of a botanic institution for such purposes should, however, not be lightly disturbed, its means scattered, or its collections imperilled. It requires much watchful toil and research to bring together the material for large instructive collections, which, if even

only in part sacrificed, cannot be completed again without both laborious care and renewed expenditure.

Here in this hall I would ask, is it not the artisan who is specially interested in such collections? But the efforts to furnish or extend such means of teaching should not be en-narrowed by bondage, nor be discouraged by want of appreciation and sympathy.

To exemplify yet somewhat more the duties, which devolve on a botanic garden, for attaining the various objects set forth, it may be instanced, that its administrator must be extensively acquainted with the known vegetation of every part of the globe; he is thereby enabled, in his scientific relation to correspondents in all civilised countries, to secure by interchange or otherwise additional treasures for the institution entrusted to his care, and he is thus armed with the capability of recognising the real value and significance of the riches which in his institution are already accumulated. He further must be conversant with the nature of his new acquisitions, to assign to them their scientific place in his collections, to identify them for ascertaining their names and properties, and to provide for them the varied requisites for their culture, which he alone can fully understand. Only by long professional studies, which qualify for the administration of a scientific garden, is it rendered possible to discriminate between the known and unknown, to record new physiologic facts, to circumscribe additional genera and species, to trace out novel qualities, whether medicinal or chemical, whether technological or rural. Information by these means will necessarily exercise its influence in a professional department, and the reflex of this influence will be the diffusion of special knowledge in a manner best adapted to the requirements of time and place. So far the path seems clear enough, yet grave obstacles may arise to impede or frustrate the progress; the means of an institution may be quite unproportionate to the ever-increasing demands made on it, and the whole of an establishment may suffer in the inadequate struggle. Natural difficulties may supervene, occasional droughts or floods may imperil or destroy the work of years. There may not even be water from inexpensive sources to irrigate arid declivities, or to convert rocks into spots of fertility. Quiet, inostentatious arrangements may in many other ways be marred, not to speak of the impossibility of coping with the elements. Well- matured plans, involving years of preliminary action, may become suddenly overthrown; and the detriment thus sustained is then not only one of the institution itself, but one of whole communities, or perhaps even of science at large.

Unfortunately it is not everywhere that the originator of a horticultural institution for botanic purposes can exercise his judgment in the choice of the area; he finds it, as a rule, selected beforehand, and to the advantages of ready access of the multitude most other considerations have to give way. In an ideal perfectness of a botanic garden we would seek to command the utmost diversity of soil, from the heath-moors to sand-drifts, and from rich clays to humus deposits; and we would wish to have within our reach geologic rock-formations of various ages. But how rarely are such advantages attainable in one area! Local climatic influence will also frustrate largely cultural successes, without costly artificial means for imitating the conditions on which the growth of many a plant entirely depends. Few botanic gardens have, in this regard, the rare facilities of the one of Buitenzorg in Java, which in its several branch establishments on the slopes of a high mountain-range enjoys the means of bringing to perfection as well species bathed in the vapours of the hottest tropical jungles, as also such as only prosper on alpine heights, or such forms of vegetation as withstand the vehemence of icy storms or the rigour of protracted burials under snow, and all this in a comparatively close proximity.

When an important plant has once been introduced or tested, a task in which a botanic garden must always take a leading share, then rural enterprise and private capital are expected to advance the cultivation and utilisation of such a plant to commercial dimensions; or in particular cases the state may fairly aid by affording the necessary special means for successfully establishing such a plant as a new source of wealth to the country. I wish we could here do for the tea plant what the Governments of British and Dutch India have done for the formation of Cinchona plantations in the warm, temperate regions of the Indian mountains. The officiating director of the Botanic Garden of Calcutta, C. B. Clarke, Esq., M.A., gives, in his report of April of this year, the number of Peru Bark plants in the Bengal Government plantations as 1,741,474, irrespective of seedlings and cuttings in the nursery plantations. The established plants on Government ground of Cinchona succirubra (yielding the red bark) numbered then 1,233,715; those of C. officinalis, 440,000; other species existed in smaller number. Be it remembered, that this new culture was commenced in British India only a few years ago. But there large sums are specially granted for this new branch of industry, which sums, if we consider the cheapness of Hindoo labour, would need here, for similar purposes, to be proportionately enlarged to secure equal successes. For the thousands of Cinchona plants, kept in my brush shades, as yet the reservation of the needful mild forest plots, and the special fund for the maintenance and the multiplication of such plants in the woods, has to be obtained. The yield of seeds by Cinchonas is abundant after a few years, and by these means the subsequent increase of the plantation is easy, and not involving large expenditure. To private settlers in our own forest gullies and in the other Australian colonies Cinchonas have been furnished; in open gardens near Sydney a few scattered plants have flowered this year, they being in that genial climatic spot not imperilled by frost.

If the tea plant, both of China and Assam, was first of all largely raised in Australia by myself; if I placed it before the public in its growing state; if I drew repeatedly attention in public documents to the importance of its culture; if I prepared the first samples of Australian tea in our Botanic Garden for great industrial exhibitions here and abroad; and if, moreover, I annually distributed tea-plants and even seed to an extent not altogether inconsiderable, then I do think that I may rest satisfied of having fairly carried out my duty; I cannot step beyond this. Private enterprise and commercial capital must do the rest to advance also this culture here to industrial dimensions. The long-continued prejudice, that tea cannot be cultivated with mercantile remunerativeness beyond the boundaries of China has at last been overcome in the Southern States of the American Union, where a commencement has been made with the production of tea from indigenous fields. At Assam, also, tea is since some years largely cultivated by English planters, to one of whom, Mr. Bruce, formerly of this city, I am under obligation for his disinterested liberality of providing seeds in large quantity at my solicitation, while I owe the first large consignment of China seeds to the generosity of Sir Hercules Robinson, who sent it about a dozen years ago on my application. I fancy that tea plantations, even if made in first instance only for raising local supplies of seeds, would be profitable, the transit from China or Assam being difficult on account of the short vitality of the seed.

It is well known, that in China and Japan hitherto, with an unalterable obstinacy to any changes of method, the preparation of the tea-leaves is carried on by primitive processes of unaided manual labour, without any mechanical appliances of machinery. But what would be the onward course of literary intelligence, if we had still to adhere to the original manual operations under which writing and printing paper was produced, or if we had continued reluctant to adopt the mighty steam power, to speed and cheapen the production of print, when nowadays even the simple folding of printed sheets is rapidly done by machinery. Beet sugar, at its present price, could not possibly be produced without the steam-engines of factories; and there is nothing to prevent us to call that great mechanic agent also to our aid for heating and curling tea-leaves. Also in this respect we must emancipate ourselves from foregone conclusions.

On explaining to Mr. G. Joachimi, C.E., of this city, all the details of preparing tea-leaves for mercantile commerce, he has constructed on my suggestion an apparatus, to be worked and heated by steam; this will require, according to his opinion, only two men for performing the work which according to the present Chinese method would occupy twenty-five men. The mechanism, so constructed, provides for cutting wood for tea-chests as a bye-work.

The demand for tea as a commercial commodity is something astounding. The importation into Britain alone has been latterly about at a value of ten millions sterling annually; the consumption is even rapidly increasing. The process of establishing tea-fields is simple and easy. In North America the plants are placed six feet apart, each plant yields about one pound of tea annually, or about four pounds of fresh leaves; the gathering extends over about six months there. To foster tea-culture is to advance the great temperance cause.

The imports of tea into the United States for some of the past years were as follows, according to Consul T. Adamson, viz., year ending June 30 :—

The importation of tea into Britain for the seven months of each year, ending July 31st, was—

For the whole year—in 1864, £9,338,760; 1865, £10,044,462; 1866, £11,208,815.

Foreign select Oaks, or rare and important Pines, may have been introduced by the thousand, and legions of ornamental or industrial plants may have found their way from a botanic garden, directly or indirectly, into numerous cultural spots, and may largely contribute to grace already even many extensive parks; yet after all the extreme efforts of sedulous skill, and after an institution may have lavished its treasures with unbounded generosity, it still may find itself forsaken even by those on whom it had most claims. Here is before you the noble Dye Pine of Nepal (Pinus Webbiana). It fell to my lot to raise it in Australia first of all in masses, more than 20,000 seedlings having been reared in my nurseries two years ago. But the growth of this noble Spruce is slow. It requires three or four years before a seedling is strong enough to be trusted out. For all the patient care thus bestowed, and for all the foresight thus displayed, there can only be results after rather a long while, especially if even the facilities for culture are locally much impaired. Moreover, it is in the forest lands only where numerous plants, which I have introduced, can attain to perfection. It would, for instance, be hopeless to attempt growing the American Cranberries, Huckleberries or Blueberries, or the English Whortleberry, in the Melbourne Garden, with a prospect of a copious yield of fruit. In our Alps we have extensive sphagneta for many of these kinds of plant, but scarcely an edible fruit of any kind grows naturally on our snowy mountains. In Germany and some North European countries Bleeberries are brought as extensively to market as Strawberries. The Honourable the Commissioner of Agriculture for the United States, General Horace Capron, states in his report for the year 1869, that the culture of the American Cranberry (Vaccinium macrocarpum) is annually much increasing in some of the states; boggy sands of the savannahs, cleared of cedar brushes (Taxodium distichum), being chosen for this culture. In New Jersey about 1800 acres are now in bearing,

Producing 150,000 bushels in 1869, worth 12s. per bushel, therefore £90,000 the year's crop in that small

state.
and about 4000 acres more were up to 1869 planted with Cranberries. The profit on the capital thus invested is from 25 to 50 per cent, annually. One grower realised in eighteen years, from only ten acres Cranberry land, a fortune of £40,000. In the United States many thousand people are employed almost exclusively in picking of this and kindred fruits. In June commences the harvest of Strawberries; a month later follows the Raspberry; then come the Blackberries; in August commences the gathering of Whortleberries; after that the picking of Cranberries is proceeded with, which extends to November.

Gaylyasacia frondosa et resinosa (American Huckleberries). Vaccinium vacillans, Pensylvanium et corymbosum (Blueberries).

The miners, in prospecting through the ranges, might scatter the seeds of berries of those kinds along watercourses, or set out plants along rivulets or springy forest spots, from whence, when left to themselves, they would be sure to spread. The explorers of the interior, by strewing a few seeds of Acacia lophantha, Casuarina quadrivalvis or some Eucalypts over their camping ground, might yet more permanently indicate these bivouacs than even by burning or cutting letters in many trees. In all this a botanic garden has a fruitful field for exertions. I endeavoured to naturalise the medicinal Squill on our sea-shores. Lately the American species of Sumach have come in successful competition with the Sicilian Sumach, the species from which gatherings are made in the United States being chiefly Rhus glabra, Rh. typhina and Rh. copallina; all rich in tannic acid, all to be seen in our botanic garden. In translocations of this kind, which, under the sanction of usage, we are accustomed to call acclimation, we are expected to take a leading share; the former is the apter term, inasmuch as the possibilities of changing constitutional endurance to clime are restricted to narrow bounds. I should have spoken of the uses of a botanic garden as a horticultural school, of excursions to emanate from it into the flower-fields of the near environs; of the aid which ours has afforded to provide the festive boughs and decorative flowers at thousands of *fêtes* for our charities; but our time has drawn to a close. I intended to have also spoken of "the marvels of vegetation," which it might display, but must reserve this theme for a special lecture. Still this I would say, that all teachings should be in such a form in our own state gardens as not to encroach on the functions of our famed University, which has made already early and special provision for phytologic instruction.

For toxicologic experiments in a botanic garden the various poison plants become of importance, irrespective of the guardianship, which the display of these plants in a living state so instructively exercises. Investigations of this kind require lengthened attention, the separation, analysis and identification of organic poisons being surrounded with fat more difficulty than the examination of metallic or other inorganic substances. Besides, the development or intensity of the deleterious principle depends often on local causes, which are not always within ready range of observation, or perhaps even involved in mystery, such as physiology and chemistry have hitherto striven in vain to clear away. The so-called Cape Weed, for the presence of which I am not responsible, as it had already irrepressively invaded some parts of Australia as early as 1833 (Cryptostemma calendulaceum), was recently subjected in my laboratory to examination, with a view of ascertaining whether any chemically separable active principle might produce the violent purging, terminating in acute and often fatal dysentery, to which flocks occasionally become subject, but the investigation gave negative results. The deleterious effect arises therefore either merely from mechanical irritation and distension, when sheep have gorged themselves with this weed, or it may be traceable to a locally-developed poison, which in ordinary circumstances does not exist. The latter was ascertained to be the case by my own experiments as far as Swainsona Greyana, Swainsona lessertiæfolia, Lotus Australis, Gastrolobium bilobum and perhaps Stypandra glauca, are concerned. The two former cause in some localities cerebral affections in horses and other pastural animals, terminating in death; but the cultivated plants were found harmless. Gastrolobium, with some species of Oxylobium and Isotropis, the bane of the heath pastures of West Australia, has hitherto baffled all efforts to detect an antidote, but one of the most dreaded species, Gastrolobium bilobum, proved here in cultivation inert. Desert specimens of Lotus Australis produced in my local trials deadly effects on sheep, while our garden plant or the fresh herb from the sand shores of Port Phillip showed themselves innocuous. Stypandra glauca is reported to produce complete blindness of sheep in some districts of West Australia, the eyes, it is said, assuming a blue tinge throughout. Unless this grass lily has been confused with an allied and externally-similar weed—namely, Agrostocrinum stypandroides—we have again a plant, which with capriciousness has hitherto baffled our toxicologic experiments. Anguillaria and Burchardia, which early in the spring sprinkle their pretty blossoms so universally over the pastures of the whole of extra-tropic Australia, produce, so I have ascertained, innocuous bulbs, although belonging to a tribe of plants which includes the dreadfully-deleterious Veratrums and Sabadilla.

All this shows that an ample field for observation is also open for us in this direction, and this more particularly in a young country like ours. We are no longer in the earliest youth of our colonial existence, when the few scientific questions, arising then in very small communities, could receive at long intervals their answer

from the urbanity of leading European authorities, on whose professional advice or scientific opinion Australia however had no claim. But in the vigour and celerity of our colonial advancements we can afford no longer to wait the many months, which must elapse, before on every question the needful scientific information is obtained from abroad. Indeed, as might be expected, the applications for advice to a botanic department are now of daily occurrence, and ever increasing with the population and its varied enterprises. A central institution for phytologic information requires to be maintained among us somewhere, whether in this metropolis, or in any other city of Australia, may perhaps not be of great moment; but to build up such an institution for all these colonics, the local efforts here have not been altogether insignificant. The integrity of a well-constructed whole, on which so much forethought has been spent, should however not be lightly disrupted; or a carefully-organised department, of whose meaning or obligations but few can really be aware, should not be suffered to be impeded in its progress.

A botanic garden, which cannot afford to maintain at least one collector in the field, must be regarded as a very imperfect institution, especially so in a new country. For brisk interchanges particularly such material is needed as has amply the charm of novelty. Should we not also take an honourable share in unfolding the natural productions of the globe, especially when novelties or rarities are here almost within our grasp, and when assuredly the investigation of such is calculated to advance as well the interests of technology. The total of the territory of Australia, not yet traversed by exploration, may be compared in extent to the united areas of Britain, France, Scandinavia, Germany, Austria, Italy, Spain, Portugal, and Greece, and may therefore be estimated almost equal to extra-Russian Europe. It may be well imagined how eager the writer has always been to send emissaries into those wildernesses, more particularly while exploration and occupation progresses. New forms of plants require to be elucidated, the range of the species needs to be determined, the geologic relation of the different specific forms has to be traced; and it would be little short of blindness, were we not to admit, that industrial interests would be promoted at the same time. Even part of the unexplored coast of New Guinea is at no greater distance from Somerset at Cape York than Launceston from Port Phillip, and yet there are on that coast, within sight, snowy mountains as yet unascended. Even if a collector from our botanic garden could be pushed into that grand island, we would perform legitimate and honourable work, and might attain great results at but modest cost.

In some parts of Europe the fashions of horticulture have recently undergone some changes again, so far as to render the growing of flowers in masses, or bands, or decorative figures less predominant, as this extremely artificial culture is giving way largely to the far more natural one of picturesque or scenic grouping. I advisedly do not apply to this system of planting the term "subtropical gardening," which is yet retained in the excellent book published this year by Mr. William Robinson, of Kensington, who has contributed by this and other works (such as the one on the gardens, parks and promenades of Paris) so much to ennoble horticulture to simpler natural grandeur, and lead it to higher scientific tastes.

With still less logical propriety can the appellation of landscape gardening be chosen for this process of scenic ornamentation or group planting, as we comprehend something far more extensive by a landscape than the ordinary limited areas of gardens or even of parks. Call it whatever you like, this novel system is the very opposite of geometric or formal decorative planting; all these manners of culture have advantages of their own, more particularly in relation to special circumstances and requirements, educational, experimental or otherwise; these various cultural systems might even in some instances and to some extent be advantageously blended; but while they may all be represented in a botanic garden, the formal decorative planting or the cultures for exclusive ornamentation should there at least not prevail, but be made subservient mainly to scientific objects. Much in respect to bedding flowers and other simply decorative planting may be fairly left to the gardens formed for private entertainment and pleasure. Consider only, what is there to show after the season's expense and toil, when the gorgeous ribbons of almost endless length have faded away, or when the starry or other fanciful ornamentation have become blighted? Undoubtedly there was magnificence, but it was transitory. True, portion of it will naturally revive, other portions may be restored with little cost, but the main restitution of such floral displays on a gigantic scale requires expensive renewals, for which the state means, more particularly of a young colony, ought in early days to be too precious. I hold, that in a public cultural establishment, even in older countries, its endowments are more legitimately employed by devoting them to produce works of permanency and utility; not however falling into the other extreme of shutting out altogether ornamentation in its less expensive form. I further hold, that attractiveness in a young garden or park should commence in providing for befitting fencings, passable drives, reclamation of swamps, effective water-works, security against floods, shelter against storms and primary conversion of tracts of wildernesses into useful and reproductive verdure. We may gain the transient acclamation of a few of the less thoughtful, if we provide mainly, though only temporarily, for gaze, neglecting all that is lasting or urgent, or all that is scientific or industrial. But incontestably a reaction of public opinion will ere long set in; there will be little or nothing to show for much of the expenditure of years, and a just and resentful censure will sooner or later overtake us. Do

you not think, that even a private proprietor will view after a time his collections of palms, which from year to year increased in value and also in ornamental grandeur, with far greater pride than his remnants of ordinary flower-beds? Will he not compare with infinitely more satisfaction the imposing forms of his inexpensively up grown pines, from which he can harvest even the seeds, than the decayed relics of short-lived plants, which, however pleasing they may have been in their ephemerous glory, did involve probably a far greater outlay for maintenance than his lasting tree plantations? If means will allow it, let *all* these kinds of garden treasures be simultaneously maintained, particularly as the herbaceous plants provide a sight at once. If it must be flowers mainly, then let it be largely Cacteæ, Begoniæ;, Aroids, Scitaminæ;, all yielding flowers in the true sense of the word, for glass accommodation; and let it be the hardy diversified plants already named in the earlier part of the lecture, which, while they are as gorgeous as any, are not ephemerous, increase in value, convey a vast amount of instruction, and lead horticulture to a higher flight.

Reverting to the noble taste of scenic group planting, let us acknowledge it as one capable of being developed into the most picturesque magnificence, into the most grateful yield, into the most bloomy features, and above all, into the most extensive instructiveness. Many horticulturists of eminence have shown already, that for impressive groups of plants, even in colder countries, we can dispense with sub-tropic forms, although for half the year they may still more embellish the vivid and graphic effect by bringing Tree Ferns, Palms, Yuccas, Melianthus, Bamboos, Agaves, Fourcroyas, Cycadeæ, Papyrus, tall Gahnias, Cardylines, Cannas, Richardia, Acanthus and the great Mexican Composites (Ferdinanda and Montagnea), and other spacious or conspicuous and not absolutely tender plants, from conservatories there to the open ground, with a view of enhancing the effects of such groups as may permanently be constituted by the hardy Pines, Ailantus, Gynerium, Heracleum, Ferula, Donax, and even ordinary Artichokes and Helianthus; or the sown Ricinus, Sorghum and Maize; or the nobler species of Rheum, Polygonum, Gunnera, or the tall Kamschatka Angelica, all available even in colder zones for unprotected garden spots.

But what shall I say of our operations here and our facilities in this respect, when the larger share of Middle European conservatory plants, from a Norfolk Island pine to an infinite number of other plants, can be trusted out by us at once under a genial sky into the open air? How would such facilities be turned to account by eminent horticulturists of scientific knowledge and refined taste, if in Middle Europe the clime allowed of it? In this respect a botanic garden can fulfil also here its duty, by introducing the nobler forms of plants, and by educating the community to higher horticultural conceptions. You need not exclude the Rose, which we all appreciate as the queen of flowers; you need not banish anything else that is brilliant or gay or odorous, from Bulbs and Carnations to Petunias, Pelargoniums or Dahlias, or any other favourite flower; but let us allow also for the higher decorative and utilitarian work of horticulture a fair scope. Let us study to embrace all that is attractive in any form, whether native or foreign, into one grand whole of magnificence, without singling out a few transitory plants for almost exclusive culture, and without sacrificing to a monotony, which may become finally comparable to the Tulip monomania of a darker age, all loftier cultural interest, all that in this direction is elevated and great.

So vast are the treasures which floral plenty is shedding out before us, and so abundant and diversified are the gifts which from all zones are poured into the rich gardens of the centres of commerce such as the British metropolis, that it would be a wise measure to endow a state garden like ours so far as to secure and to retain exclusively the talent and industry of a professional horticulturist for selecting in London for us, to watch the arrival of every new plant of importance, to transmit it under vigilant care, and to conduct our inter-changes there and from thence on a vastly-extended scale. The amateur cultivators and the traders in plants, as also the administrators of public estates, are alike interested in such a measure, so long as it is not with the object of monopolising with selfish views of local aggrandisement the riches thus acquired, and so long as it remains our aim to turn these acquisitions to an enlightened account for whole communities.

It is unquestionably of importance to provide in any scientific garden from time to time accurate catalogues of the contents, quite as much as an inventory as to guide information and to regulate interchanges. But this is a work of such magnitude and constantly recurrent additional labour, that even the grand establishment of Kew has shrunk from the task of issuing an index of all its plants since a long series of years. Not only the difficulty is encountered to identify the plants with specific accuracy, for which purpose they must be examined while in flower and fruit; but moreover such catalogues become almost instantly incomplete or altered, partly because annuals are a very uncertain possession, partly because we cannot imitate all the conditions under which so many plants of the Alps, the moors, the heaths, the saline steppes or the tropical jungles, are naturally thriving; hence a number of species, capricious in their mode of growth, are apt to perish in culture, however much care may be bestowed on them. Then again daily new access is gained in any great horticultural collection, while in the process of discovery some changes will continually occur in the nomenclature, until all plants of the globe shall have been fully collected and exhaustively studied. Under these circumstances of adversity, I raised the question among leading directorial colleagues in Europe, whether by united efforts we could provide for the

publication of an universal catalogue in annual editions, or at a regular interval of a few years. It appeared to me, that just as all navigators possess one nautical almanac, prepared for them annually, so all horticultural establishments, those formed for trading purposes included, should enjoy the universal use of the best index which at the time can be compiled. From such standard list local catalogues could be re-issued whenever and wherever necessary, while each institution may irrespectively maintain its standard copy complete for reference to the latest day.

I revert once more to the forming of test plantations as prominent among the obligations of a scientific garden. What for instance can be more interesting than a collection of fibre plants, kept together in cultivation, to watch their respective endurance to climate, their rate of growth, their required nourishment, their proportion of yield, or to ascertain the strength of their products, the adaptability of the latter for various textile fabrics, their mercantile value and commercial demand?

The subject of fibres is one so large and so momentous, that we must discuss it some evening specially in this hall.

In an index published by the Commercial-Industrial Museum of the Maison de Melle, near Ghent, the scientific names of 550 kinds of plants, yielding textile fibre, are given.

A good many kinds of fibre plants were grown experimentally under my direction and subjected to various tests, recorded in the documents which emanated from the successive great Exhibitions. Some of the results of my experiments on strength were given in the descriptive catalogue of Victorian sendings to the Sydney Exhibition of last year. But such tests must be continued or extended. I should therefore like to have here under access many of the numerous fibre plants which are not yet even known beyond their native countries. The administrator of the Botanic Garden of Calcutta in his official report (of April of this year) alludes to no less than 14 new fibre plants, all allied to the Grasscloth, from Upper India alone. He thoughtfully observes:—"It is however not the excellence in fibre that is necessary to recommend a fibrous plant as economically valuable. The principal value of Jute (Corchorus olitarius and C. capsularis) is that it can be easily prepared," as it must always be our endeavour to liberate the fibre by mechanical means, but not by chemicals or heat, from the adherent other tissues. Mr. Clarke mentions as the most promising of these new fibres that from Villeburnia integrifolia, a small tree from Khasia, which with some of the other recommended fibre plants will probably prove hardy here. He regards the Villeburnia as the strongest of all the Sikkim sorts, it being used there for bow-strings. In its whiteness and its fineness of texture it seems to surpass even Rhea. This fibre can be more easily cleaned than any of the others tried on this occasion, and the bush yielding it is thought to grow like Osiers. Maoutia puya seems the second best in value; it is marvellously strong, and provides the Lepchas with the principal material for their native cloth. Again from Debregeasia velutina many of the Assam tribes obtain their cloth.

Of the Jute fibre there were imported from India in one single year into England no less than 60,000 tons. The United States of America imported also about 50,000 tons in a year, there realising £60 and more per ton, the importation in 1865 having been 91,549,800 lbs. Regarding fibres, we can learn here, by test culture through the year, during which months the best flax crops can be obtained, what varieties of cotton can yet be cultivated to advantage in our soils and in our latitudes, cotton culture in North America terminating with the 38° N. In short, there ought to be, in a scientific garden, representative plants of any important fibre hitherto drawn into industrial use. So it should be with important starch-plants, dye-plants, oil-plants, fodder-plants; so it should be with any species adopted in medicine. Remember only the pretty Lupin plants, of which about one hundred different species are known; how decorative are they all, how valuable, and so recognised since antiquity, as fodder-herbs and for green manure; how little comparison has also yet been instituted between the value of their species of the Andes, of British Columbia, of the Mediteranean regions or California. There are various kinds of Arrowroot plants, different in then degree of hardiness; there are oil-plants, which ripen a crop in three months, such as the Ramtil or Guizotia. All these deserve to be tested, and to be kept prominently before the eyes of our colonists.

Manures in their varied constitution and application require also experimental tests. Diseases of plants, in their increasing multiplicity, need to be carefully traced and elucidated, for which purpose the means of a well-sustained botanic garden ought to be available with legitimacy. Be it so far enough. But there is also something inexpressibly charming and recreatively instructive in viewing a very large assemblage of plants from all the different parts of the globe, scientifically traced to their names and origin.

But while devoting our energies and resources to the primary objects of scenery, we need not disdain those ornamentation-works which serve to embellish still more a stately structure. We can build grottos, if our means admit of the conveyance of rocks from the distance. We can raise islands, and convert swamps into lakes, whenever the resources of a young estab- lishment are no longer taxed with still more important obligations. We can have fountains playing in all directions, whenever our botanic garden can participate in that supply and pressure of our great waterworks which is allotted to other suburban parks. We can raise statues also, to glorify

monumentally what is noble and great. We can draw banded flowers through smooth and verdant lawns with the utmost of gaiety. But while attempting all this, we should never lose sight of the still higher objects for which a botanic institution is founded; otherwise, while trifling away slender means on perhaps even trivialities, we have failed to afford our early guidance to lasting prosperity or progressive and enduring advancements; and yet the accomplishment of this alone is an herculean task.

Rest assured a garden so conducted, as to fulfil its true destination, will never foil to provide in large measure the purest of enjoyments and the amplest of comfort also.

The sufferer, who may watch the Varied autumnal tints, will he be less cognisant in a garden of science how frailness finally prevails in all organic structure? Or when contemplating the forms of plants arranged by the rules of knowledge, will he feel less influenced to seek consolation from them? For, surrounded by the yet expressive and imposing sceneries, he may trace, here above all, how life, embodied in endless forms, is passing through its allotted worldly stages, finally only to perish; and so he must also learn to resign himself, with all else that is mortal, to a higher will.

"Though wrapt in clouds, yet still and still
The steadfast sun th' empyrean sways;
There still prevails a holy will—
'Tis not blind chance the world obeys.
The eye eternal, pure and clear,
Regards and holds all beings dear.

For thee, too, will the Father care,
Whose faith and soul in Him confide,
And though the last of days it were,
He calls thee early to His side;
His eye eternal, pure and clear,
Thee, too, regards and holds thee dear."

GLADSTONE, FROM KIND.

Though the true destiny of a botanic garden should be maintained then with some rigour, be it far from us to withdraw those sources of pure pleasure which scientific refinement offers there to a still higher degree. Indeed, if ever we attempted to restrict an institution of this kind to absolutely utilitarian purposes, we assuredly would find the separation or exclusion of simple means of enjoyment a total impossibility. The avenues, formed of timber trees, as forest representatives from wide distances, will afford to the strolling visitor no less of cool umbrageous expanse than if raised for his recreation only. The colouring changes of the vegetation throughout the seasons, or the varied periodic hues of foliage and blossoms, are assuredly not diminished in their impressiveness because the perhaps tyrannic sway of fashionable predilections, or of tastes subject to endless dispute, are left unobeyed in the exercise of the free judgment of science. When thus in youthful freshness the spring unfolds the tender leaves and discloses buds innumerable, then it awakens also here the earliest hopes of the rosy youth, or renews the smiles and faith of depressed spirits. And while all nature around rejoices in hopefulness, the swift arrows of Eros are sent also unerringly from yonder close green of dense retreats, whether created for stern science or idyllic enchantment only. Those who listen in affection from fragrant bowers to the warblers of the air will not discern whether yonder groves were intended to serve mere scientific grouping, or purposely formed to arouse some of the sublimest of sentiments. The soul, sunk in mournful sadness, will also find yet some consolation in a garden of knowledge, and will feel how the power of a Divine Providence pervades every leaf and flower; or the mind susceptible to the religious teaching of nature will there also recognise how the apparently lifeless root or grain sprout under the spring rays again with hopeful vitality from the cold darkness beneath—a symbol of an imperishable existence and of an eternity beyond this world.

"When spring's fair children pass away,
When in the north wind's icy air
The leaves and flowers alike decay,
And leave the rivelled branches bare;

Then from Vertumnus' lavish horn
I take life's seed to strew below,
And bid the gold, that germs the corn,
An offering to the Styx to go.
But when the hours in measured dance
The happy smile of spring restore,
Rife in the sunny golden glance,
The buried dead revive once more."

BULWER LYTTOX, FROM SCHILLER.

The Microscope.

A Lecture, DELIVERED BY Sydney Gibbons,
On 23rd November, 1871.

ALTHOUGH I have much pleasure in addressing you on a favourite subject, I yet feel some little embarrassment, for I may mention, in the first place, that the subject is not of my selection. I should have preferred one admitting of experimental illustration, as I am in the habit, in the course of my practice as a teacher, of operating while I talk, and, therefore, even from force of habit, like to have something to do with my hands. Again, it is obviously impossible for me to pretend to show to all of you the objects themselves; still, although a friend of mine told me in this room that the lecture would be of no use without such demonstration, I will try with the instruments I have before me, and the drawings you see on the walls, to elucidate the subject. Another point that occurs to me is, that while in class lectures I am in the habit of at once plunging into the subject, giving out the heads, and then working them out step by step, the microscope is too discursive a subject to admit of that treatment, but requires much introduction; for, even in the first place, to explain its construction and operation we have to call in aid the two special sciences—optics and mechanics, to be followed by chemistry; and when by these means we have our instrument completed and in working order, our sphere of action is then the domain of entire nature, diving into the earth to examine minerals, dissect fossils, then tracing vegetable growth, and so upwards till we come to the highest classes of animal structure, all distinct sciences within themselves, and not easy to link into a regular chain. We will, however, make some attempt towards it.

NOTE.—*This is a very much abridged report, in fact, a mere outline of the lecture, and several topics are altogether omitted. But it must be conceded that it was a difficult lecture to report, as much front the manner of delivery as from the number of technical terms and names which could not ha excluded. Had I changed places with the reporter, I doubt if I could have done better for him. I hare sketched in a few blanks, but memory is the only record I have of what was actually said*.—S. G.

A public audience expects to be interested as well as instructed, and looks for something in the way of exordium. Now, I have not yet decided what kind of exordium I shall offer you, but may take a hint from Virgil, who, in dealing with a not very remote subject, expresses himself in terms which I may thus paraphrase, viz., that, "it being a minute one, some may consider it trifling, but the importance is not commensurate with the minuteness, nor is the honour and glory of dealing with it as small as the objects themselves;"

Georgic iv. 6.

that is, he quaintly adds, "if the fates only let one alone, and Apollo hears when invoked." In another similar place

Georgic ii. 46.

he promises not to detain his readers "with a made-up story, or by meandering or a long exordium." I would wish to follow his example.

Let us take the first object to hand (as I now do from the table before me) as a starting point. We look at it, feel it, and so acquire a certain knowledge of its more obvious properties, but say that for our purpose that does not suffice; we require to know more than our unaided senses can tell us—to enlarge the minute—to examine by increased light, transmitted from below or reflected from above—to obtain the relief of light and shade; in a word, we need the help of the compound microscope, of which by means of the model before me I will endeavour to show you the arrangement, and the passage of the rays through this combination of lenses producing the image required.

From every object perceived by us rays of light radiate in all directions, as instanced in the diagram before us of a lighted candle. Now the greater the distance we are from the candle the fewer of these rays enter our

eye, for, suppose this foot-rule to be the diameter of the pupil, if I place it at a certain distance from the candle it receives four of the rays depicted; further off, two; nearer, six and more, and so on.

Now the apparent size of an object depends on its distance, and bearing this in mind, it follows that the farther off an object is from us the smaller is the angle it subtends at the eye. Instinctively, if we want to examine an object more minutely or with increase of light, we bring it nearer the eye, and when we can get some instrument to do that for us we have achieved much. Now, it is the lens that accomplishes this, the rays of light being bent and undergoing what is termed refraction in passing through it to form the image on the other side; and it is an important point to remember that the eye sees the object in the direction of the rays which enter the eye without reference to that of the rays outside the lens, the refraction being the greater according to the convexity of the lens; so that, as in the model diagram before us, the object presents itself to our eye, not in its real position and dimensions, but nearer and enlarged, because viewed under a higher angle.

The rays, having passed through the lens termed the objective, have to pass through a second and upper lens (the eye-piece) to reach the eye; and here let mo mention that, although I have commenced by explaining the compound microscope, I might have introduced it to you in the first instance in its simplest form, viz., the ordinary pocket lens, familiar, I presume, to most of us, and with which a great deal of work may be done. Mount it on a pillar, and you transform it into one capable of adjustment; you may make one lens of the group an illuminator to another. If a higher power is required you have recourse to a Coddington, an excellent instrument, and far superior to the popular Stanhopes sometimes sold for it. Then there are the Wollastons, with one, two, or three lenses acting together, and magnifying the object itself directly, and not the image.

[The lecturer here went into some practical and technical illustrations of the construction and manipulation of the instruments before him, which cannot well be followed on paper, remarking that to such a delicate pitch had instruments been carried, that powers up to 1/50 th had been made, but that they were very difficult to use, and limited in their application; also as to various contrivances employed when an object that has been mounted before is again required for view, it becoming then sometimes a matter of importance and difficulty to find it, such as Maltwood's finder, a plate of glass on which a square inch is marked, divided into 100 each way, every square having two numbers, one for latitude, one for longitude; and which, by putting in the place of the object and duly marking, furnishes at any future time a certain indication to find the object; also the admirable contrivance of Powell and Leland, in which every stage movement is graduated, so that the position of the stage and of the object on it during any given observation can be registered. He then went on to say:—]

Let us now say something about the objects themselves, as illustrated on a magnified scale in the various drawings covering the wall before you, and which I may parenthetically observe are all supposed to be lighted from one point, and calculated to be best seen at a distance of about twenty feet.

I shall not trouble you with any remarks as to the mounting of objects for microscopic observations, but proceed at once to state that the first object that we have for consideration in dealing with organic matter is the cell, the primary form of which is that of a simple closed bag with contents, the form varying very much indeed, but the typical form being round; and the contents varying also greatly in both animal and vegetable products, but yet so closely allied in lower grades as to render it difficult to distinguish between them. A notion has sometimes been advanced that there is a gradual elevation of structure from the vegetable to the animal kingdom, and popular writers often mislead their readers by describing as "links" objects that appear to partake of the character of both. There is no such progression. The two kingdoms diverge from a common boundary, and that is the lowest type of each—viz., the simple cell, which it is often difficult to refer to its right place. Many mistakes have been made in this matter, and a large portion of the microscopic work being done now is the distinguishing between plants and animals, and referring back to the vegetable kingdom many objects formerly classed as animal, particularly by the celebrated German Ehrenberg, who, while it must be confessed that he has done enormous work, must also be charged with giving the microscopists of the present day a very large amount of work in undoing his classification, arbitrarily founded on hasty conclusions as to the existence of prehensile and digestive organs in what are now proved to be vegetable organisms destitute of both.

A simple vegetable cell consists of an outer coating called *cellulose*, nearly akin to the substance we know as wood; and inside that a thin lining, known as the primordial utricle, containing nitrogen, and it was this nitrogen that was for a long time one of the principal difficulties in the way of classifying the low forms of vegetable and animal life. Starch was considered at one time the distinguishing characteristic of vegetable, nitrogen of animal life; but now we find that substances very akin to starch exist in animal bodies, as in the base of the brain in man, so closely akin, indeed, that at present we do not know how to distinguish them from it;

Lerp-Amylum, a constituent of the insect secretion on a variety of Eucalyptus (dumosa), is another example.

while, as I have just mentioned, nitrogen is to be found in the inner lining of vegetable cells.

Inside this cell is the protoplasm, a viscid substance which is, in fact, the growing material, such being the signification of the term, and with it is generally to be found some colouring matter, as chlorophyle.

The figure I now draw your attention to illustrates the growth of the cell, which multiplies by simple division, a proceeding a little at variance with the ordinary course of arithmetic. First of all we see the protoplasm divide itself in the original bag, gathering itself into two bodies, and then the outer coating becoming constricted, these bodies are severed, and the development has taken place. Now let me draw your attention to this illustration of the plant *palmella cruenta*, or blood-rain. We hear sometimes of frogs in stones, of which there are no authenticated cases to bear proof, but there are other things nearly as wonderful, and one of them is the amazingly rapid growth of this plant; the blood-rain does not appear as a liquid, and no one sees it coming down, but it shows almost suddenly as clots of blood coagulated on the ground.

The main secret is that there is more moisture than anything else in its composition, and two solutions are open of the phenomenon; one, that it may have rapidly developed while, in fact, those observing it were under shelter; the other that it may have previously grown, but have dried up, and so remained undistinguishable until expanded by the falling moisture. Then we have red and green snow (as it is termed), occurring in the same way, which, in the Arctic regions, is found in great abundance. The same are also heard of in the Alps, the genus being named, from its very simple structure, *protococcus*. In this plant, then, and others of a like low organisation, which you see here pourtrayed, and which are called cellular, such is the operation of growth and division; there is no differentiation, as it is called—each part is alike, and each cell capable of living for itself, and like its progenitor; whereas in the higher plants you find organs set apart for special functions—one to form bark, one to make wood, others to form the fruit, the flower, and so on.

Now, proceeding a little higher in the vegetable scale, we come to a very curious object known as the *volvox globator*, which, by the way, was one of those described by Ehrenberg as an animal, but which may be simply described as consisting of a number of small vegetables enclosed in a common envelope, as here depicted. These plants are all aquatic, and have a remarkable power of movement, sometimes spinning along with great rapidity, at others remaining in one place but revolving with as great rapidity. It is a globe containing, or rather consisting of, a number of smaller ones, each of which is an individual, and is in due time discharged from the family group to enter upon its independent existence. Another illustration of this family before us is the *gonium pectorale*—so named from a fancied resemblance to the Jewish high priest's breast-plate—a group of sixteen cells spinning along on edge, and as the time arrives for each little plant to be sent into the world, it is simply cast off, and the remainder of the group goes spinning along without it. In course of time the one left opens into four, these each into four more, and so the original number of sixteen is arrived at.

Here again is the picture of the plant Zygnema, with several others akin to it, and known as *confervæ*, and which you will find in all the fountain basins in the Fitzroy Gardens, in the shape of a green, fibrous-looking fringe overhanging them. You remember the old fountain in Collins-street at the time when attempts were made to get up a panic about the Yan Yean water, and that when this green growth made its appearance on it, an outcry was raised that all that horrid green stuff was in the Yan Yean water, such simply not being the fact at all; the plant was local, and its growth was favoured by the constant moisture. It presents the curious phenomenon of conjugation, the adjacent cells on different plants uniting, and their contents blending, to form a *sporangium*, which ultimately gives rise to a new growth.

We now come to another class of objects which were regarded as animals by Ehrenberg, who appeared to have considered everything small and moving as an animal; but that test has been long since given up, for many plants are much more active than animals, moving with a rapidity indeed that would be incredible in an animal, while you cannot find a vegetable much quieter than the oyster, or, better still, the sponge.

We now come to the Diatomaceæ, of which each individual is complete in itself, but not having a skin or woody shell, but one of glass or silica. These shells are extremely beautiful and of endless variety of form, forming constant objects of interest to the microscopist. Amongst those here depicted I may briefly enumerate (pointing to each) the *actinocyclus*, a circle with rays; the *coscinodiscus*, the *eupodiscus*, the *triceratium*, the *Biddulphia*, the *Arachnoidiscus*, from its similitude to a spider's web. Of a slightly different class are the *Pleurosigma*, the *surirella*, the *gom-phonema*, the *melosira*, the *navicula*, &c.

All these consist of two of the shells I have spoken of with a little organic matter inside; and in addition to these discs or other forms here depicted, of which there are two in each plant, there is also a little hoop of glass or silica connecting them. This hoop is elongated, the valves being pushed out, and a new pair of plates formed between the others, and then the two uniform bodies separate. Some of these forms adhere together, attached to a stalk, and this variation forms one means of classifying them; here is another kind, presenting the appearance of a row of little rods slightly adherent, but which keep on sliding nearly apart and then back again with great regularity.

Richmond, Virginia, U.S., may be said to be built on these objects, for the soil there contains them in abundance for miles; or, to come nearer home, here is a bottle of white powder representing a portion of the railway embankment at South Yarra, just by the tannery, familiar, probably, to most of you, and which has

proved very rich indeed in these objects. Before the work was constructed there was a swamp there, and the earth was dug out from the sides and thrown up to form the embankment, but the ground being swampy the work sank down and the mud underneath oozed out, rich in the most beautiful forms, some forty different species being found in it.

By Messrs. Ralph and Coates, who were before me in that field.

This subject of the South Yarra embankment suggests the remark that the nomenclature of these objects is somewhat confusing, and people at a distance from each other, finding some object new to them, often consider it new to all. There was one of the shells I have been referring to which was exhibited here as a total novelty, but within a week of its exhibition I received a letter from England asking me to send the writer some of "'that' *Stauroneis Fulmen*, from South Yarra," so that after all it proved to be known and named in Europe before it was recognised here.

But the feature which, more than the beauty of the forms, has endeared the *Diatomaceæ* to the microscopist, is the possession of delicate markings, varying in the different kinds, but tolerably constant in each. These markings, which usually consist of a groundwork of very fine lines, are, and long have been, used to test and compare some of the power's of microscopes. Not content with making out these lines—many thousand of which go to the inch—microscopists are ever striving to get beyond that feat, and to define what the lines are made of—whether mere dots, areolations, elevations, depressions, Some of the earlier photographs showed these as hexagonal areolations, but more recent observation supports the view that the lines are rows of hemispherical elevations. For many years I have been satisfied that the lines in the *Pleurosigma formosum*, which I have most closely examined, are so formed; but when I made the observations, the microscopic world was satisfied with the views which are now going out.

We now come to speak of the spore which is formed by the union of a pair of cells, and which eventually becomes developed into a new plant. Several varieties appear in the drawings before us. We must not omit to notice here a very remarkable order of plants, viz., the *Desmideæ*, which nearly resembles the *Diatoms* in habit and mode of propagation. There is, however, this essential difference, that while the latter are silicious, the Desmids are wholly composed of vegetable matter, chiefly bright green colouring. They are found in sweet, pure waters, and in no others do they thrive. In this group—which represents the varieties that I have found in the Yan Yean—is seen a great variety of elegant forms, while in the adjacent drawings, representing the same water after contamination, as found in the gutters, but few are to be seen.

Ascending upwards in the scale we have to note the *fungi*, containing more nitrogen than some of the other plants, growing with great rapidity, and more or less characteristic of putrefaction, preferring decaying matter, chiefly animal. There are, in fact, some of the fungi which blow-flies mistake for meat.

These plants do not possess so much interest for us as those whose beautiful forms and curious habits have already occupied our attention; they are nevertheless of more real importance, since from their ranks we derive, on the one hand, esteemed delicacies, and, on the other, poison and the associates of disease. The scientific distance between the truffle of our *paté de foie gras*, the deadly amanita, and the *oïdium* of the fatal diphtheria, is hardly greater than between the rose, apple, and peach, which are all of the same natural order, rosacea;. But I may mention two or three varieties. Apart from the mushroom and the truffle, there are several poisonous kinds; and others, again, which, although suspected, are still alleged by some to be very good and wholesome. Then we have the common mould, that beautiful little plant, of which cheese-fanciers are so fond. Viewed with a reflected light from one side, and with a binocular arrangement, it is a magnificent object for inspection, showing as a forest of little trees, each tufted with a crown of bright globules, and all the other moulds are more or less of the same kind. There is yeast, called by the Germans *ober* and *unter-hefel*; the *ober*, which is the aerial fructification, being diffused in the air as dust, the *unter* settling to the bottom. There is the *oïdium* attacking the grape, and that affecting the human throat in the case of diphtheria.

A remarkable fungus, which has given rise to the mistake formerly noted, is the Sphæria, found, among other places, in Tasmania; it has also been seen in the vicinity of Melbourne. I have seen in print vague accounts of the remarkable link between the animal and vegetable existing in a body, which was plant at one end and caterpillar at the other. It was this object, of which several are on the table, viz., the Sphœria, growing, as is its wont, out of the head of a caterpillar, which its germination as a parasite had killed.

Still ascending in the scale we come to ferns, and the peculiarity to notice here is the fructification, which consists of a large number of little capsules, or hollow cases, called sporangia, generated on the surface of the under side of the leaves, and shown in the diagram before us in the markings extending along the margin of the frond.

Each sporangium contains a number of granular particles, or spores, a something partaking of the nature of a seed, but still not a seed, but something from which the growth springs. This spore expands under the influence of heat and moisture, and develops into what is very much like a little leaf, and is called *thallus*, and from certain organs in that *thallus* a new plant is produced, distinct altogether from the spore.

We now come to plants of a more complex texture, where there is differentiation of organs, where one cell may go to form bark, one to form wood, another to the reproduction of species, &c.; but we have still cellular tissue, and organs formed from it, as, for instance, the strawberry, a fruit of very loose texture, with large cells preserving their rounded form. But when cells are compressed we get an hexagonal structure, network-like. And in this question of pressure we have to consider not merely the pressure itself, but its direction; thus, when the longitudinal increase is greater than that of breadth, or thickness, the cells are elongated while they are laterally compressed, and we have the fibres of wood; flax, which consists of such elongated cells joined end to end, may be quoted as a good example of woody fibre. In cases of very loose structures, where the growth of the plant is rapid, this internal pithy tissue is frequently torn away in the middle, and the pith is sometimes broken up into discs, or spirals. We get in some woody tissues markings of a peculiar character, sometimes spiral, sometimes disc-shaped, as instanced in this section of fern, showing ducts, or long hollow bodies, with traces of spirals. The seed of the common cress, when moistened, appears to exude a jelly; this consists of spiral fibres, forming originally the outer part of the shell of the seed, which the water releases from their confinement.

Another vicissitude occurs with regard to the process of filling up; in secondary deposit forms there is a continual deposition of matter taken as nutriment in the interior of the cell, sometimes soft, sometimes hard. In the core of the pear, for instance, there is, as you know, a gritty portion, that gritty portion consisting of a number of these cells flattened. In some rushes the cell is altered from its round form into a star, the rays of which spread out to reach their neighbours. A denser variety, in which the cells are nearly filled with the hard deposit, constitutes nut shell.

The diagrams now before us show the arrangement of the stomata or breathing pores existing in great numbers, chiefly on the under sides of the leaves of plants, by which the air and moisture are taken up and passed into the cavities inside, as instanced here in the oleander, where a cavity is protected by a number of hairs furnished with a multitude of pores; or again in the balsam. These views of the cuticle of the lily and aloe show the peculiar arrangement of the cells by which those immediately surrounding the opening form lips which almost seem to serve as valves.

Another feature worth notice is that of the crystals existing in many plants, found to be principally composed of oxalate and phosphate of lime and other similar earthy salts.

Among the most important of the vegetable matters of which the microscope takes cognisance, and one in which its usefulness is remarkably shown, is starch. Although all starch is starch in a chemical sense, there being no difference of composition between the expensive arrowroot of Bermuda and the similar product of the humble potato, still the difference of form is very great, and by the aid of the microscope the starches of known plants can be distinguished with unerring exactness; not merely for the detection of adulteration or substitution, but as data useful to the juridical expert, who utilises items of information in which others would not perceive any pertinence.

The use, too, of polarised light, which marks each individual particle with a black cross, is in such observations of singular value, as from mixed fields it instantly weeds out all the starch, leaving us the residual matters to deal with.

We now come to animal life, the simplest form being indistinguishable from the simple vegetable cell, a rounded hollow bag with something in it, and very often little cilia or filaments attached to it by which it swims about.

Starch and nitrogen, although useful aids, are not then sufficient in themselves to distinguish between animal and vegetable, and we have already seen that motion, power of selection, and apparent volition are highly deceptive. Fortunately, with the discovery of the fallacies attending the old tests, new and more satisfactory ones have been acquired. Plants assimilate simple substances from the inorganic kingdom, and build them up into complex forms. Animals require for their food these complex bodies, which by decomposition they ultimately simplify.

The Proteus, so called from the multitude of forms it can adopt, is merely a little dot of jelly containing a few bubbles, lazily rolling itself along in the water without limbs or organisation. But it makes what limbs it wants when it wants them. You may see it pushing forth something like a leg, and then another, sometimes apparently for diversion, but at other times for locomotion or food. When it swims or rolls up against anything good for food, it simply surrounds its dinner, forming its whole body into an extemporaneous stomach.

Closely akin to this, in fact belonging almost to the same class, are some beautiful objects, which for a long time were placed higher up in the scale, the Foraminifera.

They have extremely beautiful shells, of most elegant forms, all very minute, but still varying much in size, although the largest does not exceed the size of a very small pin's head. They are very widely diffused, so much so, that by a figure of speech the pyramids may be said to be built of them, as they are built of stone, which consists in greater part of these fossil shells; and to refer to a more familiar subject, you find them plentifully in

new sponges.

Then come the Polycystina, very beautiful shells, varying much in form, and composed of silica.

[The lecturer said that he had refrained from encumbering the minds of his hearers with any more technical nomenclature than was necessary. To show that such as he omitted would profit them but little, he recited the names of a dozen of each of the last two genera which formed the illustrations.]

And now having worked up to animals, I think I may introduce you to the waters, in which, as was the case with plants, we find the simpler forms. Here is a group showing the natural history of the Yan Yean in 1859, all animal and vegetable forms, but yet consistent with perfect sweetness and wholesomeness of the water, for this very good reason, that the majority of them would not live in anything else. Several of these animals are furnished with cilia round the mouth in continual motion, producing the appearance of a wheel going round, or like that peculiar appearance you may have observed in a field of corn when moved by the wind, and appearing to progress, but not doing so in reality. Hence these animals are called *Rotifera*, the object of the motion appealing to be the attracting, as with a whirlpool, smaller animals into the vortex of the mouth. This drawing represents a comparatively large animal of this species with two wheels, and a very pretty experiment may be made with some dry particles of carmine or indigo thrown into water with these animals, when the floating particles indicate the direction of the current.

A word or two now about parasites, and to which I ask your particular attention. They are very ugly and very injurious, and they are external and internal.

There are external ones, such as the flea and bug, microscopically beautiful, and some very remarkable ones of the family of the Ixodes. If you kill an opossum you are certain to find in one, if not in each ear, one individual of this family, with a curious kind of mouth opening outwards with a kind of claw similar to a "lewis," a tool used by masons for raising stones, and which proboscis the animal will suffer to be torn off before it gives way. There is the Demodex, living in or near the skin of animals, and not migratory; as, to take a familiar instance, in the region of the face, chiefly in the neighbourhood of the nose, are specks, which, on being squeezed out and examined, are found to contain minute animals, something like maggots; unlike other parasites, this kind bears no relation to either disease or dirt. Here is a magnified photograph of the sheep scab, Sarcoptes ovis, from this original specimen, and here is an enlarged drawing of the animal. But the class of parasites I wish more particularly to speak about is that of *Entozoa*, an internal one, living within us; not a very pleasant subject, but a most important one.

The *trichina spiralis* is ordinarily known as indicative of measly pork, although the name measly is rather a misnomer. Here is a view of muscle containing an oval-shaped bag termed cyst, in which is coiled up the parasite. This is found very generally in pork; it is scarcely possible for any but dairy-bred and dairy-fed pigs to be without it; in fact, I very much question whether any pig exists that is free from it. It is commonly said that pork ought to be well done, but I assure you these things take a good deal of doing, for in some stages of existence there are both animals and plants that survive an enormous amount of ill-treatment; and it is a question among naturalists of the present day whether boiling is sufficient ill-treatment. Many germs are known to survive a temperature of 300° Fahr., hence the mistakes of those who entertain the idea of spontaneous genera- tion, and who fancied that because they boiled their preparations all germs had been excluded. So far from this being the case, recent rigorous experiments have shown that some of the germs, both animal and vegetable, the destruction of which is most desired, will endure remarkable vicissitudes of temperature, and even resist many reagents. These (trichinæ) are particularly long-suffering creatures. Many people are in the habit of eating pork slightly done; in Germany, for example, it is often merely smoked, with but little more cooking; and in that case the trichina simply becomes an inhabitant of human muscle, increasing and multiplying very rapidly. That such is the fact is exemplified by this portion of human muscle, taken in Melbourne, and which has multitudes in it. I do not suppose that Moses knew anything about the trichinæ, but the disease they cause may then have been known; and the prohibition of pork in a hot climate is undoubtedly a wise thing. The two drawings to which I now direct your attention show the figures under different conditions of a variety of the tape-worm, sometimes growing to the length of 30 or 40 feet. This kind normally inhabits dogs; and there is every reason to believe that the presence of them in human beings is often due to carelessness in allowing children to play with dogs, and the latter to lick their faces. I have here some ugly things for which I am indebted to our health officer, Mr. Girdlestone. They were taken from a pork kidney, and belong, we believe, to a kind called *strongylus*. But at present the kinds best known are extremely large, and whether these are young ones or a variety is not yet determined, but probably soon will be; for while the kidney was under examination, a cat stole a portion of it, and from a plump, fine animal it fell away, and is now decidedly out of condition. It will soon be sacrificed in the cause of science; so that the fate of that marauding cat may point a moral, and its tail adorn—a museum.

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The Eastern Question

MR. CHAIRMAN AND GENTLEMEN,—We are met tonight,—I hope we all feel that we are met under circumstances of some anxiety, and it may be even of some public danger. We have great authorities—authorities to be found amongst leading public men, and authorities many in the public press, who tell us that we are, for some cause hardly fully explained, upon the brink of that great calamity which men call war; and some of these authorities beseech us not to say much about it. They tell us that ill-advised words may precipitate the danger we would shun. They say we must only speak in whispers, if we speak at all. They remind one of the advice that is given by guides to climbers amids the snowy solitudes of the Alps. They are told not to speak above a whisper, or the avalanche of snow which is above them may descend, and overwhelm, not them alone, but the village that lies in apparent security far below. And now, Sir, we are advised to leave everything in the hands of Her Majesty's Government, who will take care, first of all, and above all, if they can, of the peace of Europe, and of what is of not less consequence, the interests and the honour of this kingdom. I sometimes have thought during the past year that Her Majesty's Government were rather too much in favour of peace. They are in favour of peace—if not at any price, at least at a price which some of us would scarcely wish to pay for it. They are willing to sacrifice the interests, the happiness, and the freedom of millions of the Christian population of the Turkish provinces; and I am afraid they would make another great sacrifice—namely, they would sacrifice the fair fame and the honour of this country, in binding us in perpetual partnership with the worst and the foulest Government known upon earth. But if our Government is so much for peace, what is to be said of other Governments? All the other Governments are also for peace. At this moment we have no subject of dispute with the United States of America; the justice and the magnanimity of this country have settled every question of difference between our free colonies of America and the mother country. If we come to Europe, we find that we have no quarrel with our next neighbour, the French nation. From the year 1860, when that great commercial treaty was negotiated, we have had a constantly diminished feeling of antagonism to France; and at this moment I believe there exists between the French people and the English people a more durable friendship than we have known in any former period of the history of the two nations; and if the gentlemen in the middle of the hall will allow me, I will give them in one sentence one fact that will show how great is the importance of that treaty to which I have just referred. You have seen to-day in the papers a letter addressed by the Chamber of Commerce of Manchester to the Chambers of Commerce of France, and from that letter you will find that whereas before the treaty the imports from France into this country were only thirteen millions sterling per annum, they now amount to over forty-six millions sterling, and that the exports from this country to France, which before the treaty were only nine millions, amount now to twenty-seven millions. Well, it is this increased trade and communication that have been so advantageous in promoting friendship between the French and the English peoples. Now, gentlemen, if every one will try to be quiet we shall get on perfectly well. I was saying what was the state of things with France. I have no doubt if you go to the other countries of Europe—to Italy, to Germany, and to Austria—you will find the most perfect friendly feeling to this country; and if we come to Russia, we know that only lately the Ministers have told us how friendly were the relations even with that Power, and we have within the last fortnight a declaration from the lips of the Emperor of Russia which shows at least that he is as anxious to be friends with us as we are to be friends with him.

But now the question arises. Our Government is in favour of peace; I ask you then, how comes it, if our Government is so deeply anxious for peace,— how comes it that we meet here to-night under the apprehension that we may be on the brink of war? Let us for a moment consider that question. The difficulty has arisen, as you know, from differences between the Turk—(when I mention the Turk I mean the Government at Constantinople)—differences between the Turk and the victims, or the children of the victims, of four centimes of oppression in the Turkish European provinces, and afterwards between Russia and Turkey, because Russia sympathises with the Christian population of these provinces. You know that the Christians of these provinces are mainly of the same Church and the same faith with the Russians. The Russians are near them, much nearer than we are; they sympathise with them, they have sympathised with them for generations, and when those Christians rise in revolt, it is contrary to human nature that the people of Russia should not sympathise with their coreligionists suffering from the oppressions of the Turks. Well, then, we are afraid of what Russia may do to the Turk on behalf of these Christians, and we back the Turk in opposition to the supposed designs of

Russia. Now, before the Crimean war, which very many of you remember, the Government of Russia had power under treaties to have watchful guard over the condition of these Christian provinces, and to remonstrate if injury was done to them, and oppression beyond a certain point was committed upon them. By the Crimean war Russia was no longer permitted to have that power, and it was supposed to have been transferred to all the Powers of Europe, but in point of fact it was not transferred to anybody. If you would allow me to read to you one of the clauses of the treaty of 1856, which has not been nearly so much commented upon as it ought to have been in the public press, you will see that we struck down Russia as a protector of the Christians in Turkey; but we put nobody in the place of Russia, and from that time to this there has been no protection whatsoever over all that unhappy population. Now, in the treaty is this clause—clause 9,—it says, "His Imperial Majesty the Sultan, having in his constant solicitude for the welfare of his subjects issued a firman"—that is, a decree—"which, while ameliorating their condition, without distinction of religion or race, records his generous intentions towards the Christian population of his empire, and wishing to give a further proof of his sentiments in that respect, has resolved to communicate to the contracting parties"—that is, the other European Powers—"the same firman emanating spontaneously from his sovereign will." And then the treaty goes on to say: "The contracting Powers recognise the high value of this communication. It is clearly understood that it cannot in any case give to the said Powers the right to interfere, either collectively or separately, in the relations of His Majesty the Sultan with his subjects, nor in the internal administration of his empire." And, therefore, Russia being put aside by force of that war, and nobody being put in the place of Russia, you will see that there has been no one to take cognizance of the oppression of these unfortunate populations, and no one to remonstrate with the Porte, and to insist upon a better treatment of them. And then comes the insurrection spreading from one province to another. Then comes the excited sympathy of the Russian people. Then comes the fear of England that something is about to be done unpleasant to its ally, and to its great friend the Turk. And then comes the difficulty in which we find ourselves; and we are not supposed to be about to enter into war, or in any danger of it, with regard to any power except Russia; and with regard to Russia only on this ground, that Russia insists henceforth, spite of the treaty of 1856, spite of the supposed interests of England, that the Christian population shall have a friend, and if the concerted and united Powers of Europe will not be that friend, then Russia itself will take the guardianship of these people as it did before the year 1853.

But why is it we are so alarmed about Russia,—because, as you know, Russia is a long way from us? Round by sea, Russia, by the Black Sea, from us I suppose is fully 3,000 miles. Why should we be so anxious about Russia, and care so much about Turkey? And that is the point upon which I would wish specially to speak to you. Probably all of you have not examined the map of these countries, but many of you know that the capital of Turkey—Constantinople—stands on the shores or banks of a strait called the Bosphorus, and that the Bosphorus is a narrow passage which leads from the Black Sea into a small sea called the Sea of Marmora, and then another strait called the Dardanelles leads from the Sea of Marmora into the Mediterranean Sea; and Constantinople, standing there upon that narrow strait, has the power, if it chooses, and if it has forts sufficient, and guns sufficient, and people sufficient to man them,—it has command of those straits, and the Russian navy, the Russian ships of war, although they are now free in the Black Sea—and Russia may have as many as she chooses in the Black Sea, as England may have as many as she chooses in any sea, the Russian navy is not allowed to pass those straits, nor to enter the Mediterranean. Now, that is just the point upon which all this difficulty arises. England imagines that some great danger will happen to her, that she will lose her predominence in the Mediterranean, or that her route to India will be in some degree molested if a Russian ship of war should come through these straits, and therefore England is anxious to maintain Turkey in its present position, holding the keys of these straits and forbidding any portion of the Russian navy to pass from the Black Sea to the Mediterranean. You see that England—I speak now of England as it has been, and England as represented by the present Administration—England is afraid that if the Turk went out the Russian would come in; and therefore we are driven to this dreadful alternative—that we must support the Turk, with all his crimes, and with all his cruelty; and we must support, as we do practically support, the Mohammedan religion through the whole of that portion of the world. Seven hundred years ago the people of this country, with one of their—as history tells us—one of their heroic kings, joined the Crusades, and went to Palestine for the purpose of liberating the Holy Places from the possession of the infidel and the Mohammedan. Well, now, what do we do? We give the blood and the treasure of England to support this Turkish Government. We place Bethlehem and Calvary and Olivet, through the blood and the treasure of England, and the power over all those vast countries, which are almost a wilderness and a desert, under the Turkish sceptre. We do all this for this simple purpose—to prevent Russia passing by any ships of war from the Black Sea into the Mediterranean.

Now that was the policy which brought about the Crimean war in the year 1854. I will not tell you of the cost of that war. You have heard it often. There is one point of this cost, however, that I observe has not recently been referred to, except in one or two papers where I have seen it noticed. But let every working man remember, if he is old enough, that whilst a loaf of a given size was worth 4d. in the year 1852, before the war,

and before any probability of war appeared, during the two years of the war it rose to 7¼d. or more. Your supplies, of course, from Russia were cut off, and your bread was scarce and dear. Now, gentlemen, let not it be charged upon me that I am asking you to shrink from some public duty because your bread will be dearer. But when you are counting the cost and deliberating what has been done, and what should be done in future, I say that you are bound to take into consideration all the enormous price that you are called upon to pay for any given policy that may be suggested to you.

But then there comes the consideration of the failure of the results of the war. Nobody, I believe, now is of opinion that Turkey was permanently strengthened by it. Her decay has proceeded constantly and rapidly. You have seen occasionally unhappy men whom we have known who have been afflicted with what is called creeping paralysis—the malady which seizes a foot or seizes a hand, which resists all the advice of medicine, which gradually extends itself, laying hold of more and more of the body, until at last the end of these desperate maladies comes, and that is attended by the death of the patient. Turkey has been suffering under this creeping paralysis for a century past. During the last twenty years it has made rapid progress. There is only one thing in which it does not affect the strength of Turkey at all, and that is in the power of Turkey to oppress and to do evil.

I say the policy of the war of 1854, looked back upon from this time, was a policy of misfortune, and of error. And I should like to ask you whether you conceive that it would be consistent with wisdom and justice, or would it be consistent only with ignorance and panic or presumption, that we should turn back to that policy, accept it as if it were good, and re-establish it in the acts of England and her Government in the year 1876. Now, let us examine for a moment the basis from whence this policy springs. I observed the other day—some day, I think, only last week—a paragraph in the leading article of the *Times,* which I should like to read to you. There have been others of the same kind, but this has just occurred to me. It was on November 30th. The *Times* says : "The interest we take in the integrity of the Ottoman Empire has its origin and end in our desire that the balance of power in South-Eastern Europe should not be disarranged." Now, it is supposed that if Russia had ships of war in the Black Sea, as she has, and if they could come to the Mediterranean, as they might do but for the closing of these straits,—that Russia would be more powerful in the Mediterranean—which of course she would, nobody denies that—and that there would be another naval power added to those whose ships are now found in that sea. If the Black Sea fleet came into the Mediterranean there would be one fleet more in the Mediterranean—that is simple and clear. At present Spain has ships of war in the Mediterranean; France has a fleet there whenever she likes; she has a great naval port at Toulon, as you know. Italy has a fleet there. She is building now—very foolishly, to my mind—an enormous ironclad, with a gun which is called a hundred-ton gun, and which is to fire a shot of nearly a ton weight. I say nothing of the wisdom or folly of such ventures. But Italy has a fleet in the Mediterranean, Austria has ships of war there, Turkey has her ships of war there. I ask what would happen—would the sky fall—or would the British flag be lowered and dishonoured for ever—if half-a-dozen, or ten, or two or three, as the case might be, Russian ships of war were permitted freely to navigate these straits—not straits made by Turkey, or made by England, but made by nature—and intended, of course, to be a passage open to all the world between these two great seas, the Mediterranean and the Black Sea. Now, it is a very curious thing, and it is worth considering as a fact, that we who live here, so far off, and who have the biggest fleet in the world—a rather bigger fleet, I believe, than all the rest of the world put together—that we are the only alarmists upon this matter. Nobody cares about it except the English Government. No people believe it has the smallest interest in it except the English people. And I think it may be shown that we have no real interest in it. Other nations have no panic about it, and have no idea of going to war to support the Turks for any such purpose as keeping the Russians blockaded in the Black Sea.

You see in the papers—and it is wonderful how well newspaper writers write about things which they do not understand, or which, if they do understand, they never attempt to explain. It is not so unreasonable as you may think it to be, that men should write well upon what they do not understand. I know there is a clever and amusing American, who was lecturing in this country not long ago, and he said that by-and-by he intended to come back and deliver another series of lectures upon subjects that he knew least about. And, therefore, if he could do that, and be amusing, and get people to pay five shillings a-piece to go and hear him, I do not think it is to the discredit of the newspapers to say they can write about what they do not well understand. Well, the newspapers have been telling you—some of them—that our route to India is greatly concerned in this matter. Our principal route to India now is, as you know, through Egypt. Passengers go by the railway; ships of commerce and of war go by that wonderful canal which the energy of M. Lesseps and the money of Frenchmen made. I should like anybody to tell me how the route to India will be interfered with at all. I don't know exactly how many hundred miles it is from Constantinople to the mouth of the canal, but I should think it must be six or seven hundred miles at least. But it is not very far from Toulon to the mouth of the canal—from the great French naval port—and it is not very far from Spezzia, the Italian naval port; and, of course, if the Turkish people were not a people in a state of decay, I suppose the Turks would put in jeopardy our route to India; and it

would appear as if nobody ought to live or move or have his being anywhere within that portion of the globe who has the smallest chance of lifting a finger or uttering a word against anything which the English Government may choose to do in the Levant. There is one way of securing our route to India, and that is the way that M. Lesseps offered to Europe many years ago—that the canal should be in the possession of the leading Powers of Europe, and should by them by solemn treaty be kept in first-rate order and always open, and open to the ships of all nations who should choose to pass through it. Instead of England buying the canal with the idea of its being a route over which we had some special right, let all the nations of Europe have their interest in it. It would be a bond of union between them, and it might, in fact, in time to come be the cause of a more strict, and generous, and peaceable political union among the nations of Europe than we have seen to exist at any time in the past. Would the English fleet be any less powerful in the Levant if the Russians could come that way? You know that the Russian fleet can come now from the Baltic round through the English Channel and into the Mediterranean by the Straits of Gibraltar, but that is a very long route indeed, exposed to the perils of the sea. It is much more likely that they should wish to have—and perfectly just in my mind they should have—their natural right of passage through these straits, and that they should be open to all the navies of all the nations of the world.

There are some persons who now hear me who read newspapers forty years ago. Carry your minds back to the year 1836, and you may remember that at that time a number of half lunatic and half designing people in this country got up a panic about an invasion of our northern shores from Russia. Russia was to send a fleet from the Baltic through the Sound and to invade this country, and I suppose they had a design in those days of conquering Scotland, and annexing it, no doubt, to the Russian Empire. The Baltic is shut for about half the year by frost. And what happened during the Russian war, when the English fleet went into the Baltic? The Russian fleet did not go out of it, because it could not; but the Russian fleet took shelter behind the fortifications which have been erected at Sweaborg and Cronstadt. They did not come out to meet the English ships, and the English ships dared not attack them within those formidable defences. And yet forty years ago we were told that we were to have an invasion of this country by Russia, and the Government of that day actually added, on the strength of that panic, five thousand men to the roll of the English navy; and so they always add men to the roll of the English navy whenever there is the slightest panic on any matter of this kind. We can make allowance for children in the dark who are afraid, but for a great nation like this, without doubt, in some respects, at this moment the most powerful in the world,—for us to be shaken by these childish and unreasoning panics is a discredit and a humiliation which we have to bear, unfortunately, before the honest but astonished opinion of all other nations.

I have referred to the particular position of Turkey and of Constantinople upon the shores of the Bosphorus. Let me ask you now to look at the peculiar position of Russia on the shores of the Baltic. Russia is a country that for its magnitude, for the breadth and the length of it, as you see it on the map, is more without navigable rivers running to the sea than any other country in the world. Almost all its great rivers run into the Caspian or into the Black Sea, and at present the Black Sea is a sea from which they are not allowed to emerge through the straits of the Bosphorus and the Dardanelles. If you go to the Baltic you find another great sea perhaps nearly as large—I don't know whether it is as large as or larger than the Black Sea, but another great sea, and the only way out of it is through a narrow passage called the Sound, at least the principal way out of it—a passage where the Danes only a few years ago levied a toll upon all ships passing—and the different nations agreed to pay them a sum of three or four millions to abolish that toll and to make the passage free. But the Russians, as you see, are shut by frost in the Baltic nearly half a year, and when the ships come out they have to come out through this narrow passage. I should like to know whether, with that state of things, it is likely that Russia will perpetually consent, as she is blockaded by the frost in the north, to be blockaded by England through the hands of the Turk in the south, and that from no portion of her vast empire should one of her ships be able to pass during half a year on account of the frost, nor any portion of the year from the south at the command of the Government of this country. The thing seems to me intolerable and impossible, and it cannot long be sustained. If we were in that position, what should we do? I have no doubt whatever that there would be an unanimous discovery on the part of all people in England that we had a just claim to go through that only passage; and though I for one should be very much in favour of negotiation, I am afraid that not a small minority—perhaps a large majority—of my countrymen would be determined to enforce that claim by such means as came first to their hands.

Now, I have come to this conclusion long ago—and I say it before this meeting, and before such as may read the proceedings of this meeting—that the Eastern Question, as it is called, is not worth one single farthing to us more than that we should be glad to see freedom everywhere and peace everywhere. It is of no consequence whatever to us as a great political question except just as it affects the admission of Russian ships of war through the Black Sea into the Mediterranean. It is not the possession of Constantinople. If you had ever been at Constantinople, you would know that was not a very formidable business as it is at present.

Constantinople is not a city on wheels, like a multitude of caravans, that can be brought down to the mouth of the Suez Canal. Constantinople is where it has long been, and where it will long remain. It is not territory that can do us any harm, if Russia had any portion of that territory. There is not an intelligent man in Russia, or in Europe, who does not know that the accession of territory to the Russian empire during the last fifty years has, for military purposes, greatly weakened that empire. At this moment, it may be when Russia is about to enter into a war with Turkey upon this question of the Christian populations, are we not all sensible if we look at the map and see the advances of Russia in the direction of the Himalaya mountains and our possessions in India—is it not clear that every soldier she has in all that vast territory—and there are many thousands of them—is so much a weakness to her now when she comes, as she may unfortunately perhaps come, to have a prolonged struggle with the Government at Constantinople? Therefore, we have no interest whatever in the question of Constantinople; none whatever in the question of territory. It is supposed we have an interest in the exclusion of Russian ships of war from the Mediterranean, and that is the pith and kernel of the whole question, and the soul of the dispute which is constantly disturbing the peace of this country. I shall be told—I have been told very often of things I have said on this platform—that "this man is speaking things that are not English and are not patriotic." If I can show, and I believe I am entitled to try to show,—if I can show that there is nothing in this question which affects the interests of England, as your Government and some of your press would persuade you there is, I say I can do no more patriotic act in the face of my countrymen than to save them from these constantly recurring panics, and from the perils which they bring with them, and which surround them; because if I can dispel this terror, if I can so strengthen your nerves that you will no longer tremble at this hobgoblin—well then, I shall have done my little part towards settling what is called this perilous Eastern Question for ever.

Now, I should ask you whether what I suggest is just and reasonable? "Oh!" but many men will say, "we have nothing to do with what is just or reasonable." I had a pamphlet sent me the other day printed in the most elaborate type, and evidently from a man who considers himself a great authority, and it said it had gone through three editions. He says what you call national right is national force. There is no such thing, he says, as national right. It is a question purely of force—of mere men.

A London newspaper editor commenting on the speech I made the other day at Llandudno, said, in effect, "It is all very well for the moralist, but it has very little to do with statesmanship." For my share, I have no wish to be a partner in statesmanship which is dissociated from morals. But I should like to ask you whether, if this thing be just and reasonable in the eye of morals, it is likely that we can long sustain the existing state of things. If Turkey has suffered from this advancing paralysis for twenty years past, do you think she will recover from it in twenty years to come? Does not every man know that Russia is continually advancing in the field of civilization? There are glimpses even in that country of the approaches of freedom to which Russia has heretofore been unaccustomed; and we may rely upon it that while Turkey is constantly diminishing in force Russia is constantly advancing, and that the time may come, the time will come—it may be ten years hence, or it may be twenty years hence,—you may have a war now and a war then—but it is written in the book of fate, and no man can reverse it—when these passages will ultimately and not remotely be open to all nations of the world.

And now let me ask you what other nations think of our conduct in this matter. At this moment we have no promise of assistance in any course we take that leads us to war from our next neighbours the French. In 1854 France went into the war with this country, not because France cared one farthing about the question, but Louis Napoleon thought it of great importance to his dynasty to associate himself with England in the great political transactions of Europe. At this moment, or up to this day—I don't know whether I should say at this moment, for I see it is announced to us there is a resignation of the French Ministry, but I speak of it as if it still existed,—at this moment perhaps France has, at least it has to my mind, the most intelligent and the most honourable Government that I have known since I have been accustomed to political life. They have at the head of affairs a man whom all men trust, and that is a great thing for the head of the State. I will not draw any comparison between the head of the French Government and the head of the administration of this country. Our true head of the State I need not say is as trustworthy as the head of the French Republic, or the head of any Government or State of which we have any record in history. But the Duc Decazes, the French Foreign Minister, since he has been in office has conducted his department with moderation and a wisdom and a sense of justice, I think, that could not be excelled. But the French Government will take no part with us in the pretensions which we make with regard to this great question. Italy in 1854—then the kingdom of Sardinia, which was before united Italy existed—Italy went into the same war with us. But why? For a reason, I will not say that it was the same, and I will not say it was not something better in its result, but I had it from the lips of Count Cavour, who was then the Minister of the Sardinian kingdom, that they went into the war because it was greatly to their interest to associate themselves with England and France, from whom they expected in the future some corresponding advantages. Germany, as you know from the papers within the last day or two, is

neutral in this matter. We are one of the historic allies and friends of Germany. Germany is Protestant, as we are, and that has something to do with our sympathy with Germany; and though we are all, I hope, in favour of as much religious freedom as we can get, and as we can bear, still, I believe that the fact of the Protestantism of Germany makes the alliance between England and Germany more likely and more permanently secure. Then there is Austria. Austria has great diffi- culties of her own. I have a great sympathy with Austria, because for some years past she has made rapid and remarkable strides in an improved and constitutional Government. But Austria has no intention whatsoever of going into this war in the direction which we have been supposed to be likely to go into it.

The fact is, these nations and their Governments have no interest in our pretensions, and they do not feel sympathy with our demands, and what I shall call our presumption with regard to the Mediterranean; they have no interest in the perpetual blockade of Russia in the Black Sea; they have no interest in dooming vast regions under Turkish rule to a perpetual desolation; and I believe they have none whatever in the question now disturbing Europe which would induce them to go to war in connection with it. Now, I believe that our true interest is no greater than theirs; and we have only to examine this question, to take the map of Europe, to look at the Black Sea, to look at the position of Constantinople, to look at the mouth of the Canal, to look at the state of the Baltic, to count how many fleets there are already in the Mediterranean, in order to convince us that the addition of one fleet more can make very little difference. It seems to me we shall come to the conclusion that we have no interest whatsoever in the turmoil which has been created, and that unless we can in conjunction with Russia urge upon Turkey such reforms as are necessary, our duty is to stand aside, and to leave the nations which are the near neighbours of Turkey, and to Russia especially, to do whatever seems possible, and whatever they and she may think best to do.

I don't, as you know, in any case stand forward as the defender of these sanguinary struggles which continually, or at times, take place amongst the nations; but I know not how in some cases they are to be avoided. There can be no arbitration unless the parties to the dispute are willing; there can be no arbitration between such a Government as that which reigns in Constantinople, and that suffering people of whom we have lately heard so much. I only take consolation in the fact, viewing all these tremendous scenes and tremendous sufferings—

"That God from evil still educes good,
Sublime events are rushing to their birth;
Lo! tyrants by their victims are withstood,
And freedom's seed still grows, tho' steeped in blood."

Let us hope, let us pray, that the efforts that are being made—efforts, I believe, that are being made as sincerely by the Emperor of Russia as by the Government of this country—let us hope that these efforts may be crowned with success, and that the storm which has been created, and which threatens to rage around us, may be put an end to, and that tranquility may again speedily prevail. We have sent, as you know—our Government has sent—a special ambassador to Constantinople. Lord Salisbury is a man of whom a good deal may be said against him; and a good deal might honestly he said in his favour. Perhaps that is true of most of us. But with regard to his policy at home, I think I have observed it for many years—and I have watched him and sat opposite to him for many years in the House of Commons—what I should call a haughty un-wisdom that was unfortunate and mischievous. On the other hand, I have seen in his conduct as Minister for India a great liberality and a disposition to do that which he believes to be just. I can only hope that he leaves his un wisdom for home consumption, and that when he arrives in Constantinople his liberality, and his justice, and his strong intellect will have fair play. And I hope he will do his country the highest service and himself the highest honour by the duty which he has undertaken.

But the special Ambassador has been to Paris, to Berlin, to Vienna, and to Rome. He has seen the Duke Decazes, he has seen Prince Bismark, he has seen Count Andrassy, he has seen Signor Melegari at Rome. He has heard what they have to say—if he has been touting for allies and sympathisers, I suspect by this time he knows he has greatly failed to find them. If he will act upon his own strong sense he may do great good. If he acts as the subservient representative of his chief—judging his chief by his own language—then, I think, he may do us a very serious ill.

Conferences are not always certain to lead to peace. In 1853, before the Crimean war, there was a Conference at Vienna, held in August, and the Powers assembled were England, and France, and Austria, and Prussia, to settle the dispute between Russia and Turkey. And they agreed to a note, to an award, to a piece of advice which became historic and celebrated as the Vienna Note. Well, the Vienna Note was sent to Russia, and the Emperor accepted it pure and simple. It was sent to Turkey, and the Turk refused it. It was said—I believe

most untruly—that the Emperor accepted the note in a sense not intended by those who had drawn it up; but it was submitted to our Cabinet at that time, which contained no less than five members who had filled the office of Foreign Secretary, and who therefore ought to have been well acquainted with diplomatic language of that kind. And what happened after all? Turkey had been so inflated and so excited by the fact that two big brothers, France and England, were ready to come to her assistance, that Turkey declared war against Russia, and then England and France went into the war, fighting on the side of Turkey, who had rejected their advice and award, and against the Emperor of Russia, who had distinctly and simply accepted it. Well, this Conference does not mean certainly peace; I wish it did; but if the Conference be not absolutely to be relied upon, what have we to rely upon?

We have two things that are very important to consider, and they are the only two other points to which I will ask your attention for a few moments. England in this matter has no ally. She had France and Sardinia in 1854, and, of course, Turkey, and now if she went to war on behalf of Turkey, of course Turkey would be our ally; but we have no other ally, and I do not see how England is to carry on a continental war without an ally. We have been to France, and France says "No" we have been to Italy, and Italy says "No;" we have been to Germany and to Austria, and they say "No." Our cause, in their eyes, is not so just and so important; or it is not one in which they have so great an interest as to induce them to lend us their sympathy, or to give us their support. Therefore, I look upon it that boasting at the Guildhall how many campaigns we can bear before we are exhausted—before the working men of England are in the condition that they were during the great wars in past times—all that sort of boasting is greatly out of place. The Prime Minister may be a great actor, but somehow or other he seems to me as if he always played rather to the galleries. But we have a better reliance than this, and that is, on the better knowledge of our people. The policy of 1854, as I have described it, is the policy now—the policy which would lead us into war on behalf of Turkey and against the empire of Russia. We have had experience—shall we profit by it or not?

I think I once quoted in this hall, or in some public speech, a passage from the writings of an eminent Frenchman, historian and statesman, the late M. Guizot, which struck me as worth remembering. He says, "A people who can understand and act upon the counsels which God has given it in the past events of its history is safe in the most dangerous crises of its fate." Well, are we not now full of the experience of the war of 1854? If it were necessary I could quote authorities one after another strongly in favour of the view I am taking. The late Lord Aberdeen was Prime Minister when that war was undertaken, and to the last hour of his life, the last hour of his memory, probably there was no other event of his life which he so greatly regretted. Sir James Graham, one of the most capable men in that Ministry, the First Lord of the Admiralty during that war,—he himself, in the most frank manner, said to me, "You were entirely right, and we were entirely wrong." I might quote you the opinions, in his later years, of Lord Russell, who was a member of that Government, and he, in writing since, has endeavoured to show how impolitic the war was, and how it might have been avoided. I might quote Lord Stratford de Redcliffe, who was minister at Constantinople at that time, and himself then, unless he is very much belied, filled with enthusiasm for the Turk. You have read some of his letters, probably, in the *Times* during the last few months; you see how entirely he gives up the whole of the policy which he supported at that time. I might take you to the opinion of one—whose opinion the more I reflect upon it the more I value it—the opinion of my lamented friend, Mr. Cobden. You know that he was at one with me in our objection to that war; but if you want to know how he came to that opinion, how he argued it, and what reason he had for it, I must recommend you to turn back to two at least of the remarkable pamphlets which he wrote and published about forty years ago. In a pamphlet which he published in the year 1836, entitled "England, Ireland, and America," there is this passage. He says : "We have no hesitation in avowing it as our deliberate conviction that not merely Great Britain, but the entire civilized world, will have reason to congratulate itself the moment when that territory again falls beneath the sceptre of any European power whatever. Ages must elapse before its favoured region will become, as it is by nature destined to become, the seat and centre of commerce, civilisation, and true religion; but the first step towards this consummation must be to convert Constantinople again into that which every lover of humanity and peace longs to behold it—the capital of a Christian people." I have been so impressed during the last few weeks by reading over again those pamphlets—pamphlets published when Mr. Cobden was to the public unknown, when he was carrying on his business in Manchester, when he was only about thirty or thirty-two years of age—pamphlets which, I venture to say, have nothing to surpass them in the whole political pamphlet literature of this country—I have been so impressed with them, that, acting with some of my friends who have taken the same view, steps have been taken to have the pamphlet of 1836, entitled "Russia, Turkey, and England," reprinted, and I believe that in the course of some days this week it will be offered for sale, probably at the railway bookstalls and elsewhere. I cannot advise the people of England now, with the experience of the past forty years—with the experience of the war in the Crimea—I cannot point to anything in our whole political literature that will be, at this moment, so healthful and so useful for them to read as the pamphlet to which I have referred.

But one other appeal I must make to you. We have in this country—thanks to what our forefathers have done, and thanks to some things that we have done—we enjoy a large measure of freedom. There is room for it to grow and become still larger; but it is large, and we enjoy it, and I trust we are thankful for it. We are also, as I have aforetime said, in some sense the mother of other free nations. We have planted great nations, free as ourselves, on the continent of North America. There they have grown and become great. We have planted them in Australia, and there they are gradually becoming great. We are planting them in South Africa. Our language, which has become the language of freedom in all the world, is gradually making its way amongst all the educated classes in India; and the time will come—and I trust it is not very remote—when there may be some kind of free institutions established in that country. The lovers of freedom everywhere look to us. The oppressed everywhere turn their eyes to us, and ask for sympathy and wish for help. They feel that they may make this claim upon us; and we, a free people, not only do not deny it, but we freely acknowledge it. Well, then, I put to you a solemn question—a question which you must answer to Heaven, and which you must answer to your children and your posterity—Shall England, shall the might of England again be put forth to sustain so foul a tyranny as that which rules in Constantinople—a tyranny which has dried up realms to deserts—a tyranny which throughout all the wide range of its influence has blasted for centimes past with its withering breath all that is lovely and beautiful in nature, and all that is noble and exalted in man? I ask you, Mr. Chairman—I ask this meeting of my countrymen—I ask every man in the three kingdoms—and, in this case, may I not ask every woman?—what shall be the answer given to this question? And I dare undertake to say there can be only one universal answer from the generous heart of the English people.

Hazell, Watson, and Viney, Printers, London and Aylesbury.

decorative feature

The Political Institutions of America and England.
By Edwin James. !!"What constitutes a state? Not high-raised battlement or laboured mound, Thick wall or moated gate; Not cities proud with spires and turrets crowned; Not bays and broad armed ports, Where laughing at the storm rich navies ride; Not starred and spangled courts. Where low-browed baseness waits perfume to pride. No: men, high-minded men, With powers as far above dull brutes endued In forest, brake, or den, As beasts excel cold rocks and brambles rude; Men, who their duties know, But know their rights, and, knowing, dare maintain." SIR WILLIAM JONES (*Imitation of [unclear: Alcoeus]*).
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The following is the substance of an Address delivered to former Constituents of the Borough of Marylebone, shortly after my return from America.

E. J.

75, ALBANY STREET,
REGENT'S PARK.

The Political Institutions of America and England.

I HAVE, at the request of many of my former constituents, undertaken a task which it is difficult to accomplish.

Imperfect as the sketch of the political institutions of America and England must necessarily be, I venture to think that the time for directing public attention to the subject is opportune.

Many years since the late Mr. Cobden, in a public address to the people of Rochdale, commented on the ignorance existing among those whom he styled the "ruling classes" of England upon the geography, politics, and social relations of America. Eleven years of observation and study passed in that country have impressed me with the conviction that much of that ignorance is still unremoved. Few educated foreigners who have resided in America, and made her political and social condition the subject of examination and research, have given the result of their efforts to the public; and the mere superficial observer, who makes a hurried tour through the United States, and who views everything through a lens of prejudice, too readily dismisses with a sneer the practical working upon a people of a system of government which he has never sufficiently examined, and never perfectly comprehended.

The Americans are a sensitive people—they are proud, and justly proud, of the civil liberty they have achieved—they are proud of their material and industrial prosperity, and proud of the still grander destiny which awaits the future of their country.

The majority of Americans take a prejudiced view of England and her Government, and consider the Monarchical Governments of Europe as so many systems devised for the oppression of the peoples; and while the educated and thoughtful student of England's history feels that he is indebted to her—the sacred mother of freedom—for all the valued institutions he has adopted and now enjoys; for the love of freedom, which her example has bequeathed; those who think but little—and never deeply—upon such subjects, neither appreciate nor understand how the liberties of the English people have been matured under their system of constitutional government.

At this epoch in the history of both nations, when England in her mature age, and America in her giant youth, are interested in the success of a tribunal, the most noble structure the world has seen, for the arbitrament of national differences; it is of the highest importance to perpetuate a cordial and kindly international regard, to which nothing so much conduces as a mutual knowledge and appreciation of the practical operation of the political institutions of either country.

It is impossible to condense within the period allotted to this address, more than a hasty sketch of the great theme I am anxious to illustrate; and I must premise that in speaking of the political institutions of America, I comment only upon the Federal institutions of that country.

Each individual State has its own political institutions—its Governor, its Legislature, its Judiciary. Each has its own written Constitution; and the great object of the National Government was to form these States into a perfect Union.

The Federal Constitution provides that new States may be admitted by Congress into the Union It was foreseen that in the vast territory which belongs to America, by cession and by purchase, new States would spring up, which could not be retained in a state of dependence upon the National Government; and since the date of the Constitution, the majority of the States now forming the Union have been from time to time admitted. Other territories, also, are now fast advancing to the same grade of political dignity.

The Federal Constitution contains some positive prohibitions upon the powers to be exercised by the State Governments. To the General Government are assigned all those powers which relate to the common interests of all the States, as comprising one Confederated nation, whilst to each State are reserved all those powers which may affect or promote its own domestic interests, its power, its prosperity, and its local institutions. Such limitations and restraints imposed upon each State Government prevent its interference with the authority of the National Government, and are considered indispensable to secure the harmonious operation of the Union.

On the 4th July, 1776, thirteen of the American Colonies met and declared themselves free and independent of the British Crown. They had asserted in their memorable Bill of Rights their grievances and their prerogatives, the violation of which by the English Government constituted the main grounds upon which the American Revolution was founded; and the grievances under which the colonies laboured being persisted in, a resort to arms was the result. These events belong to the department of history; and I would earnestly implore those of my hearers who have the time and opportunity to study those events, and to learn from the exalted patriotism and wisdom which animated the men who acted in that great drama, the lesson, that a patriot is not necessarily a demagogue nor revolution synonymous with anarchy.

At the earliest dawn of their great revolution, now nearly a century since, the noblest minds of the United States were employed in the important task of eliminating the leading principles which regulated the republics of ancient and modern times, and adapting them to the formation of a system of government, of the people, by the people, and for the people. Hamilton, Jay, and Madison, contributed to the "*Federalist*" a series of essays which may fairly be ranked among the ablest and most eloquent state papers that were ever conceived by the wisdom of antiquity, or the most enlightened of modern governments. In language unsurpassed in the palmiest days of English literature, they pointed out with singular tact and perspicuity, the good and bad points alike in the constitution of the Greek republics. The sober judgment of the Anglo-Saxon fathers of American Independence, undazzled by the eloquence of the philosophers, the orators, and the poets of Greece, pointed out what constituted the statesmanship, or the ruling ideas of the statesmanship, of the great historic republics, how they rose and how they fell. They warned the American people in the infancy of their freedom against the utopian idea that republics were necessarily all that was peaceful and tolerant and just to their own citizens and foreign nations. They instanced Sparta, Athens, Rome, and Carthage, and, in more recent times, Venice, and the United States of Holland, as showing that republics were as much engaged in wars, offensive and defensive, as monarchies; that they were subject to the same influences, interests, and passion, love of wealth and of national ambition, the powerful incentives and motives of aggression. Athens and Carthage were commercial republics; the former was engaged in contest with Sicily for that commanding entrepot of the Mediterranean; the latter played the same game of hostile ambition in the same arena, and exciting the jealousy of Rome by her

conquests and colonisation of southern Spain, fought with that great people a succession of wars with no other motive than to crush the power of her rival, and maintain her own commercial, supremacy. Venice, by her aggressive commercial ambition, caused the League of Cambray to be arrayed against her, and Germany, France, and Italy to combine at last to crush her overgrowing power.

Above all the examples of ancient or modem republican institutions, the founders of the United States Republic seem to have had in serious contemplation that of the old Lycian Democracy. This was a Confederate Republic, the territory of which was situated on the southern coast of Asia Minor, and was bounded in that direction by the Mediterranean Sea. It was a union of twenty-three cities, under one chief magistrate, a certain number of judges, and inferior magistrates, and a general assembly of popular deputies, in which the cities were represented, according to their population respectively, the six larger sending three deputies, the six second class two, and the remaining cities one. From time immemorial the Lycians enjoyed a democratic character, and cherished the traditions of freedom. Under various foreign masters, the Persian, the Macedonian, and the Roman, they were permitted to enjoy their municipal independence to a great extent; but it was not until about the close of the great Roman Civil War that under the sanction and protection of Marc Antony, who pitied them for the extraordinary sufferings which they had undergone at the hands of Brutus and his soldiery, they constituted themselves into that perfect republic, which challenged the admiration of the great French authority on international law and political philosophy, Montesquieu, and was honoured by the adoption, in many respects, of the founders of the great American commonwealth. The Lycians had the pregnant history and fate of the earlier Grecian republics, within a day's sail of their coast, before them, which warned them against the fatal dangers of separate independencies within one state, independent only in name, and against the delusion of such vain compacts as the Achaian League, when the seeds of native degeneration had already produced the fruits of mutual jealousy and treachery, and the waves of foreign conquest were closing around the parent soil of Hellas.

Lycia was an inviolate land and an independent republic, framed for the most part as the great American commonwealth was afterwards constituted; and it worked well, without any interruption to its internal peace, its great commercial prosperity, and its complete political independence, during the reigns of the first three of the Roman emperors. In the reign of Claudian the corruption of wealth and the same growth of faction, which seems to have flourished most powerfully in all republican soils, brought down to the dust, within the space of a single century, those great and beneficent institutions, which, if not the noblest, must be ranked amongst the noblest that were ever conceived and developed for the government of mankind. Lycia, which, in aid of the Grecian cities, formerly bad sent fifty ships to the Battle of Salamis, and which, had it preserved its political independence, must have arrived at a point of commercial prosperity equal to that of the old Phœnicians, or rivalled the universal trade of Venice, was broken up by the selfish folly, internecine factiousness, and unmitigated corruption of its own sons, reduced to be a department of a Roman province, and governed by the prefect of a proconsul, as it is at this day by a second- class Turkish governor. Its fine sea-board, in front of which thousands of rich argosies sailed up and down in the old classic time, re-echoes to the dull plashing on its melancholy strand of the idle Mediterranean wave. Its picturesque and fertile valleys, and its classic rivers—the rivers of the Homeric poems—feed and water the flocks and herds of a few thousand nomadic Turks, who lead the life of the lotos-eaters, wishing only for the bare means of procuring the necessaries of life, and satisfied with less of these than even the most primitive of the surrounding populations.

The examples of history which I have here alluded to were aptly cited to prove that republics were not exempt from jealousies, political intrigues, selfishness, and exclusiveness; and the great statesmen and publicists who watched over the cradle of American liberty and fostered it into manhood, after many years of anxiety and incessant labour, and, after encountering much opposition, devised a modified system of republican government. This, while it secured to every state its individual, local, and domestic rights, and accorded to them their individual legislatures, established a national and central authority, created by the will of the people, to control and regulate all that pertained to the national interests and policy.

The problem was a complex and difficult one.

The attributes of the Federal Government were carefully defined, and all that was not included amongst them was declared to remain to the governments of the several States.

You are probably aware, as a matter of history, that Articles of Confederation had in the first instance been adopted.

In November, 1777, a frame of government contained in Articles of Confederation, was agreed upon in a continental congress, and sent to the then existing States for their approval and adoption.

They were not to go into operation until the consent of all the States had been obtained, which occasioned a delay of nearly three years, the consent and approval of the State of Maryland not having been given until March, 1781, when the Confederation was finally adopted.

The deficiency in this Confederation of powers to regulate commerce, to impose national taxes, and to

collect revenue for the public service, with other causes, brought about almost national bankruptcy; the national treasury was empty; the credit of the confederacy was ruined; the public faith was utterly prostrated; jealousies and rivalries in commerce, in agriculture and manufactures, between the various States sprung up; they adopted a system of retaliatory legislation; the danger of war between them became at one time imminent, and the peace and safety of the Union were made dependent upon measures of the several States, over which the general government had not the slightest control. Navigation and trade were paralysed, and national ruin was the result. Left without powers and without resources, the Confederation would have expired of its own debility; and the question which then presented itself to the attention of American statesmen was whether a more efficient system of government could be devised, or whether the great interests of the young republic should be buried in the ruins of the structure which had been raised to perpetuate its freedom.

On the 17th September, 1787, the present constitution of the United States was framed, and on the 6th April, 1788, the assent of the requisite number of States having been obtained, George Washington was unanimously elected the first President of the United States of America.

You will thus see that Republics are not so readily created. The formation of its present government occupied a period of eleven years of trials, opposition, and jealousies; it involved difficulties and sacrifices of opinion, endless concessions, and many compromises; it required all the wisdom, the patriotism, and the genius of America's greatest statesmen to achieve the triumph of Liberty—Liberty regulated by law, and subservient to authority.

Chief-Justice Story thus eloquently speaks of the completion of this grand work :—

"To those great men, who thus framed the Constitution, and secured the adoption of it, we owe a debt of gratitude, which can scarcely be repaid. It was not then, as it is now, looked upon from the blessings, which, under the guidance of Divine Providence, it has bestowed, with general favour and affection. On the contrary, many of those pure and disinterested patriots who stood forth, the firm advocates of its principles, did so at the expense of their existing popularity. They felt that they had a higher duty to perform than to flatter the prejudices of the people, or to subserve selfish, or sectional, or local interests. Many of them went to their graves without the soothing consolation that their services and their sacrifices were duly appreciated. They scorned every attempt to rise to power and influence by the common arts of demagogues; and they were content to trust their characters and their conduct to the deliberate judgment of posterity.

"Upon a close survey of their labours, as developed in the actual structure of the Constitution, we shall have reason to admire their wisdom and forecast, to observe their profound love of liberty, and to trace their deep sense of the value of political responsibility, and their anxiety, above all things, to give perpetuity as well as energy to the republican institutions of their country. Then, indeed, will our gratitude kindle into a holier reverence, and their memories will be cherished among those of the noblest benefactors of man-kind."

In the formation of their Government the Americans had many advantages. Though young in the science of government, they were adults in freedom. Municipal government, trial by jury, freedom of the press, and all the valued popular institutions for which England had struggled for centuries, and achieved, had been long cherished amongst them, and stood ready for their re-adoption. They were not actuated by the turbulent passions of anarchy, but by a reflecting predilection for freedom. There existed no desire to attack the principles of social order, but the spirit of independence was subservient to, and regulated by, the popular will.

Upon a review of the Constitution of the United States, it will be at once observed that its structure contains a fundamental separation of the three great departments of government—the Legislative, the Executive, and the Judicial; and in the remarks I have to make in order, in such an imperfect and hasty sketch, to present the subject more prominently to your attention, I transpose these departments of governments, and allude, in the first instance, to the Executive, the President, his Election, and the Powers with which he is intrusted by, and exercises under, the Constitution.

What is the best constitution for the Executive department, and what power should be confided by the people to it, is one of the most difficult problems to solve in the theory of free governments. It is an indispensable element in a republican form of Government that the representative of the executive power should be subject to the will of the nation.

The President is elected for four years, and may be re-elected. He is not elected directly by the vote of the people, but a special electoral power is created by the constitution for such purpose. It was thought that the appointment of a special electoral body would secure more deliberation and be attended by less excitement in the choice of a President, than a popular election. Every State names a certain number of electors, as many as it sends members to Congress. The vote is by ballot. President and Vice-president are elected. The majority of the States and not the majority of the Electors decides the question; so that the smallest State has the same influence in the election as the largest. Distinct lists of the candidates voted for are transmitted to the seat of government, directed to the President of the Senate. The votes are then counted, and if a majority of votes, which is essential to the election, is found, the person so voted for is declared to be duly elected President. If

such a majority does not exist, the House of Representatives elect by ballot a President from any three persons having the highest numbers. Since the formation of the Government, the House of Representatives has been required to act in the Presidential election upon two occasions only.

Since the election of Mr. Jefferson in 1801, it certainly has happened that the office of President has fallen to the lot of comparatively inferior men. The President is not, in any sense, the unbiassed choice of the People or of the States. He becomes by this mode of election, the representative of a clique far more than of the whole people. The electors go to the election, pledged to some favourite of their party; before their appointment they are frequently so pledged They elect a mere subservient instrument, one who has adopted their own views upon questions of national policy, one whom they can, or think they can, mould to subserve their own interests in his future administration, who will gratify their own political prejudices and resentment, and not unfrequently one from whom they expect material demonstrations of gratitude in the distribution of the vast patronage which they have helped their candidate to secure. Some of the ablest politicians and statesmen of America have expressed their opinion that this mode of election of the President is unsatisfactory; and that there exists danger that the office may be filled by those who will fail to fulfil the high destiny contemplated by the constitution, and be the impartial supporters, patrons and friends of the interests of the whole country.

The President is elected for the term of four years, a period now considered by many statesmen as too brief.

Upon the question of the frequency of these Presidential elections, many diverse opinions are entertained in America. The epoch of the next election is anticipated immediately upon the conclusion of its predecessor. Who is to be the next President is the subject of national discussion, almost before the newly-elected one has been sworn into office. For a long time before the election it becomes the all engrossing topic. The newspapers place their favourite aspirants in large type for months, and sometimes years, before the event. Political parties are formed, strongly interested in the success of their respective candidates; the activity of intrigue and the excitement of the people gradually increase as the event approaches; and the whole nation considers it a crisis in its very existence.

If a President seeks re-election, as is at this moment the case, he governs more to secure that object than for the interests of the people; he is absorbed by the cares of self-defence; his patronage is bestowed to obtain votes and political adherents; and he is tempted to sacrifice the best interests of the country to find favour with the majority.

It has been truly observed that few of the nations of Europe could escape the calamity of anarchy and civil war if they had to elect a new Sovereign every four years of their national existence.

The frequency of political elections in America for representatives in Congress, for their State Legislatures, for governors, and for their municipal government, have accustomed them to every species of electoral agitation, and the storm which in other countries would sweep away in its force institutions and landmarks, and produce universal chaos, passes harmlessly over the American people, and after the fury of the political whirlwind has been spent, all is again tranquil:

"Concidunt venti; fugiuntque nubes;
Et minax, quod Dî voluere, ponto
Unda recumbit!"

In contrasting the power and the political functions of the Presidents with those of the monarchy of England, marked differences exist; but in some respects it will be seen that the influence of the popular will is more direct and immediate in its action and control upon the Crown than upon the American Executive.

It is an established axiom that a constitutional monarch cannot govern when opposed by the two branches of the Legislature. The experiment cost one monarch his head, and another his throne. The President, when his administration is opposed by the majority of Congress, does not lose his supreme power, but can continue to exercise it in defiance of the Legislature until the end of his term of office. He is irremovable, except by the process of impeachment; and several Presidents have so governed in spite of the opposition of the National Legislature. The responsible ministers of the President are excluded from Congress. No vote of censure or want of confidence necessarily removes them. The President can retain, and has retained, an administration adverse to the will of the people until the expiration of his term of office. The Legislative power can pass laws over his veto, which he is bound to execute; but he can execute them under the advice and with the assistance of an administration which, however unpopular, is irremovable by legal and constitutional means. In this respect his office is an autocracy; he can select an obnoxious minister and retain him; and, if the President be obstinate, no parliamentary censure can effect such minister's dismissal.

In England the expression of the popular will at a public meeting has annihilated the Queen's administration; in America no such result can happen.

The exclusion of the responsible advisers of the Executive from Congress, where they would be subject to immediate Parliamentary action and control, has been deemed by many statesmen a great defect in their constitution, and in that which was framed by the Southern States at the commencement of their secession,

called the "Montgomery Constitution," from the place where the Convention assembled, the ministers, *ex officio*, were to have seats in the National Legislature. The powers of the President in administering the Government are limited, and subject to the control of, and ratification by, the Senate in many important particulars.

He can make no treaty with foreign nations but with the concurrence of two-thirds of the Senate, the Senate, as will be seen presently, representing all the States of the Union. The power of appointment to offices, one of the most important and delicate in a republican government, and one which has been watched in the Constitution with great vigilance, is not confided to the President alone : the action and consent of the Senate is required.

The patronage of the President is now enormous, and has become a dominant feature in the operation of the national Government. The subordinate officers in the Post Office and Customs departments alone, all derive their appointments directly or indirectly from the President, and continue in office only during his pleasure. Most of them, in fact, give place to new incumbents upon every change of administration; and consequently, the influence of the executive, through the number of places at its disposal, has become so excessive, as to imperil both the moral character and the stability of the republic.

In the public press the President is charged almost daily with nepotism and the corrupt exercise of his vast irresponsible power.

In all important executive acts, I may say that he is directly or indirectly subject to the control of the Legislature. He cannot prevent any law being passed; nor can he evade the obligation of enforcing its execution.

No law can be passed in England without the express assent of the Crown; but a veto by the Crown of any law passed by the Legislature is almost without precedent in modern times. In America it frequently occurs, that a law is passed over the President's veto.

In the exercise of his political power, the President uses his own discretion, and is accountable only to his country and his conscience. His decision in relation to the powers intrusted to him when exercised is conclusive.

Such is a sketch, and a mere sketch, of the Executive power of the United States.

The Legislative department of the United States, consists of the Senate, and the House of Representatives.

The Federal Constitution as well as the State Constitutions divide the Legislative body into two branches. Both these houses originate from the choice of the people; but the conditions of eligibility and the mode of election are not identical.

The necessity of a Senate was indicated by the propensity of all single and numerous assemblies to yield to the impulse of sudden and violent passions, and of their liability to be seduced by faction into intemperate legislation. It was thought that a Senate duly constituted would operate as a salutary check upon the Representatives; and history was appealed to for the precedent, that no republic lived long which had not an Upper House.

The experiment of establishing a single House of Assembly was attempted in Pennsylvania; and Franklin, the great advocate of the sovereignty of the people, concurred in the attempt. After a brief trial, however, the law was changed, and two Houses were created. Thus the principle of the division of the Legislative power was finally established, and its necessity may be regarded as an axiom in the science of Republican Government.

The Senate is chosen by the Legislature of each State. Each State being entitled to two Senators; so that every State of the Union, large or small, has the same electoral power in the Constitution of the Senate.

The term of service of the Senators is six years.

The qualifications for a Senator are—he must be 30 years of age, must have been nine years a Citizen of the United States, and must be an inhabitant of the State for which he is elected.

Although the period for which a Senator is elected is six, the Constitution provides for a change of one-third of the members every two years.

The Senate consists of 74 members, the majority of whom by profession are Lawyers; there is one Clergyman, and the rest are Merchants, and gentlemen engaged in Trade and Agriculture.

The names of Webster, Clay, Calhoun, Henry, Seward, have immortalized the Senate, and given it a character for Parliamentary eloquence of the highest order. From its constitution, its tendency is Conservative; and I doubt whether any assembly in the world surpasses it for the experience and deliberative wisdom, brought to bear upon the discussion of political questions.

The functions of the House of Representatives are purely legislative, while the Senate co-operates in the work of legislation. In addition, the latter acts jointly with the President, as the Great Executive Council of the Nation.

The Constitution prescribes "That the Senators and Representatives shall receive a compensation for their services to be ascertained by law and paid out of the Treasury of the United States!" If I remember rightly, the

amount of compensation to each Senator and Representative, is now five thousand dollars, or one thousand pounds sterling for each Session.

In contrasting the political power of the Senate with that of the Upper Branch of the English Legislature, it may be remarked that in one important element, viz., that of national taxation, the Senate is invested with more authority than the House of Lords. By the Constitution, all bills for raising revenue must originate in the House of Representatives; but the Senate may propose or concur with amendments, as in other bills. This clause had its origin in the known rule of the English Parliament, that all money bills should originate in the House of Commons. So jealous are the Commons of this inestimable privilege, that they will not suffer the House of Lords to make any alteration or amendment in a money bill. Two great principles are involved in the rule—one, that all taxes and supplies raised from the people should originate with the representatives of the people; and the other, that the popular branch of the Legislature, acquiring a permanent importance in the Government, should be able to counterpoise the influence of an assembly having hereditary rights and dignity. It was thought by the framers of the American Constitution, that the same reasons did not apply with the same force to a republican form of Government, and as direct taxes are, and must, be apportioned amongst the States according to the ratio of their population, a power to amend such laws was reserved to the Senate, where all the States possess an equal voice. Thus the due influence of all the States is preserved over a matter of such vital importance.

England is governed by an hereditary Sovereign, ruling with limited powers, and bound to summon and consult a Parliament, comprising hereditary Peers and the Representatives of the people.

The necessity for a second Chamber in a system of Parliamentary Government is universally admitted, and such Chamber must not be a mere duplicate of the more popular assembly.

If elective, like the American Senate, it would be chosen by a more limited class of voters than that which elects the House of Commons; and it is a question whether an Upper House so elected in England would not be more oligarchical and more obstructive to rational reforms than the present House of Lords can constitutionally be.

The House of Lords is subject to more constitutional checks by popular influences than the American Senate. Upon the advice of the responsible ministers of the Crown, the prerogative of creating new Peers, is one effective controlling power. Oxford and Bolingbroke created twelve in a single day; and, "if that will not do," said they, "we will give them another dozen."

During the last forty years, one hundred and seventy-six Peers have been created, the Upper House being thus recruited from the ranks of the Commons of England.

Although the Senate of the United States has seldom arrayed itself in opposition to the passing of measures demanded by the popular will, it has the constitutional power to do so for the term of its existence; and no influence or control emanating directly from the people can enforce concession.

On the contrary, the House of Lords in the conflicts which have arisen between their order and the people represented by the Lower House, have invariably upon great questions, when the will of the people has been unmistakably declared, given way.

The constitutional mode of dealing with a refractory House of Commons is by a Dissolution.

There are two modes in the English system of representative government of securing the co-operation of the upper branch of the Legislature with measures upon which the national will has been expressed, and which have been passed by the House of Commons. One is by the creation of new peers, to which I have before alluded; and the other by a Dissolution of the Parliament, and appealing to the country upon the question in conflict between the two Houses.

These conflicts, at different epochs in our history, are replete with dramatic situations and details; and to the threats of a final appeal to the people the boldest champions of the peerage have felt that they had no alternative but to concede. In the year 1700 a memorable struggle occurred, when a Bill was introduced in the Commons for annulling the royal grants of forfeited property, and was sent up to the Lords coupled with a money Bill. The Lords passed amendments; the Commons rejected them; the Lords passed them a second time; they were again rejected by the Commons; and the Bill was sent back with a threatening intimation that it *must* pass. The hero of Blenheim counselled concession. Better pass a bad bill than provoke a revolution or civil war.

This is substantially the same argument by which the victor of Waterloo persuaded the Lords to pass the Reform Bill; and when the Bill for the abolition of the Corn Laws was sent from the Commons, and was awaiting the decision of the Lords, he told a protectionist peer, "You cannot have so bad an opinion of the Bill as I have; but it was recommended from the Throne; it was passed in the Commons by a large majority; and we must all vote for it—the Queen's Government must be supported."

The Commons had been less ceremonious in dealing with Bills which the Lords had sent to them for their consideration. In 1772 Burke complained to the House that he had been kept waiting three hours at the door of the Lords with a Bill sent up from the Commons; their indignation was roused, and waiting their opportunity,

the next Bill sent to them was rejected unanimously. Not content, moreover, with this legislative triumph, the Speaker threw the Bill from his chair upon the floor, and a large number of the members rushed forward and kicked it through the door of the House.

The influence of the popular will upon our Upper Hereditary Chamber has a tendency to increase, from the vast political power now placed, and justly placed, in the hands of the people. In a very recent debate, when a vote of censure upon the Administration was proposed in the House of Lords, the Lord Chancellor intimated that such a vote might be neutralized by the House of Commons—"But, my Lords, I tell you plainly I will hold my ground, I will not quail; at all events, until the House of Commons shall censure me for what I have done."

A vote by the House of Lords of censure or want of confidence in the Queen's Administration, could be neutralized by a vote of approval and confidence by the House of Commons. The people, by their representatives, can thus check, if not absolutely control by constitutional means, the political power of the Hereditary Chamber.

It may be that the authority of the Hereditary Assembly will decline before the increasing importance and power of the House of Commons; but there can exist no fear that the popular influence upon the House of Lords will be diminished.

The second branch of the American Legislature—the House of Representatives—is elected by the direct vote of the people.

The principle of the independence of the States triumphed in the formation of the Senate, and that of the sovereignty of the nation in the composition of the House of Representatives.

The qualifications of the electors in the first instance varied in the different States. The Constitution prescribes that the electors in each state shall have the qualifications requisite for electors of the most numerous branch of the State Legislature. The peculiar wishes of each State in the formation of its own popular branch were thus consulted.

In some of the States only freeholders were entitled to vote; in others only freemen; in others a property qualification was required; in others the payment of taxes; and in some of the States the right of suffrage was almost universal.

These qualifications have from time to time been altered and modified by the different States, and the qualification for an elector of a Representative to Congress is now merely residential.

Most of the States have a law of registration, requiring that the Elector must register his name and place of residence, so many days or weeks before the Election.

No period of occupation is prescribed; no payment of rates or assessments is required; and no amount of rental is necessary to constitute the qualification.

In the State of Massachussetts, an educational test is applied.

The votes are taken by ballot.

The number of representatives of each State is proportioned to its population.

The Constitution declares that the number of representatives shall not exceed one for every thirty thousand of the population of each State; and each State is to have, at the least, one representative in Congress.

In order to carry into effect this principle of apportionment, it was necessary that some provision should be made for ascertaining at stated times, the population of each State. Unless this was done, it is obvious that as the growth of the different States would be in very unequal proportions, the representation would soon be marked by corresponding inequality. For instance, the State of Delaware sent one member to the first Congress, and sends no more now, while the State of New York, which then sent six representatives, now sends thirty-two.

A new enumeration of the inhabitants of all the States is taken every ten years, which is called the decennial census.

The Constitution decided that there should not be more than one representative for every 30,000 persons; but no minimum was fixed upon. An Act passed by Congress in 1852, fixes the proportion of representatives for each State, at one for 93,423 of the population, and made the House then consist of two hundred and thirty-four members.

The recent Congressional apportionment, based upon the last census, fixes the present number of representatives at two hundred and eighty-three.

The voting population of the United States, tested by the votes for the Presidential Election of 1868, is about 5,716,788.

It may be stated as an historical fact, that in every apportionment hitherto made of representatives, whatever has been the number of inhabitants assumed as the ratio to govern the number of representatives—whether thirty thousand or any higher number—there has always been a fraction in each State less than that number, and therefore an unrepresented fraction. In some of the States this number has been small; in others very large; and in others intermediate numbers, varying from each other: so that, in fact, there never has been any

representation of each State apportioned in exact proportion to its numbers as the Constitution requires. The rule adopted has been, to assume a particular number of inhabitants as the ratio to give a single representative, and to give to each State as many representatives as its population contained of that ratio or particular number, and to disregard all fractions below that ratio.

The term for which the representatives are elected is two years; and the only qualifications required are—to have attained the age of twenty-five years; to have been seven years a citizen of the United States; and to be an inhabitant of the State for which he is elected.

The period of election of members to the State Legislatures is one year; but the relative duties of a member of a State Legislature and those of a member of Congress differ essentially.

In a single State the habits, manners, institutions, and laws are uniform, and all the citizens are more or less conversant with them. But in the legislation of a national Parliament, large and enlightened views, comprehensive information, and a great attention to the local interests, products, and employments of all the States of the Union, are absolutely indispensable qualifications for a member of Congress.

Continual fluctuations in the public councils, and perpetual changes of the members, would be most unfavourable to the acquirement of sufficient knowledge for the public welfare.

Upon a vacancy occurring in the representation of any State, the executive of that State has the right of issuing the writ of election to fill such vacancy. There existed a jealousy in confiding this power to the National Government, and it was thought that the State which thus became unrepresented, would have stronger motives to act promptly in such an emergency than the Government.

Adopting the practice of the English Parliament, the Speaker is elected by the House upon their assembling after a new election; but no approval of their choice is required by the President as is necessary by the Crown in England.

Following the same precedent, the power of impeachment is confided by the Constitution solely to the House of Representatives, and the right to try such impeachments is vested in the Senate.

I have observed that the influence of the popular will is not so immediate or direct in its action upon the American Senate, as it is upon the upper branch of our Legislature, and the same observation will to some extent apply to the House of Representatives. They represent, of course, the national will as signified by their election; but upon great questions arising during their period of office, and in the event of their opposition to popular measures, there is no power of dissolution of their assembly, nor any appeal to the people.

The influence of the House of Representatives upon the Government and its policy has comparatively little effect. A vote of want of confidence in the President or his administration has been upon some occasions attempted, but has invariably failed to produce any result. They have the constitutional power of stopping the supplies, and thus paralysing the machinery of the Government, but this has never been yet resorted to. They can embarrass the Government, but they cannot enforce by constitutional means a change of policy.

Some statesmen have not hesitated to express an opinion that the object of those who framed the Constitution was to subject the popular will to limits and restraints, and that a feeling of distrust of popular power influenced those who assumed the formation of the National Government.

A Parliamentary majority in the House of Representatives is not essential to the administration in carrying on the Government, as in England; and hence it follows, that debates in the Legislature upon great questions of national policy, involving the fate of ministries, seldom or never take place.

In America, the absence of popular interest in the debates of Congress is observable; they are published in the newspapers in a condensed form, and comparatively but little read.

Every State having its own Legislature, and the people being more immediately interested in what concerns their individual and material interests, their local taxation, and their domestic institutions, their attention is more absorbed by such questions; and the proceedings of the national Legislature assume in their consideration secondary importance.

The constituences, divided into congressional districts, are large, and by the apportionment of representatives to the population, to which I have before alluded, are nearly equal in numbers.

The legitimate expenses of the election, the machinery of the ballot, the scrutiny of the votes, the voting departments, the cost of the officers employed in taking the votes and publishing the returns, are borne by the electoral districts, and do not fall upon the candidates. Large sums are, however, spent by candidates in many instances; and an election for Congress in New York has cost an aspirant five thousand pounds.

Having alluded to the Executive and Legislative departments of the Government of the United States, I must not omit to mention the remaining co-ordinate department established by the Constitution, which is termed The Judiciary, and it is thus created: "The Judicial Tower of the United States shall be vested in one supreme court, and in such inferior courts as the Congress may from time to time ordain and establish."

The judicial organization of the United States is an institution which a stranger has the greatest difficulty in understanding.

The Constitution being a written Constitution, a law which violates any one of its provisions is void; and it was therefore necessary to create a judicial department to ascertain and decide all questions which might arise upon this important subject.

In England the Judges cannot be invested with the right of resisting the decisions of the legislature; because the Parliament which makes the Laws, also makes the constitution; and consequently a law emanating from the three estates of the realm cannot in any case be unconstitutional. But this is not so in America. The Constitution of the United States represents the will of the whole people—it is the organic law—a compact between the people and the Government; it controls the legislator as much as the private citizen; and the tribunals must obey the Constitution and its provisions in preference to any other law. Those who framed the Constitution, having these principles in view, unanimously adopted two fundamental propositions: first, the establishment of the National Judiciary; and secondly, that it should possess powers co-extensive with those of the legislative department.

The judicial department is deemed to be by far the most important of all the branches of the public service. With no legislative power or partisan influence, its sphere is confined to the execution of the weighty trusts devolved upon it by the government on the one side and the people on the other. It is an umpire with the power to enforce existing laws.

The Supreme Court of the United States is a tribunal with exclusive power to determine, not merely the rights of litigant parties in a suit, but the constitutionality of all federal laws which shall be brought before it for enforcement. In this respect the "Judicial Power," as it is denominated, is intrusted with the very highest political functions. It is as much its duty to interdict the enforcement of illegal acts, as to execute those which are legal.

The Government of the United States assigns to different departments their respective powers. Those of the legislature are defined and limited, and that those limits should not be transcended the Constitution is written. That compact forms the fundamental and paramount law of the nation; and consequently, the theory of every such government must be, that an act of the legislature repugnant to such Constitution is void.

Specific trusts are confided to the Judiciary, viz.: To decide upon all cases arising under the Constitution; on cases affecting ambassadors and other public ministers; on cases of admiralty jurisdiction; on all controversies to which the Government is party; on controversies between states; on controversies between a State and the citizen of another, and between citizens of different States; and between a State and citizens thereof, and foreign States, citizens, and subjects. The questions under these different sections, which have arisen and are constantly arising, can be readily surmised; and it is due to that great tribunal to say, that it is administered by men of profound learning and incorruptible integrity, and that its decisions have commanded universal confidence and respect.

The Judges of the Federal Courts are not, like many of the State Judges, elected by the people, but are appointed by the President, and hold their office during good behaviour. They are thus placed above popular influence. To secure the independence of the Judicial tribunal, permanency of office is essential; and the experience of England affords an illustrious comment on the excellence of the institution.

The Constitution of America was confessedly a new experiment in the history of nations. A government which has no prescribed mode of adaptation to suit the necessities and interests of the people will degenerate into a despotism, or become utterly effete and useless. In a republic especially, peaceable and constitutional means should be provided for altering and improving the structure, as time and experience may show to be necessary for the public safety and the happiness of the people. While the Constitution provided for such changes, it was important that they should not be too frequent nor too easily made. A government constantly changing and changeable is in a perpetual state of internal agitation, and incapable of steady and permanent operations. It has a constant tendency to confusion and anarchy.

The Constitution has provided for amendments being made; the mode is easy, and secures due deliberation and caution. Congress, or a convention of the States, may propose amendments. But, in any amendment proposed by Congress, two-thirds of both Houses must concur; and no convention to amend can be assembled, except upon the application of two-thirds of all the States. When amendments are proposed in either way, the assent of three-fourths of all the States is necessary to their ratification.

Various amendments have from time to time been made, and pre-eminently those since the War of Secession, which, as a natural sequence of that great conflict, secure equal liberty, social and political, to the emancipated coloured population.

The attempted secession of the Southern States from the great compact, subjected the Constitution to a severe trial. Fanatical discussion, sectional jealousies, and local ambition culminated at length in the delirium of Secession. It was not, as was said by many of the statesmen and politicians of Europe, that representative democracy was involved in the contest, but the federal principle; and the real issue was whether the bond was strong enough to hold indissolubly together a confederacy so populous and extensive, of such diverse interests

and pursuits, as to form in the aggregate, one of the largest and most powerful empires that the world has known.

The Rebellion—which checked the material prosperity of the nation, caused the expenditure of millions of treasure and an enormous and unprecedented sacrifice of life—has served to demonstrate and triumphantly assert the vast power and resources, and the resistless authority of the government of America. The Constitution has been vindicated and the States are again in union.

The Constitution of England, unlike that of America, is unwritten. It consists of the whole body of the public law, consuetudinary as well as statutory, which has grown up during the course of ages, and is continually being modified by the action of the general will as interpreted and expressed by the parliamentary representatives of the nation. It is not to be found upon a sheet of parchment, nor can it be produced in full written form, but is evolved from our history, our laws and institutions based upon certain fundamental political rules to be traced from the earliest periods of our nationality to the present hour; expanding and adapting themselves to the progress of society and civilization; advancing and varying in development, but still essentially the same in substance and in spirit. It has had a slow but sure and healthy growth. Unlike the government of America, which consists of a simple compact of so many independent states created by a body of representatives, the constitution of England has been the laborious and patient work of centuries, its progress evolving principles of freedom achieved by argument and by arms.

It is a feature in England's history that the people have never taken a step backwards. Often checked in their onward course, slow to secure obvious rights of person and property, obstructed for the time by power and ambition, they have through every trial vindicated their grand purpose of establishing a free system of laws and of making them supreme at all times and in every exigency. This is the distinguishing feature of all free government.

It must be admitted that the political institutions of America have secured to her citizens a perfect system of civil and religious liberty, and that she has achieved a material prosperity unparallelled in the history of nations. The Americans asserted, and with truth asserted, that their Government was cheaply administered, and that being free from a national debt of any considerable proportions, their taxation was comparatively light, and the national and state burdens upon the people small in comparison with European Governments. But this cannot now be maintained.

With the immense debt created for the suppression of the Rebellion, by the system of protective tariffs, and by the enormous corruption and frauds which taint the administration of the National, State, and Municipal Governments, I believe that the citizen of the United States is now subject to more taxation and pecuniary burdens than the inhabitant of any other nation.

In 1870, the revenue of the United States from the national taxation, amounted to £78,000,966 sterling; while, in the same year, the English revenue from the same source was £78,000,960, a striking financial coincidence.

The local taxation of England is estimated at about £25,000,000; the local taxation of the different States cannot be estimated with the same accuracy, but cannot be less than the same amount.

The Federal Government tax the income derived from real property; the State tax the real property which produces the income.

But the system of profligacy and corruption which now exists in America, and which becomes a charge upon, and an exaction from the people, cannot be estimated. I prefer to cite the opinions of statesmen and journalists upon a gangrene, which is corrupting the Great Republic to its very heart, than to rely upon my own personal observation.

There is no country in the world where such huge and irresponsible monopolies are tolerated. They control the State legislatures by a profligate distribution of money, and obtain grants of lands from the National legislature by the same, or other equally questionable inducements.

I quote from a leading New York journal:—"How the enormous land grants to Corporations are obtained from Congress is well known. A dozen capitalists combine; they establish their agents in the lobbies of the Capitol; they buy up members of Congress with promises of stock, or land, or money outright. The job is rushed through both Houses; inducements are brought to bear on the Executive, or its friends, and the Bill is signed. The conspirators become millionaires, and the people are plundered of millions."

To render this system intelligible it should be known that the United States possess a public domain of billions of acres, larger in its area than the whole of Europe, which should be reserved for future States, for emigrants, and other national purposes. The land is by corrupt means obtained by these Companies, not to use it them- selves in the construction of their works, but to make a profit out of it by sale.

One grant of fifty-eight millions of acres was made recently to a Company, not for building a railroad for the Government or the people, but which railroad they own absolutely, as they do the land itself, and for which the people must pay as much as though they had given nothing for its construction. The directors have

estimated their grant to be worth ten dollars per acre, on the completion of the road; or, in the aggregate, five hundred and eighty millions of dollars—a sum more than a fourth of the National Debt.

In the Senate, in March last, Mr. Trumbull—one of the ablest statesmen in America—charged the Federal Government with the prostitution of its influence for money; that this money was notoriously paid for the "packing" of political conventions, and the carrying of elections by "ballot stuffing." He distinctly charged that the patronage of the country was used for partisan purposes; and he warned the Legislature that, unless purity in the administration could be secured, the Republic would go down in a despotism worse than that of Constantinople.

In the *New York Herald*, of February last, allusion is thus made to the prevailing political corruption:—

"At no time, perhaps, in the history of the American people has the plague of low politicians been more mischievous than at the present period. Every community, from Maine to California, suffers from it in a greater or lesser degree, but none of them to a greater extent than the City of New York.

"In our own country we have not been without other and more grievous sufferings. We have been tried by civil war, pestilence, and fire; but from these, as from all other scourges that afflict humanity, recovery is possible and recuperation easy. But this plague of politics poisons the whole body politic, and if no remedy can be found and applied, it will as certainly bring decay and death to our entire fabric of government as the most virulent poison will to the human system. This is no imaginary danger; it is a real one. Already we find every department of government polluted and rotten. We find our grand and beautiful city a byword and a reproach among men, a prey to all the thieves and rascals who, under the deadly banner of party politics, invade our public places, plunder our treasury, fill our seats of justice with their partisans, turn over our schools to the control of the low, the ignorant, and the vicious, and, in a word, destroy everything that is most dear and necessary to civilized society. And as in the city, so in the State, where the legislative body has fallen so low in public opinion, has become so tainted with vileness and corruption that no decent citizen ever thinks or need think of entering it. Ascending from State to nation we find the same evil existing; and if not to so marked an extent it is only because the poison is slower in its operation upon the larger and stronger than upon the smaller and weaker organism. But even Congress itself is becoming deeply tainted with the national vice."

In the same month, a newspaper supporting the President and his administration, writes:—

"The fact of very general corruption in our politics has been long alleged. That elections are carried by fraud, that the whole civil service is a vast system of virtual bribery, that politics has become a profitable trade, and that places in the Legislature and elsewhere are sought for the money to be made out of them, are assertions by men of both parties with which we have all been long familiar.

"The corruption now exposed in the city of New York is not, of course, confined to that city. It is known elsewhere, even if not upon so large a scale, nor so distinctly revealed. Its object is the security of party ascendency. Now it is a very grave question for the consideration of every American, citizen who can lift himself above the mere partisan view, how long our system is safe and our peace assured, when, every four years, this corruption is invited to struggle for the possession of a hundred thousand offices, and the raising and spending of three or four hundred millions of dollars."

Politics in America have become a trade, and not an aspiration. The highest earthly desire of the ripened mind—the desire of taking an active share in the great work of Government—is not, as a general rule, the motive which prompts the aspirant for office and positions of honour. Elections are costly; the tenure of the seat is short; men of inferior position are elected; and the temptation to make money by unfair means is irresistible.

Let me take, as an instance, the election for President, to take place in November next.

The amount expended in a Presidential contest, it is not an exaggeration to say, will be upon each side twenty-five millions of dollars at the least. Hired orators, public meetings on a large and expensive scale, committee rooms engaged for many months before the event, printing, and all the adjuncts of a great and exciting conflict over an enormous area, necessitate lavish expenditure. This sum is paid, not from the private resources of the candidate, but from a contribution levied upon all who hold office under the Government, in the custom houses, treasury department, and other public establishments of the nation.

What other result can be anticipated, than that the holders of offices thus taxed for political and partisan purposes, in many instances far beyond their means, should during the brief occupation of such offices enrich themselves from every opportunity that occurs, and reimburse their involuntary expenditure by frauds and exactions upon the people?

It is a growing scandal, seen, known, and deplored, by honest and upright statesmen and politicians in America; and they do not hesitate in public and in private to say, that public opinion is powerless to correct or arrest the evil.

Some of the State legislatures are notoriously venal; many of the municipal governments proverbially corruptible; and there the administration of justice is poisoned at its very source. In many of the tribunals confidence in the purity of justice is utterly lost; and judges are denounced in the journals of the day as holding

their hands for pecuniary bribes, and rendering decisions, influenced by motives as degrading and corrupt.

It was with great difficulty that I could convince a United States Senator, who was sitting with me a few evenings since under the gallery of the House of Commons, that the process of "lobbying" was not carried on amongst the members of that House.

"Look," said he, "at the people who catch hold of a member they have called out, take him into a corner, and surround him and talk to him. We know what that means at Washington." "The lobbyists, whose profession it is to secure the interest and votes of Congress-men, know the price of every man, and whether they can approach him directly, or through the more circuitous route of indirect influence." I described, as circumstantially and as graphically as I could, that the congeries of gentlemen who had enclosed a metropolitan member, and adhered to him like flies round an empty barrel of molasses, were a deputation of licensed victuallers, who had an interest in a bill affecting their trade to be discussed that evening in the House; that, as their representative, he was hearing their wishes, and preparing himself to advocate them in the forthcoming debate; but I doubt whether at this moment the Senator is very clear in his mind that all this importunity and suasion was entirely free from more direct and questionable influence. "It may be so," said he.; "but if it is, it aint like Congress, that's all."

In as brief a space as it were possible, I have endeavoured to explain the great political scheme, with its chief component parts, which the fathers of the great American Republic took such patient and conscientious pains to found and consolidate. I have shewn that of all the philosophical students of history, those illustrious men were the least likely to be carried away by a literary enthusiasm which would see no imperfections in the Greek and Roman Commonwealths, renowned as these latter were in arms and arts, in poetry, in oratory, in philosophy; notwithstanding that they were the fountains of thought from which succeeding ages derived their chief notions of patriotism and honour. The greatest of American statesmen did not shut their eyes to the fact that, whether in carrying out their projects of territorial ambition, or advancing their commercial enterprises, the Greek and Roman republics were as reckless of the *jus gentium* and the rights of foreign powers, as cruel devastators of humanity, as prone to war, and on too many occasions, as guilty of domestic oppression, as the most despotic monarchies that ever preceded or came after them.

The venality and selfishness of those ancient republics were not lost sight of by the writers in the *Federalist;* and, indeed, under what form soever of government men live, they should never be forgotten.

The victories of Marathon and Salamis, with all their rich memories of patriotism and renown, had no power to arrest the corruption and degeneracy which rendered the various Grecian communities, too long weakened by mutual jealousies and internecine strife, an easy prey to the astute Macedonian conqueror, who said that he could take the strongest city of them all, by sending into it an ass laden with a couple of panniers of gold.

The corruption and degeneracy of the descendants of the great Romans, who fought Hannibal for upwards of fifteen years, and conquered him at last, became so notorious about a century afterwards, and so well tested by another great African chief, Jugurtha, that he designated Rome on leaving it "a venal city, ripe for destruction, whenever it could find a purchaser." "About this time," writes Sallust, in his account of the Jugurthine War, one of the most beautiful historical works that has been preserved to us from antiquity, "the Roman Republic was atrociously agitated by the contentions of the tribunician factions." The heads of these factions were the pre-eminent guardians of the popular liberties; they were the gentlemen called the "*Tribunes of the People!*"

I have pointed out how the wise founders of the American Democracy selected the little Lycian Republic, as a better model than either of its more powerful and vaunted predecessors whereon to form their new commonwealth. I have told you how that admirably conceived, and originally well ordered political community, by falling into the same habits of selfishness, jealousy', and corruption, was blotted out from the list of independent nations, and absorbed by imperial despotism.

And in detailing to you the history of the rise, progress, and institutions of the greatest of ancient or modern republics, the mighty Republic of the West, I have not omitted, for the cause of truth and liberty, to point out also its imperfections. I have not shrunk from exposing the wide-spread corruption which has begun to sap and undermine the foundations of the magnificent structure—a corruption which has progressed more rapidly than in the cases of Greece and Rome, that is to say, within the first century of the existence of the American Republic—and which, if allowed to go on for another generation, will and must be the cause of its destruction. In doing this, I have incidentally glanced at our own English political institutions, which, instead of being in their leading and more important features, detrimental, I consider more conducive to democratic rights and liberties than their congeners or those political institutions of America which were professedly modelled upon them.

May the recuperative power which most unquestionably exists in the American Republic, the roused indignation, the proud sense of injured right and honour which is beginning to show itself amongst the higher

and more cultivated classes of its citizens, come before long to the rescue And may we not hopefully expect, when that class of minds begins to think seriously, and that class of men to speak out unmistakably on this subject of national disgrace and dishonour, that the day of regeneration is not far distant?

I have not made the political institutions of England the subject of unmitigated praise, nor, whilst contrasting them in some of their leading features with those of America, described them as perfect. On the contrary, many of them are capable of improvement, some of them of very great improvement. But the reform of their imperfections will come in due time, like many which have been the disgrace of our political system before them, and which have been, with the increasing intelligence of the English mind, the aid of the independent English press, and the calm determination of the English people, gradually swept away. The spirit of reform is still abroad, and will do its good work in its own good time.

Of our English Constitution, this time-tested and time-honoured Constitutional Monarchy, we may well be proud. We have every reason to stand by and maintain it against all who would seek to lower its character and destroy it in favour of a republican system with an elective president and a concomitant magistracy, forgetting that our own political system after all is a republic with an hereditary presidency, and a magistracy holding its offices and performing its functions during good behaviour, fearless of popular intimidation, regardless of party intrigue, and independent of the Crown.

I would address myself more particularly in the remarks which I have made to the section of our advanced liberal party in England which, however well-meaning its leaders may be, has recently raised a half-unfurled un-English looking banner, and commenced, what I cannot help calling a weak and unreasoning opposition to our English Constitutional Monarchy. They will be warned, I trust, by the widespread political demoralisation which has set in amongst the descendants of the wise and high-minded men who founded the great Transatlantic Republic. They will be warned also by the sad and frightful state of things which took place but recently in a neighbouring country, and amongst one of the most enlightened, accomplished, and, even amidst its most terrible misfortunes, one of the most powerful people in the world. These are your real enemies of democratic liberty whose hydra-headed intolerance and unmitigated selfishness lead to the anarchy which ends in military despotism; and equally guilty are they, whether they pollute the fountain sources of liberty with the impurities of a hideous political corruption, or stain those sacred waters with human blood.

Abuses and extravagance, the prurient excrescences of Monarchy, have doubtless clustered around the English Throne. I have seen the giant oak on the banks of the Missouri, its vast limbs paralyzed, its growth encumbered, and its vitality destroyed by the climbing parasites which the too fertile earth has encouraged to surround it; but this is no argument for destroying the majestic grandeur of the tree. Tear away with unsparing hand the growth that defaces and obscures it, and it will flourish with renewed vigour for centuries. The man is a demagogue and not a statesman who seeks to delude the people into the belief that the institutions of America, if transplanted, would flourish upon English soil; he deceives them if he tells them that they would enjoy a greater degree of political liberty and a cheaper system of government under such institutions than under his own; he is ignorant of the political power confided to the people, if he tells them that they have not the means in their own hands to correct the abuses, the extravagance, and the cost of which he complains.

Some public writers draw conclusions concerning matters of government from the operation of certain systems of administration which have been found to work admirably in specified countries, without taking any account of the traditional habits of the people, their intelligence, or the character of their religious opinions. It took many centuries, involving vast sacrifices of person and property, to perfect the present Constitution of England, while that of the United States was comparatively the work of a few days. The foundations of the English Government were laid in absolutism, upon which has been raised a superstructure of freedom.

The most humble and illiterate man, although he may not be able to recount the battles that have been fought and the blood that has been shed in asserting and achieving the civil liberty he now enjoys; though he may not have a defined notion of the vindication that liberty received at Runnymede, at Lewes, and at Naseby; though he may never have heard the names of Simon de Montfort, of Hampden, or of Sydney, yet knows and feels that the blessings of freedom, which are his own, have been the work of centuries of struggle on the part of those who have bequeathed the priceless legacy to him and to his children.

An American of culture and sagacity will tell you that he has more reason to fear the tyranny of the majority under his form of government, than we have to dread any encroachment upon our liberties from the undue exercise of the prerogative of the Crown; and if any change in their form of government were desired, I believe that there are more well informed and thoughtful American statesmen who would advocate the adoption of a Constitutional Monarchy, than there are men, of the same class and character, in England, who would vote for a republican form of government in lieu of those institutions which we have inherited and under which we live.

The Queen of England bears a charmed name. Her domestic virtues, her mild constitutional rule, her world-wide philanthropy have secured for her, not merely the cold respect, but the deep admiration of millions

of citizens of the United States. At the rude gatherings in the Far West, amongst the settlers and emigrants of all nations, I have never heard that name received but with demonstrations of regard; and in the more numerous assemblages of the great cities, where demonstrations of agitation and political bitterness against the Government of England were loud and violent, I have proposed her name amid the angry elements, and a deepfelt and cordial response was ever the result.

The example of our Constitutional Monarchy has certainly been studied and its model adopted by all the European communities which have thrown off the yoke of their old despotisms. The leading statesmen of France have their eyes on it with an admiration and love akin to adoption. Already they more than half acknowledge to have learned their useful lesson where the best lessons are learned—amongst "the uses of adversity." And it will ever be studied by the still oppressed of the nations, and adopted by them when the day of their emancipation shall come. The hope of civilisation, it looks eastward, spreading its benign influence of knowledge and authority, whilst, to the great Republic of the West, it stretches out more warmly than ever the hand of reconciled friendship. May the two mighty Anglo-Saxon republics, the one hereditary, the other elective, stand firmly and lastingly together, for the advance of the great cause of human progress, and in defence of the liberties of mankind. Of the same origin, the same language, literature, and laws, may they ever have cause to feel that they are one and the same people, may this be their hope, their pride, their destiny—

"Paribus se legibus ambæ

"Invictæ, gentes æterna in fœdera mittant!"

Which is the Best Friendly Society? A Lecture on Ancient and Modern Rechabitism.
By Dr. F.R. Lees
Author of "The Prize Argument on Prohibition," "History of Alcohol," "Lectures for the Million," etc., and Joint Author of "the Temperance Bible Commentary."
Land of the bold Close fighting Mysian race, where abide On milk sustain'd, and blest with length of days, The Hippomolgi, justest of mankind. *Homer's Iliad*: b. xiii.
Guardian Letterpress and Lithographic Works. Manchester 1875

The Best Friendly Society.

I.

FORETHOUGHT is the characteristic of civilised man, as distinguished from the brute and the barbarian in general; and is, in fact, the foundation of all true civilisation. Yet some degree of forethought is found among savages, and much special thrift among certain of the lower animals, such as the squirrel and the beaver, the ant and the bee. These care for the morrow, by a natural and inherited instinct; and provide food in summer for the wants of the bitter winter that is to come. But man, to be civilised and powerful, must have incessant and far-reaching forethought, and make provision against a thousand accidents or liabilities, alike in health and sickness, in peace or war, on land or sea. In truth, the main business of life is that of an Insurance Society or of a Benefit Institution; from the marriage of a man and woman, to the foundation of a State. Life is an endeavour to ensure the development of our nature against the operation of all forces that would hinder or destroy it, and by employing *such forces* as *we can command* to resist those which tend to our injury. The beginning of this line of life is *self-denial*—the primary virtue of man. We must sacrifice the pleasure of the moment present, for the benefit of the years to come. We must toil more to-day than the needs of the day require, in order that the surplus produce may meet an emergency, or a new want, to-morrow. The husband must lay up 'store' for the needs of the wife and child—the strong man of to-day must work while the sun shines in order to produce, that which he will need when weakness and age comes upon him, as come they will. As the Proverbs say, "Make hay while the sun shines," and so "Provide for a rainy day." He who idles in his prime, must starve, or beg, or steal, in his later years. He who spends his own 'thrift' or produce now, will spend his neighbour's in his old age. Hence, while the thrifty man is a benefactor of society, the spendthrift will become a beggar and a bane.

So much for the *principle* of forethought, or of thoughtlessness, as regards extremes. There are, however, degrees of accidents and conditions, for which the *individual* cannot fully provide, let him be never so prudent. Fortune is fickle; the laws and forces in nature and art are so complicated that their working cannot always be foreseen; and human nature is so weak, physically and mentally, that we shall suffer unexpectedly from its perturbations. This leads men, in civilised life, to combine for mutual protection, against fire, storm, collision, death, sickness, and loss of property in any way. *Friendly* or *Benefit* societies are only insurance societies for working men, with small payments equal to their means.

Our Saxon forefathers had societies of this kind, and the Middle Ages were full of 'Guilds' answering the same end. But it is only in modern times, when careful registrations of births and deaths became common, and when statistics of Sickness were gathered into form, that these societies could be constructed on *scientific* principles. It is now well understood that sickness and death depend on *conditions*, or causes. People are not always alike sick, or die at one age. They die or are sick, therefore, according to a *law of circumstance*. The results of this law can be ascertained for each epoch, or country, or class; and *so* referred to the causal conditions—the 'circumstances' of that epoch, country, or class. For example, a country that is ill drained, subject to cold and damp winds, will have a greater sickness and higher death rate than one that is sandy, well drained, and of a genial climate. A town population, as a rule, will have more sickness and shorter lives, than an agricultural district, other things being the same. The class of ministers and gentry, living easy and regular lives, under good sanitary arrangements, will have less sickness by one-half than hard working, hard drinking labourers, who live in small, ill-ventilated, and often undrained hovels. But even their death rate again is not so high by *nearly one-half* as that of Publicans, who are killed by their own dreadful business: so that charity to them, as well as patriotism, demands the abolition of their fatal traffic.

When the Science of this question is understood, those who are virtuous, temperate, and industrious, will be able To Select the Circle for Insurance within which health is highest, and disease lowest. At present, in various forms and ways, they are not only absurdly, but mischievously, paying to meet the risks, and mitigate the sufferings, of the idle, the foolish, and the vicious. They interpose a power between violation of law and penalty, and thus offer a premium to vice, just as truly as the State does in the bad and impolitic Insurance Society called "Poor Laws." Not one teetotaler in ten thousand ever finds *his* way to the Poor House—even by accident. But almost all other representatives of society get there. Thus honest men eventually keep the dishonest, industrious men the idle, the sober the intemperate, or, in one word, the *public* keep the beggared customers of the *publican!* "Benefit Societies" assembling at drink-shops really meet for the "good of the house," which means the ruin of the men, and often the bankruptcy of the club. Under any circumstances, however, many of the Friendly Societies of the country are virtual frauds upon the innocent and the ignorant. Young men are made to pay *as much* as old men, though it is plain (1) that they will have less sickness; (2) they will have to pay longer; and (3) they may be sober and healthy while the bulk of the old members may be lame and lushy. One sees this every day. Now to call such a society a *Mutual* Benefit Society is to deceive—and if it is to continue, let it be named a "*Charitable* Society," chiefly for the benefit of one class, the careless and the selfish.

But the importance of such societies, founded on correct principles, cannot be overrated, either as regards the Temperance Reformation, or the general interests of the community. However noble the bond of brotherhood may be, however pure the inspiration of Temperance-man or Good Templar; fidelity to the pledge and habit of abstinence will be greatly confirmed by having a *pecuniary pledge* in addition. Sympathy, Duty, and Interest will form a chain not easily broken; and it is a curious fact in human nature, that *interest* will successfully resist sudden temptation where higher principles fail. And the general advantages of such societies are apparent. The labouring man, with a family, finds it hard, even with the utmost frugality, to provide for "the rainy day"; but here the Friendly Society comes to his aid, and out of his small contributions has accumulated a fund to meet the exigency, without privation or suffering to his wife and children. He receives no degrading charity, for he is his own Almoner, and can retain his independence and self-respect. A person acting on such principles, just as one practising abstinence, must *necessarily* be more amiable and considerate than one who overlooks them; must be, by virtue of his self-reliance and self-denial, a better servant, a better father, and a better citizen. Knowing his own rights, he performs his corresponding duties, and, instead of contributing to that mass of pauperism which at once burdens the industry and blights the character of our people, he lessens the rates of the parish while he increases the wealth of the nation.

Forty-four years ago a *new* social condition was introduced into the lives of a Class of the People which has thrown quite a novel light upon the facts of health, sickness, and mortality. Then, almost all the men drank intoxicating liquors, and fathers gave them to their wives and children. They were supposed to be a daily need, like our "daily broad."

Even still, it seems, we need not refer to fossil specimens of the class, for Six W. Cunninghame. M.P., said at Ayr the other day, that "there are many who think that

Grog cures the gont, the cholic, and the phthisic,

And is to all men the very best of physic."

"I believe," adds he, "that spirituous refreshment is beneficial, and has been placed in our hands by Providence for use "!!!

It was not known, save to a select and thoughtful few, that *alcohol is a poison to the blood and body of man*, and produces weakness, disturbance, and disease, as surely by circulating in the domain of life, as foetid gases and microscopic fungi produce infection in our cities. Even now our prating and priggish Sanitary

Reformers cannot see that *the* drainage and water supply which is most important to us, is that *within* us rather than that *without* us! But stern facts have revealed the truth, that The One Circumstance of Drinking, or not Drinking, as much Affects Health and Life as all other Sanitary Circumstances put Together. We have in our country 3,000,000 of teetotalers, and though they are mainly of the humbler orders of society, with the least sanitary advantages of ease, fresh air, and large houses, They have Less than Half the Average Sickness and Mortality of the Best of the Community.

II.

As the members of temperance societies became numerous, thirty or thirty-five years ago, they naturally looked with dissatisfaction at the way in which the ordinary Benefit and Friendly Societies were conducted. Not only were unsteady men freely admitted, but by meeting mostly at Public-Houses temptations were held out which *made* men unsteady. Drink must be had for "the good of the house," which meant the injury of the members, and this often led (as it still leads) to a system of drinking fatal to the true ends of the institution. The result was, that the Teetotalers here and there began to found Benefit Clubs amongst themselves, and the results became more remarkable, year by year. Finally, two large societies were formed—THE INDEPENDENT ORDER OF RECHABITES AND THE TEMPERANCE PROVIDENT INSTITUTION.

John Tidd Pratt, Esq., the late Registrar-General of Friendly Societies, said, some years ago, "The number of members of such societies is 2,500,000. A great foe to economy is, that the meetings are held at public-houses. In most of the old societies the members spend on an average, five or six shillings per annum. If these meet fortnightly and 300,000 are abstainers, and the rest spend 2d. each club night, the total amount in twelve months would be half a million of pounds!" What a grand capital for self-help is thus wasted. In his report for 1860, Mr. Tidd Pratt says, "In the course of last year I found that in Herefordshire, since 1793 the number of societies enrolled and certified was 136. Of this number 123 were held at public-houses, and 13 in schools or private rooms. Of those held at public-houses no less than 43 had broken up, but of those held in schools or private rooms only *one* had been dissolved."

Let me state a physiological *fact* here, which will explain the figures that are to follow. Every ounce of alcohol (and a pint of beer contains two) produces 4,300 *extra heart beats* in a day. It is exactly like spur and whip—it takes steam *out* of a man; it cannot (like food) put strength *into* him. Hence the 'weariness' that follows drinking. It is a voluntary going to the tread-wheel—for the love of it!

Before I state the facts elicited by thirty years' experience in these great societies founded upon temperance principles, it will be well to give a number of illustrations which crop out from various local and even *compound* experiences, for contrasts are themselves instructive.

One preliminary remark is needed—namely, that the *natural law* of health is, that when the Constitution of Man is in its greatest vigour, the least deviation from health is found. Health, in fact, means strength, and weakness disease and death. Thus youth is the healthiest period, middle age next, and old age least healthy, though an absurd idea to the contrary once prevailed, founded doubtless upon a partial induction of exceptional cases of weak young men outgrowing their ailments! The figures of Mr. Neison, the actuary, show that the average amount of sickness between the ages 20 and 60, a period of 40 years, is 60 weeks 3½ days, while between the ages 60 and 70, a period of only 10 years, it is 77 weeks and 2 days; or, in other words, there is nearly 5 times greater liability to sickness. Hence the supreme folly of young men paying the same amount as old men.

One of the earliest and most striking examples is taken from a Government Sanitary Report in 1841, concerning *eight* Sick Clubs in Preston.

- 1000 Non-abstainers have 23.3 sick per annum.
- 1000 Teetotalers have only 13.9 sick per annum.

7 weeks 4 days is the average period of sickness with the Drinker.

3 weeks 2 days is that amongst the Teetotalers.

£2. 16s. 1d. is the average sum paid to, or for, each Non-abstainer.

£1. 9s. 2d. that to the Teetotaler.

I have here a paper which shows the same remarkable exemption from sickness and death in a country club—namely, the Northwich Abstinence Benefit Sick Society's Report for 1860. "During 24 years the average number of Members has been 80, the deceased members only 9—which number is surprisingly small, and cannot fail to impress the unprejudiced mind in favour of entire abstinence."

Nor is this unparalleled: for I find that the Teetotal Security Tent of Preston, with an average of 45 members, were 14 years without a death; and they had no death last year, with 129 members.

In the following year, my friend, Mr. James Hawkins, of Colet Place, London East, informed me that he had attended three Benefit Clubs of Abstainers for three years, and had only had *one* death, and that of a

consumptive patient admitted without medical certificate. Now it must be always borne in mind, that all Temperance Clubs necessarily include a number of persons who have been reformed from intemperate habits, which will be more than a set-off against the cases of excess that may, by carelessness of medical men, or by growth of appetite, affect the class of moderate drinkers in the statistics of a high class Assurance Society, which will be pretty careful in the examination of candidates for admission.

Dr. Henry Munroe, F.L.S., of Hull, has had two Friendly Societies under his care for years, of which he gives this account:—

DRINKERS, including several Abstainers. Average sickness of each sick member per year, 11 days, 21 hours. Deaths, 3 in 200.

ABSTAINERS (of whom several had been drunkards): Average sickness, If days. Deaths—at the rate of 1 in 500.

But I will take the case of a Forester's Lodge, formed at Streatham, near London, to evince the extraordinary difference in the health of the two contrasted classes.

Had these last been as sick as the former, their proportion of the sum would have been £17. 15s. 8d., in which case the whole of the membership would have had to pay £16. 10s. 8d. *extra*.

The proportion of these last would have been £16. 14s. 6d., and £16. 0s. 6d. extra would have had to be paid by the membership.

The proportion of these last would have been £20. 8s. 0d., which thus is saved *by* all and *for* all; but the effect seems to have been potent in producing conviction : since nearly half the Lodge had become abstainers, and thus reduced the sickness and consequent cost.

After such experiences, one can no longer wonder at a testimony like the following, given at St. George's Hall, Bradford, in March, 1873, by Dr. Robert Martin:—"I was surgeon to a Lodge held at a public-house, and gave it up after two years' trial, because they had so much sickness that they were never off the door-step. I was surgeon also to a Rechabite Tent at the same time, and I made up my mind to give them up also—but for a totally different reason—the Rechabites *never came* for *medicine at all,* so I said to them, Gentlemen, I can no longer, for shame, take your money, for you never require my services."

Some years after its formation, the Temperance Provident became the Temperance *and General* Provident Institution, by accepting carefully selected lives of Moderate Drinkers (Department IX.), but of course keeping the Books and Accounts distinct. This was an admirable thought, and two or three quinquennial divisions of profits afterwards began to show the differences of value in the respective lives. The following appeared in the Report of 1861:—

"In Department I., which belongs to the Temperance Section, the *Reversionary Bonus* will range, according to the age of the Assured, from 35 to 86 per cent, on the amount of Premiums paid since 1855, showing an average of above 60 per cent.

"In Department IX., which belongs to the General Section, the *Reversionary Bonus* will range from 24 to 59 per cent., showing an average of above 41 per cent.

"In Department XI., comprising Policies on Joint Lives, the *Reversionary Bonus* will range from 25 to 48 per cent., showing an average of above 36 per cent.

"The difference in favour of Department I., as compared with Department IX., is equal to £19 upon £60. 10s.; in other words, if the Reversionary Bonus upon a Policy in Department IX., should be £41. 10s., in Department I., upon a Policy which has paid the same Premiums, and has the same time to run, it will be £60. 10s."

The latest divisions fully bear out this promise, as the following tables will demonstrate :—

Mortality Returns of the Temperance and General Provident Institution, for eight years, from January 1, 1866, *to December* 31, 1873.

Thus, while in Department I., the claims were nearly 28 per cent below the expectation founded upon the Life tables, Department IX. was less than 3 per cent below.

The superior value of the Temperance Lives is no less distinctly shown in the difference of monetary result. Being a Mutual Society, a certain proportion of the profits are divided every five years. At the last division of profits where an assurer in the General Department for £1,000 would receive £72, an Insurer in the Temperance Department for the same sum would receive £114. A neighbour of mine was insured for £2,000, and at his death £250 was paid in addition to his widow, as his share of the *profit:* being £100 *more* than a Moderate Drinker would have got, insuring for the same sum.

I now come to the Independent Order of Rechabites, the oldest and most influential of the Temperance Benefit Societies. It is also the richest, for it was given in evidence (October, 1871), before the Commissioners on Friendly Societies, that while the funds of other Friendly Societies, with the same ratio of subscriptions, averaged only from £2 to £4 per member, the Rechabite Order averaged £6. 18s.

It is somewhat unfortunate that sufficient care has not been devoted by the Council of the Order to the

collation of its statistics; but still very important facts *have* turned up. Here is a statement recently made by one of the late Chief Rulers, my friend, Mr. Joshua Pollard, of Bradford:—

During the year 1872, the Bradford District of Rechabites had only amongst their 700 members an average sickness of 3 days and 4 hours per member, at a cost of only 4s. 7¼d. per member, being *two-thirds* less both in time and money paid for sickness, than the best mixed Friendly Society. The death rate is equally remarkable, for during the year 1872, out of 703 persons insured in the Funeral Fund there were *only three deaths*, which is one death in 234 persons, an average of little over four deaths per 1,000. At Denholme, near Bradford, there is a Tent of Rechabites of over 30 members, which has been established five years, and up to this time they have had no sickness, nor a single death. Where is the mixed society of moderate drinkers, drunkards, and teetotalers, which can show such a death rate?

Let us now compare the Bradford District of Rechabites (3,000 members) with the Oddfellows of the same district (16,741 members), for the years 1868 to 1872.

First, as regards Sickness.

- Oddfellows had an average sickness of 13 days, 3 hours.
- Rechabites had an average sickness of 3 days, 12 hours
- Cost per head to the former, 12s. 9d. To the latter, 5s. 3d.

Second, as regards Death.

- Oddfellows proportion to Members is 1 in 51
- Rechabites proportion to Members is 1 in 155

Only one deduction can be made from these startling contrasts : viz., that the average age of the Rechabites is over 30 years, while that of the Oddfellows is 40 years per member, showing that there is a rush of the younger generation into the newer and safer order. Still this difference will not materially affect the result, which, calls for immediate reflection and corresponding action from the best and most thoughtful of the Working Classes of our beloved England.

III.

Passing from the Brotherhood of Modern Rechabites, I point to an ancient and not yet extinct fraternity of whom they are the nominal descendants, though let me hope in some sort the 'spiritual'—for a nobler people, and more genuine example and inspiration, they could hardly select out of the compass of history. They were brave, faithful, persistent, self-denying, open-minded, tolerant, truth-seeking—whose very virtues cast reproach upon the cant, the compromise, the self-indulgence, and the corruption of modern society.

They have a genealogy which casts ridicule upon the bastard aristocracy of William the Conqueror, and the titled descendants of Charles' Courtezans. Moses and David knew them as Kenites, and Diodorus Siculus describes them under the name of Nabathæans.

About 150 years ago, Mr. Lewes, in his *Origines Hebræa*, thus graphically paints the Order :—

"The RECHABITES were a sort of votaries among the Hebrews, descended from Jethro, the father-in-law of Moses, and his son Hobab, from whom came Rechab, who was called The Just. It is uncertain when they first formed themselves into a Society; but they always had orders and regulations peculiar to themselves. They were remarkable for their strict piety and integrity of life, and were originally called Kenites. They likewise had the name of Scribes, because they studied the law, and were very ready in the expounding of it. Jonadab seems to have refined their old discipline; and they always appealed to his injunctions as the founder of the fraternity. . . . They were bound to drink no wine, nor to build houses, but to dwell in tents [a sanitary and politic law, not at all unpleasant in the soft climate of Palestine]; nor to sow seed, nor to plant vineyards, nor to have any; but to give themselves up to a contemplative life, and avoid all occasions of luxury and avarice. This Religious Society was highly approved of by God."

With the history of the Rechabites in the Bible, and the extraordinary trial to which they were put by Jeremiah, as recorded in the 35th chapter of his Prophecy, I could never understand how people pretended that abstinence was discountenanced in Scripture. Old Chaucer, it is certain, read the story very differently, when he says :

"All the soveraine acts, dare I say,
Of Victories in the old Testament,

Thro veray God that is omnipotent.
Were done in abstinence and in prayere;
Look in the Bible, you may learn it there."

As we have seen, from the best average health results the longest life, and from this the permanency of families and nations. When titles or tribes become extinct, some organic law has certainly been broken. As Confucius has said, "Heaven shortens not the life of man; it is man himself who does it by his own vices." Ancient, as well as modern times, have presented ample proof of this,—proofs known to the Prophets as to the sons of Jonadab. The Bible, indeed, in this episode, contains one of the most noteworthy illustrations of the connection beween *temperance and prolonged national existence*, which is to be found in universal history. The Rechabites were an Arabian and nomadic tribe, earnest seekers after truth, proselytes to the Jewish religion, having renounced the stupid idolatry of their country for the worship of the invisible and true God. They were a peaceable and quiet people; not without bravery, as evinced in their expulsion of a degrading and cruel idolatry from the land; possessed of great firmness of purpose and moral persistency, as evidenced by their respectful but unhesitating refusal to drink wine even when offered by a prophet, in brief, they were a very favourable specimen of Arabian character, and, as distinguished horsemen, for *Rechab* signifies 'a Eider,' may be regarded as the Chivalry of the Wilderness. About three hundred years before the time of Jeremiah, Jonadab had renewed and amended the laws of the tribe. Anxious for the preservation of the people,—and knowing that they only remained in Canaan by *permission*, as friends and allies of Israel,—he adopted every precaution to keep them peaceful and obedient, and to exclude the growth of avarice and luxury. He commanded them to continue that nomadic and simple mode of life which they had practised for ages,—to dwell as heretofore in tents, lest the acquiring of fixed property should generate an attachment that might bring them into conflict with the permanent proprietors of the soil or excite cupidity in others,—to abstain from that drink which is 'raging,' lest it should breed quarrels, and from vintage fruit lest it should foster luxury, or, in some of its forms, through ignorance and mistake, lead to the use of the fermented kinds of wine. They did this, that they might "*live long in the land*,"—on which passage Professor Noyes comments as follows:—

"These words seem to indicate the main purpose of the regulations of Jonadab, the son [i.e. descendant] of Rechab. . . Their observance, would, he supposed, keep them on good terms with the Jews, as they would have fewer possessions to excite envy, . . . and would possess more self-command, and more caution in avoiding quarrels."

The interview between Jeremiah and the Rechabites temporarily dwelling at Jerusalem, is very instructive. He takes them into the house of Jehovah, and sets before them, to *test* their fidelity, pots full of wine. He does not *tempt* them. Neither the plea of argument, nor the pressure of Divine 'authority' is applied. He regards their refusal to drink as a virtue. Jeremiah, it appears, dare no more have given wine *to them* than to the Nazarites, on his own responsibility. The kind of wine we may assume to have been *proper*, such as was provided for the temple-service: a wine that might be innocently drank by men in general, though not by the Rechabites. The Prophet received an express *command* before venturing even to *offer* wine to these abstainers;—but he is *not* authorised to say anything in favour of the wine, or against the practice of the sons of Jethro. There is no lie uttered—no intimation that *God* desires them to drink. It is merely the man *Jeremiah* that speaks :—

"I said to them—Drink ye wine. But they said, We will not drink wine."

The answer was deemed sufficient by the prophet, accompanied as it was by a reference to the noble purpose and venerable origin of their abstinence, the merits of which had then been tested by an experience of centuries. He does not urge them to violate or abandon their principles—which, *if they were wrong*, he might well have done—but clearly showed, in refraining from all solicitation, the deference which he felt to their conscientious scruples. Nay, it is no longer Jeremiah who speaks,—all that follows has a higher authority:—

"Then came the Word of Jehovah to Jeremiah, saying:—The words of Jonadab, the son of Rechab, in which he commanded his sons not to drink wine, have been performed; for they have drunk no wine to this day," etc.

To understand the 'blessing' pronounced on the Rechabites we must look at their own reasons for abstinence:—

"Jonadab, the son of Rechab, our Father, commanded us saying, Ye shall drink no wine,
The tent-law they occasionally departed from, for they were then in Jerusalem; but the reason of this law was universal.
ye nor your sons, for ever, ...That Ye may Live Long in the Land Wherein Ye are Strangers."

They would dwell for ever, even as *strangers*, in the land, if they might but know God who revealed himself there. Hence, that they might be neither expelled nor destroyed as a people, *through intemperance*—that they might avoid the sin and pride of Ephraim,—that they might live long *in the land*

where Israel dwelt,—they would drink no wine. They had a right to expect, both on grounds of reason and experience, the continued existence of their tribe. The *word* confirms this; it promises that the very object of their hopes *shall* be realised, in substance, if not in form. God himself is pledged to fulfil their expectations, *enlarging* indeed the very blessing which they sought.

"THUS SAITH JEHOVAH OF HOSTS. . . . there shall not fail in the line of Jonadab, the son of Rechab, Men to Stand Before me for ever."

He who made the preserving law of temperance, and *foresaw* the consequences of its rigid observance to the end of time,—also fore-saw, what the sons of Rechab did not, that Israel should himself be expelled from the land of his fathers, which could then be no habitation for his allies. Hence, the promise is *not* limited, as were their expectations, *to the land* of Israel, but extended in its substance to The Entire Duration of Humanity. There, or elsewhere, if faithful to the preserving law, *the posterity of the Rechabites should maintain their existence as a people*.

Now comes the question, Have these people been faithful to their pledge, and God to his promise? The answer must be in the affirmative. Rabbi Benjamin, of Tudela, in the twelfth century, mentions their existence; and Dr. Joseph Wolff, in his first Journal of Travel, records having met with some of them thirty-five years ago. He found them to resemble their ancestors; willing to receive truth, and though Jews, to read and circulate the New Testament; simple in their manners, kind, courteous, brave, intelligent, and as horsemen, the most accomplished cavaliers of the orient. One of them whom he saw, and who referred to Rechab as his ancestor, read fluently both in Arabic and Hebrew, and invited Dr. Wolff to visit his tribe in the vicinity of Mecca, calculating their number at about 60,000. The Missionary was struck with the fine appearance of the man, and notices that he had a loud voice, and was distinguished by "*a more lively countenance than the Arabs*." These tribes dwell in tents, which they have pitched in three oases of the desert, and they neither sow seed nor plant vineyards.

In the Ethnology Section of the British Association, at Cambridge, 1862, the proceedings commenced with the reading of a paper by Signor Pierotti, "On recent Notices of the Rechabites," the sum of which was, that towards the end of April, 1860, the Signor, travelling south of the Dead Sea, and in a valley about two miles therefrom, met a tribe of Rechabites, whose object it was to procure a supply of linen and salt. The next day another tribe arrived on a similar errand. They were exceedingly clean in their dresses and persons (cleaner than other Bedouins), hut the most singular point connected with them was, that they had a copy of the Scriptures in Hebrew. The chief location of the tribe is south-east of the Mountains of Moab. Their general sojourn is on the west shore of the Dead Sea, and some of their members had been heard to say prayers, at the tomb of a Jewish Rabbi, in the Hebrew language.

Thus amidst the clash of conquest and the crush of kingdoms,—while the mighty Empires of Persia and of Greece, of Rome and of Parthia, have risen in glory and declined in shame,—and while the desolating armies of the Saracen and the Crusader, of the Mongol and the Turk, have rolled over the battle field of the east,—amidst the long and sad eclipse of Israel, and the triumph of the Crescent over the banner of the Cross,—in short, amid the ruin and revolution of twenty-four centuries,—the noble and united Band of Rechabites have preserved their simplicity, their sobriety, and their freedom,—remaining amidst the wrecks of time, an impressive monument of Prophetic truth, and a living witness to the imperishable nature of the Divine laws.

For the critical, moral, and theological relations of this subject of the Ancient Rechabites, the reader is referred to the following-named work:—

Third Edition, with Supplement, Price 6s.,

The Temperance Bible Commentary,

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Highly favourable reviews of the Temperance Bible Commentary have appeared in British and American publications, and several of the Scholars engaged in the Revision of the English Translation of the Bible have expressed themselves concerning it in language exceedingly eulogistic. Among the latest of the editorial notices are the following:—

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On the Education of Girls, and the Differences Which Should Exist Between the Training of Girls and of Boys.

MR PRESIDENT, LADIES, AND GENTLEMEN.—

However much I may ask your forbearance to-day towards this Paper as to the manner of its treatment, I shall certainly not apologise for occupying your time on its subject matter, viz., the education of our girls—our future women, because I feel that the subject is one of paramount importance to the 19th century. Nor is there any other of greater importance if we except the education of our boys. Now, as *that* has been in all times most sedulously attended to, and has formed the study and absorbed the energies of the most gigantic intellects in every age, we may reasonably suppose that the education of our boys has reached its highest point of development. For them little more remains to be done. It appears to me, indeed, that the old Greek, in the remote ages of antiquity, in the Titanic youth of the world, had attained to a most marvellous development both of his intellectual and physical qualities. Homer and Æschylus, Socrates and Plato, head that long roll of noble names which still tower far above the feebler minds of modern ages, and make one think that an advanced state of civilization is not the period most illumined by the divine fire of genius, or by the enthusiastic admiration of what is brave and grand and true! But this comparison will not hold with regard to women. Man attained early to his pride of place and height of intellectual dignity. Woman waited long. The five names which stand out most conspicuous in that portion of the world's history are Semiramis, Helen of Sparta, Sappho, Aspasia, Cleopatra; and these are only conspicuous for their *crimes*. They might be beautiful; they might be gifted; they might be splendid, with the tarnished splendour of a fallen star; but they were emphatically wicked. Some of them were steeped and dyed in sin! To what can we attribute this remarkable difference between the distinguished men and women of antiquity, but to the degraded and uneducated lives to which as a general rule the women of the first three empires were condemned? The remarkable reticence which ancient writers observe concerning their childhood and their early years, never alluding even to the existence of their own mothers, tell us but too plainly that the joys of the domestic hearth, the charms of the social family circle, were things unknown to them. In the small republic of Sparta some trouble was indeed bestowed upon the physical education of the women, but it was only in order that they might bear men. Under the fourth empire a slight amelioration in their condition took place; and now for the first time we hear of such women as Cornelia, Octavia the wife of Antony, and the mother and aunt of Seneca. Under the Jewish dispensation woman began first to assume her proper place as the help meet of man; but it was reserved for the Great Founder of our Faith to elevate the whole sex for ever by deigning to be born of a woman, by exalting all motherhood in her person,

and causing her, though made originally a little lower than the angels, a little lower than man, to be crowned with glory and honour! How best to fit her to fill that place to which her Saviour raised her—how best to carry out in integrity the education of our girls, our future women, in this the "ultima Thule" of the world, and in the high pressure 19th century—on this subject I will now endeavour to say a few words.

My subject naturally divides itself into three parts : Home education—school education—religious, as contrasted with secular, education.

There can be very little doubt that the education of a child should commence in its cradle, and that the first lesson inculcated should be that of instant, unquestioning *obedience;* and in proportion as this lesson is taught, or left untaught, so in the great majority of cases will the career of that child be successful or unsuccessful, one of happiness or one of misery. The second lesson certainly should be a habit of *reverence*, and consequently of reverential bearing towards those who are older, wiser, and superior to themselves. Now, the great failing of the youth of this colony of both sexes is a deficiency in these two fundamental principles. Where the fault lies is not easy to discover; whether in the times themselves, which daily become more opposed to reverence of any sort, or in the greater relaxation of discipline within the homes of the people; but that the present generation is less reverent and less obedient than the last, is a fact not to be overlooked. Yet I must reiterate that habits of obedience and reverence lie at the basis of all true education. To these should be added in the home training a habit of speaking the truth, a hatred of lying and deception in any form. The child so trained is fitted now for the second period of her life, the education of schools. In speaking of this part of a girl's training I think we ought to recognise the fact that we have not only to prepare our daughters to become in the future happy wives and mothers—that may or may not be—but our aim and object should be also to give them such an education as will best fit them to support themselves in whatever station of life they may be placed. Surely nothing can be more prejudicial to the inner and higher life of any girl than to present continually before her eyes, as the highest hope and aim of her existence, the acquisition of a husband! And yet we cannot deny that this is in fact the object of most girls' lives, for the simple reason that their want of a thorough and systematic education has given them little else to think about. Before our girls wrapped up in ecstatic thoughts of balls and beaux, there can but float dim visions of that life, simple and pure, and self-contained, which gave us Mrs Fletcher of Madely—which gave us a Florence Nightingale with all her noble sisterhood of martyrs, and Miss Jones, that delicately nurtured lady who lately lost her life in stern performance of duty among the fever wards of a workhouse hospital! We have had our Selwyns and our Pattesons—where are their female representatives? Where, throughout the length and breadth of this great colony, has there been found one woman who, forgetful of herself, relinquishing ease and luxury and friends and the refinements of life, has become absorbed in the one grand idea of relieving suffering humanity? And yet, if we wish the present generation of girls to rise above the dull level of mediocrity, we must give them models worthy of contemplation; we must teach them to aim at a high ideal; because the very efforts they make to reach it will develop in their own natures the excellence for which they are striving. For it is not that we are not capable of efforts and of excellence, but that we neglect our own powers. We forget that we are emanations fresh from the Divine Mind itself; we think too meanly of our own natures, and never, therefore, rise to the height of that ideal which is latent within us all.

Keeping this end in view, therefore, in the Education of Schools—viz., the attainment of a higher standard of thought and learning, I think we shall all agree in saying that the course of study must be *thorough*—the teachers duly qualified, the girls allowed to remain at school for a period sufficiently long to complete their course of study. I am afraid Sir Thomas More's Utopia would not be more difficult to establish here than my idea of a first-class school! The building should be large, lofty, well ventilated, standing in an ample play-ground sheltered by trees. In this there should be a croquet ground, a pole with horizontal swinging-bars, a space for rounders and for skipping, for battledore and shuttlecock, and "Les Graces." Athletic exercises for girls are not sufficiently encouraged in this city. I forbear to mention archery, which is a most healthful amusement, because in a school it would be too expensive and also dangerous. This building should be divided into four class rooms of not less than thirty feet, with antechambers attached to each, and a corridor closed in with glass running along one side for the use of the younger children in wet weather.

In the 1st class room girls under nine years of age, with a certificated teacher to every twelve children. The subjects taught to be reading, writing, copying on a slate from a book or black board, the first four rules of Arithmetic in their simplest forms, needle-work.

In the 2nd class room girls from nine to twelve years of age, with a certificated teacher to every twenty. The subjects taught in addition to the former to be English History, the Geography of New Zealand, Australasia and Europe, Dictation, the first four rules of Arithmetic in their advanced forms and the compound rules, the rudiments of Composition, French, and vocal and instrumental Music. In these two rooms the teachers should be exclusively females.

In the 3rd class room girls from twelve to fifteen years, with a certificated teacher to every thirty. The subjects taught in addition to the former to be—the higher rules of Arithmetic, Physical Geography, English

Literature, Drawing from models, written essays and compositions on given subjects, the rudiments of Astronomy and Botany, Roman and Continental Histories.

In this room the teachers and professors should be mixed, indifferently gentlemen or ladies. The idiosyncracies of the pupils should be carefully noted, and no girl allowed to pursue any study, particularly any accomplishment, for which she evinces a marked distaste; but her mind should be more particularly directed to that study and accomplishment in which she will be likely to excel. The text books used should not be numerous, but of the latest and best description. The teaching should be oral whenever possible. The lessons to be prepared at home should be one long lesson—at all events never more than two. The compositions, essays and exercises of the 2nd and 3rd classes should be invariably *written* and *prepared at school*. In the 4th class room for girls above fifteen, the subjects taught in the 3rd room should be carried on in higher text books, with the addition of Grecian history, Latin, painting in water-colours, millinery and dressmaking. For every subject there should be a separate teacher or professor. Lectures should be delivered on scientific subjects. Prizes and medals should be awarded for compositions in Latin, French and English, and for drawings and water-colours, especially for original designs or sketches from nature.

Hours of attendance in the first class room should be from ten to twelve, and from two to four. In the 2nd and 3rd, from ten to half-past twelve, and from two to four. In the 4th class room the hours of attendance should be from ten to one on two days of the week and from half-past one to four on three days of the week, alternately. This arrangement should be made because prolonged hours of study are detrimental to female growth and healthy development, until the period of womanhood is attained; and also to allow of the teachers in the junior room, who would be mostly pupil teachers, attending these classes, and so continuing their studies without expense until they were enabled to take out first class certificates; for to the pupil teachers we should look for the trained assistants and principals of the future.

Such is the course of study which would fit a girl for any station, or for any mode of life—would grace the drawing room of a duchess, or gather gold behind the counter of a milliner—for whatever talent had been given by God to any girl would surely be detected here, and fostered to its highest point of development.

The teachers of such a school as I have attempted to describe, I need hardly say, should be carefully selected. The qualifications necessary to form a good teacher are various, and not by any means comprised within a satisfactory examination by the Board, although that would be necessary. "Poeta nascitur non fit;" a really successful teacher is born, not made. I have known clever, well-educated women who were destitute of the power of imparting their knowledge to others. They had not the gift of teaching. A good teacher must not only be enthusiastic in her work, but she must try to excite a corresponding enthusiasm in her pupils. She must speak from her own heart, if she wishes to reach the hearts of others. Her character should command their respect. Her manner should win their love. Once make sure of the respect and affection of children, and it is easy to rule them. She must exercise the greatest patience, forbearance, and firmness; and every species of favoritism must be avoided. Punishment should be ignored among the elder girls, and their honor, their desire to please, their amour propre appealed to instead. Our colonial girls are as a rule intelligent beyond the average, quick of comprehension, having active and sensible minds, and generally possessing that greatest of all blessings, sound common sense; but they have not the same depth of intellect or fineness of passion and feeling that I remember in the girls of the mother land. They are not easily roused beyond the daily atmosphere of their happy, easy lives. They cannot understand the sublime sacrifice of Virginius—their pulses do not beat one throb more quickly when you tell them how the Three Hundred fell at Thermopylae, or how the Five Hundred rode obediently into the Valley of Death! Froude's unequalled description of Marie Stuart's last toilette in the great hall of Fotheringay will not excite them to any great amount of feeling or sympathy. Unfortunately for them they have no past to rouse them; they see around them no vestiges of time-honoured castles or cloistered cathedrals; whenever we appeal to any sympathies which rise beyond the common life around them, they are immediately at a disadvantage. It would be well if in our teaching we appealed more frequently to these unused but latent feelings of their natures, and so brought them into more active exercise. It is well to glow at some sublime action—it is well to burn with righteous anger at a base deed! I should imagine—although, of course, I cannot' know—that it would be easier to excite enthusiasm in the boys of this colony than in the girls; their course of study among the Latin authors is more likely to induce it. And here it may be well to notice the radical and important differences which ought to be made between the teaching of boys and girls, and which in my opinion militate greatly against any system of joint training.

An inspired writer, when speaking of national prosperity, desires, for his countrymen, even before the blessings of peace and of plenty, "that their sons might grow up as the *young plants*, and that their daughters might be like the *polished corners of the Temple*." Now, certainly there is a difference made between the two. He does not say that our children may grow up as the young plants, though he might well have done so, for the simile is beautiful and applicable; but he distinguishes between the sexes, and makes just the distinction which meets my own view. For what is our idea of a model boy? That he should be hardy, bold, and brave, quick in

his words as in his actions, determined and unflinching! And what is our idea of a model girl? That she should be quiet, modest, reflective, graceful in her person and her manners, and true in her heart's core to every outward grace of manner and person! The boy should be the hardy plant, strengthened by every breeze and sun; the girl the carefully polished marble which decorated the jointed corner stones of the Temple. Milton truly says of Adam and Eve:

"For contemplation he, and valour formed—
For softness she, and sweet attractive grace!"

More intellect is required to train the boy—more care is needed to bring up the girl. For instance, that public examination which I witnessed with much pleasure last Christmas at the Auckland College and Grammar School would be the very worst thing that could take place in a school of girls, and one in which no right-minded girl would show to advantage. All examinations of girls should be conducted in private, before the examiners, professors, and teachers only. To answer questions before an indiscriminate number of people whom she had never seen before would be a positive injury and injustice to a girl. To a boy it is a manifest service—his life is to be a public life, and it is well for him to begin his experiences as early as possible. I would have the girls use the same school authors, and participate freely in the numerous advantages which the boys of this city possess, and from which the girls are shamefully debarred; but the method of training should and must be totally different. The hours of study for the boys should be longer; the labour more severe. The studies which would keep a boy's brain in healthy exercise, would kill a girl or greatly enervate her constitution. Our object should not be to educate our females to become the *rivals* of men, or to jostle with them for place and station among the highways of the world. Whenever they have done so, they have come to grief. Madame de Longueville and Sarah, Duchess of Marlborough, were, each in her day, queens of political intrigue, and above queens in power and influence; and yet the end of each was singularly unhappy. The lives of great singers, too, and great actresses, are rarely blest or fortunate lives. The object of our education should be, not to teach her to look beyond her own sphere into the wider sphere of man, but to enable her to live the truest and highest life of which she is capable within her own particular dominion; to make her more self-contained, more self-reliant; to give her the option of a choice; to enable her to see that there is more than one way open to her; that she need neither sell herself, nor give herself reluctantly, but that she can afford to stand aside and wait until her second self is found; and if that should not be, such a woman will have hands and a mind and will to meet any and every fate.

"The age of chivalry is gone"—but I should be sorry to see obliterated from our national usages that chavalrous respect which every true gentleman will pay to what is frailer, weaker, more defenceless than himself. If girls, however, are made to take seats among boys, or women try to fill the place of men, it will surely follow, as a matter of course, that the men will defend themselves by forgetting that they are dealing with women. I cannot therefore agree with the American system of joint training. To this overtaxing of young girls' brains and this keen competition with men, may be ascribed the short-lived youth of the American women, who, as travellers tell us, are old and faded at thirty years of age.

I come now to the most important point of all, religious education. National piety and national prosperity generally go hand in hand. It is a bad omen for any country when it disclaims in its State teaching all mention of that Book which contains the germs and founts and springs of Knowledge. If it has indeed become necessary to institute, in this Province, a purely secular system from which the Bible is wholly excluded, then as a people we are not what we should be. We are forgetful of our highest dignity—our immortality; our highest moral obligation—to train up our children in the fear of God; our noblest heritage—the faith handed clown to us from our forefathers. Whilst I can see that no other system would have been permitted here, and that consequently it was a question of secular education or no education at all, I cannot neglect in a Paper like this to record my earnest protest against it. Not that I approve of using the Bible as a mere text book, or of confiding: the religious instruction of children solely to the master or mistress of a State school. But surely there are times, over and above the stipulated State hours, when the clergy of the different denominations might attend regularly, and, gathering the members of their flock together, might expound to them the Holy Scriptures. Unless the ministers of religion in this city are most earnest, most watchful, most active, the great mass of our children will grow up around us in a state of civilized heathenism worse than the heathenism of old. For in most cases they will not receive any religious instruction at home; it is useless to ignore that fact. And how small a proportion of the children taught by the State will enter a Sunday School! Never did such a responsibility as now rest upon the clergy of this country! Never was there such a necessity as now for enlarging the number of our Sunday Schools! I tremble to think of the future of some clever, adroit boy or girl who, educated by the State alone, shall use his or her keenness of knowledge and intellect for baser purposes only; ignorant of the

keynote without which all is discord in the glorious scale of the universe; oblivious of the keystone, wanting which all is tottering and incomplete in the wondrous arch of knowledge!

A few last words to the teachers of this Association, and I have done. The most arduous, wearing and exacting of all professions, ours is yet the one which exercises the greatest and most lasting influence upon the age in which we live. Our rulers may exclude religion from our schools, but the influence of a truly religious mind will always make itself felt wherever it is found. Children are most acute observers and imitators. Let us never forget that we can sway them both for good and evil; we can place before them perfect or imperfect examples; we can set our faces steadfastly against wrong-doing, or we can pass it over in silence. We are in the forefront of the hottest battle—we have to bear the burden and heat of the day. We can inculcate, if they have never been taught before, those fundamental principles of obedience, reverence, and truth, which, as I said, lie at the basis of all educaction; and our greatest consolation in every hour of doubt and despondency, and they must needs be many, will lie in the sense of duties honestly performed, of labours brought to a successful close.

"Something accomplished, something done,
Has earned a night's repose."

William Atkin. General Printer. High Street. Auckland.

The Religious Non-Observance of the Sabbath.

A Sermon by the Rev. F. W. Robertson,
To the Rev. D. M. Stuart, D.D., E. R. Cargill, Esq., Merchant, Rev. J. Copland, M.A., M.D. Ph. D., Rev. T. Roseby, M.A., L.L.D., Rev. John Gow, G. E. Barton, Esquire, Barrister, J. G. S. Grant, Esq., Author, J. P. Millar, Esq., the Rev. A. Blake, M.A., and all others whom it may concern.
Princes-street, Dunedin, 14*th March*, 1874.

"One man esteemeth one day above another: another esteemeth every day alike. Let every man be fully persuaded in his own mind."—Rom. xiv. 5.

THE selection of this text is suggested by one of the current topics of the day. Lately projects have been devised, one of which in importance surpasses all the rest, for providing places of public recreation for the people: and it has been announced, with the sanction of government, that such a place will be held open during a part at least of the day of rest. By a large section of sincerely religious persons this announcement has been received with considerable alarm, and strenuous opposition. It has seemed to them that such a desecration would be a national crime; for, holding the Sabbath to be God's sign between Himself and His people, they cannot but view the desecration of the sign as a forfeiture of His covenant, and an act which will assuredly call down national judgments. By the secular press, on the contrary, this proposal has been defended with considerable power. It has been maintained that the Sabbath is a Jewish institution; in its strictness, at all events, not binding on a Christian community. It has been urged with much force that we cannot consistently refuse to concede to the poor man publicly, that right of recreation which privately the rich man has long taken without rebuke, and with no protest on the part of the ministers of Christ. And it has been said, that such places of recreation will tend to humanize, which if not identical with Christianizing the population, is at least a step towards it.

Upon such a subject, where truth unquestionably does not lie upon the surface, it cannot be out of place if a minister of Christ endeavours to direct the minds of his congregation towards the formation of an opinion; not dogmatically, but humbly, remembering always that his own temptation is, from his very position as a clergyman, to view such matters, not so much in the broad light of the possibilities of actual life, as with the eyes of a recluse; from a clerical and ecclesiastical, rather than from a large and human point of view. For no minister of Christ has a right to speak oracularly. All that he can pretend to do is to give his judgment, as one that has obtained mercy of the Lord to be faithful. And on large national subjects there is perhaps no class so ill qualified to form a judgment with breadth as we, the clergy of the Church of England, accustomed as we are to move in the narrow circle of those who listen to us with forbearance and deference, and mixing but little in real life, till in our cloistered and inviolable sanctuaries we are apt to forget that it is one thing to lay down rules for a religious clique, and another to legislate for a great nation.

In the Church of Rome a controversy had arisen in the time of St. Paul, respecting the exact relation in which Christianity stood to Judaism; and consequently, the obligation of various Jewish institutions came to be discussed : among the rest the Sabbath day. One party maintained its abrogation: another continued obligation. "One man esteemeth one day above another; another esteemeth every day alike." Now, it is remarkable that in

his reply, the Apostle Paul, although his own views upon the question were decided and strong, passes no judgment of censure upon the practice of either of these parties, but only blames the uncharitable spirit in which the one "judged their brethren," as irreligious, and the other "set at naught" their stricter brethren as superstitious. He lays down, however, two principles for the decision of the matter : the first being the rights of Christian conviction, or the sacredness of the individual conscience—"Let every man be fully persuaded in his own mind;" the second, a principle unsatisfactory enough, and surprising, no doubt, to both, that there is such a thing as a religious observance, and also such a thing as a religious non-observance of the day—"He that regardeth the day, regardeth it unto the Lord; and he that regardeth not the day, to the Lord he doth not regard it." I shall consider,

I. St. Paul's own view upon the question.

II. His modifications of that view, in reference to separate cases.

I. St. Paul's own view. No one, I believe, who would read St. Paul's own writings with unprejudiced mind, could fail to come to the conclusion that he considered the Sabbath abrogated by Christianity. Not merely as modified in its stringency, but as totally repealed.

For example, see Col. ii. 10, 17: observe, he counts the Sabbath day among those institutions of Judaism which were shadows, and of which Christ was the realization, the substance or "body;" and he bids the Colossians remain indifferent to the judgment which would be pronounced upon their non-observance of such days. "Let no man judge you with respect to .... the Sabbath days."

He is more decisive still in the text. For it has been contended that in the former passage "Sabbath days" refers simply to the Jewish Sabbaths, which were super- seded by the Lord's day; and that the apostle does not allude at all to the new institution, which it is supposed had superseded it. Here, however, there can be no such ambiguity. "One man esteemeth *every* day alike;" and he only says, let him be fully persuaded in his own mind. "Every" day must include first days as well as last days of the week—Sundays as well as Saturdays, And, again, he even speaks of scrupulous adherence to particular days, as if it were giving up the very principle of Christianity : "Ye observe days, and months, and times, and years. I am afraid of you, lest I have bestowed labour upon you in vain." So that his objection was not to Jewish days, but to the very principle of attaching intrinsic sacredness to any days. All forms and modes of particularising the Christian life he reckoned as bondage under the elements or alphabet of the law.

Let us then understand the principle on which he declared the repeal of the Sabbath. He taught that the blood of Christ cleansed *all* things; therefore there was nothing *specially* clean. Christ had vindicated all for God : therefore there was no one thing more God's than another. For to assert one thing as God's more than another, is by implication to admit that other to be less God's.

The blood of Christ had vindicated God's parental right to all Humanity; therefore there could be no peculiar people. "There is neither Jew nor Greek, circumcision nor uncircumcision, Barbarian, Scythian, bond, nor free; but Christ is all and in all." It had proclaimed God's property in all places; therefore there could be no one place intrinsically holier than another. No human dedication, no human consecration, could localize God in space. Hence the first martyr quoted from the prophet : "Howbeit the Most High dwelleth not in temples made with hands; as saith the prophet, heaven is my throne, and earth is my footstool : what house will ye build for me? saith the Lord."

Lastly, the Gospel of Christ had sanctified all time; hence no time could be specially God's. For to assert that Sunday is more God's day than Monday, is to maintain by implication Monday is his less rightfully.

Here, however, let it be observed, it is perfectly possible, and not at all inconsistent with this, that for human convenience, and even human necessities, just as it became desirable to set apart certain places in which the noise of earthly business should not be heard for spiritual worship, so it should become desirable to set apart certain days for special worship. But then all such were defensible on the ground of wise and Christian expediency alone; they could not be placed on the ground of a Divine statute or command; they rested on the authority of the Church of Christ; and the power which had made could unmake them again.

Accordingly in early, we cannot say exactly how early, times, the Church of Christ felt the necessity of substi- luting something in place of the ordinances which had been repealed. And the Lord's day arose, not a day of compulsory rest; not such a day at all as modern sabbatarians suppose. Not a Jewish Sabbath; rather a day in many respects absolutely contrasted with the Jewish Sabbath.

For the Lord's Lay sprung, not out of a transference of the Jewish Sabbath from Saturday to Sunday; but rather out of the idea of making the week an imitation of the life of Christ. With the early Christians, the great conception was that of following their crucified and risen Lord : they set, as it were, the clock of time to the epochs of his history. Friday represented the Death in which all Christians daily die, and Sunday the Resurrection in which all Christians daily rise to higher life. What Friday and Sunday were to the week, that Good Friday and Easter Sunday were to the year. And thus, in larger or smaller cycles, all time represented to the early Christians the mysteries of the Cross and the Risen Life Hidden in Humanity. And as the sunflower

turns from morning till evening to the sun, so did the early Church turn for ever to her Lord, transforming week and year into a symbolical representation of His Spiritual Life.

Carefully distinguish this, the true historical view of the origin of the Lord's Day, from a mere transference of a Jewish Sabbath from one day to another. For St. Paul's teaching is distinct and clear, that the .Sabbath is annulled, and to urge the observance of the day as indispensable to salvation, was, according to him, to Judaize; "to turn again to the weak and beggarly elements, whereunto they desired to be in bondage.

II. The modifications of this view.

The first modification has reference to those who conscientiously observed the day. He that observeth the day observeth it to the Lord. Let him act then on that conviction: "Let him be fully persuaded in his own mind." There is therefore a religious *observance* of the Sabbath day possible.

We are bound by the spirit of the Fourth commandment, so far as we are in the same spiritual state as they to whom it was given. The spiritual intent of Christianity is to worship God every day in the spirit. But had this law been given in all its purity to the Jews, instead of turning every week day into a Sabbath, they would have transformed every Sabbath into a week day; with no special day fixed for worship, they would have spent every day without worship. Their hearts were too dull for a devotion so spiritual and pure. Therefore a law was given, specialising a day, in order to lead them to the broader truth that every day is God's.

Now, so far as we are in the Jewish state, the Fourth commandment, even in its rigour and strictness, is wisely used by us; nay, we might say, indispensable. For who is he who needs not the day? He is the man so rich in love, so conformed to the mind of Christ, so elevated into the sublime repose of heaven that he needs no carnal ordinances at all, nor the assistance of one day in seven to kindle spiritual feelings, seeing he is, as it were, all his life in heaven already.

And, doubtless, such the Apostle Paul expected the Church of Christ to be. Anticipating the Second Advent at once; not knowing the long centuries of slow progress that were to come, his heart would have sunk within him could he have been told that at the end of eighteen centuries the Christian Church would be still observing days, and months, and times, and years, and still more, needing them. *Needing* them, I say. For the Sabbath was made for man. God made it for men in a certain spiritual state because they needed it. The need, therefore, is deeply hidden in human nature. He who can dispense with it must be holy and spiritual indeed. And he who, still unholy and unspiritual, would yet dispense with it, is a man who would fain be wiser than his Maker. We, Christians as we are, still need the law, both in its restraints and in its aids to our weakness. No man, therefore, who knows himself, but will gladly and joyfully use the institution. No man who knows the need of his brethren will wantonly desecrate it, or recklessly hurt even their scruples respecting its observance. And no such man can look with aught but grave and serious apprehensions on such an innovation upon English customs of life and thought, as the proposal to give public and official countenance to a scheme which will *invite* millions, I do not say to an irreligious, but certainly an unreligious use of the day of rest.

This, then, is the first modification of the broad view of a repealed sabbath. Repealed though it be, there is such a thing as a religious non-observance of it. And provided that those who are stricter than we in their views of its obligation, observe it not from superstition, not in abridgement of Christian liberty, nor from moroseness, we are bound in Christian charity to yield them all respect and honour. Let them act out their conscientious convictions, Let not him that observeth not despise him that observeth.

The second modification is, that there is such a thing as a *religious non-observance* of the Sabbath. St. Paul does not say that every non-observance of the Sabbath is religious, but that he who, not observing it, observeth it not to the Lord, is, because acting on conscientious conviction, as acceptable as the others, who, in obedience to what they believe to be His will, observe it.

But he who, not trying to serve God on any day, gives Sunday to toil or pleasure, certainly observes not the day; but his non-observance is not rendered to the Lord. He may be free from superstition, but it is not Christ who has made him free. Nor is he one of whom St. Paul would have said that his liberty on the Sabbath is as acceptable as his brother's conscientious scrupulosity.

Here, then, we are at issue with the popular defence of public recreations on the Sabbath day; not so much with respect to the practice, as with respect to the grounds on which the practice is approved. They claim liberty; but it is not Christian liberty. Like St. Paul, they demand a license for non-observance; only, it is not "non-observance to the Lord." For distinguish well. The abolition of Judaism is not necessarily the establishment of Christianity: to do away with the Sabbath day in order to substitute a nobler, truer, more continuous Sabbath, even the Sabbath of all time given up to God, is well. But to do away with the special Rights of God to the Sabbath, in order merely to substitute the Rights of Pleasure, or the Eights of Mammon, or even the license of profligacy and drunkenness, that, methinks, is not St. Paul's Christian liberty!"

The second point on which we join issue is the assumption that public places of recreation, which humanize, will therefore Christianize the people. It is taken for granted that architecture, sculpture, and the wonders of Nature and Art which such buildings will contain, have a direct or indirect tendency to lead to true

devotion. Only in a very limited degree is there truth in this at all. Christianity will humanize; we are not so sure that humanizing will Christianize. Let us be clear upon this matter. Esthetics are not Religion. It is one thing to civilize and polish; it is another thing to Christianize. The Worship of the Beautiful is not the Worship of Holiness; nay, I know not whether the one may not have a tendency to disincline from the other. At least, such was the history of Ancient Greece. Greece was the home of the Arts, the sacred ground on which the worship of the Beautiful was carried to its perfection. Let those who have read the history of her decline and fall, who have perused the debasing works of her later years, tell us how music, painting, poetry, the arts, softened and debilitated and sensualized the nation's heart. Let them tell us how, when Greece's last and greatest man was warning in vain against the foe at her gates, and demanding a manlier and a more heroic disposition to sacrifice, that most polished and humanized people, sunk in trade and sunk in pleasure, were squandering enormous sums upon their buildings and their esthetics, their processions and their people's palaces, till the flood came, and the liberties of Greece were trampled down for ever beneath feet of the Macedonian Conqueror.

No! the change of a nation's heart is not to be effected by the infusion of a taste for artistic grace. "Other foundation can no man lay than that is laid, which is Christ Jesus." Not Art, but the Cross of Christ. Simpler manners, purer lives; more self-denial; more earnest sympathy with the classes that lie below us.

On the other hand, we dissent from the views of those who would arrest such a project by petitions to the legislature on these grounds.

I. It is a return beckwards to Judaism and Law. It may be quite true that, as we suspect, such non-observance of the day is not to the Lord: but only a scheme of mere pecuniary speculation. Nevertheless there is such a thing as a religious non-observance of the day: and we dare not "judge another man's servant: to his own master he standeth or falleth." We dare not assert the perpetual obligation of the Sabbath, when an inspired apostle has declared it abrogated. We dare not refuse a public concession of that kind of recreation to the poor man which the rich have long not hesitated to take in their sumptuous mansions and pleasure-grounds, unrebuked by the ministers of Christ, who seem to be touched to the quick only, when the desecration of the Sabbath is loud and vulgar. We cannot substitute a statute law for a repealed law of God. We may think, and we do, that there is much which may lead to dangerous consequences in this innovation: but we dare not treat it as a crime.

The second ground on which we are opposed to the ultra-rigour of Sabbath observance, especially when it becomes coercive, is the danger of injuring the conscience. It is wisely taught by St. Paul that he who does anything with offence, i.e., with a feeling that it is wrong, even does wrong. To him it is wrong, even though it be not wrong abstractedly. Therefore it is always dangerous to multiply restrictions and requirements beyond what is essential, because men feeling themselves hemmed in, break the artificial barrier, but breaking it with a sense of guilt do thereby become hardened in conscience and prepared for transgression against commandments which are divine and of eternal obligation. Hence it is that the criminal has so often in his confessions traced his deterioration in crime to the first step of breaking the Sabbath day, and no doubt with accurate truth. But what shall we infer from this? Shall we infer as is so often done upon the platform and in religious books, that it proves the everlasting obligation of the Sabbath? Or, shall we with a far truer philosophy of the human soul, infer, in the language of St. Peter, that we have been laying on him a yoke which neither we nor our fathers were able to bear?—in the language of St. Paul that the motions of sin were by the law, that the rigorous rule was itself the stimulating moving cause of the sin; and that when the young man, worn out with his week's toil, first stole out into the fields to taste the fresh breath of a spring day, he did it with a vague secret sense of transgression, and that having as it were, drawn his sword in defiance against the established code of the religious world, he felt that from thenceforth there was for him no return, and so he became an outcast, his sword against every man and every man's sword against him? I believe this to be the true account of the matter; and believing it, I cannot but believe that the false Jewish notions of the Sabbath day which are prevalent, have become exceedingly pernicious to the morals of the country.

Lastly, I remind you of the danger of mistaking a "positive" law for amoral one. The danger that is proportion-ably to the vehemence with which the law positive is enforced, the sacredness of moral laws is neglected. A positive law, in theological language, is a law laid down, tor special purposes, and corresponds with statute laws in things civil. The laws of excise and the laws of quarantine depend for their force upon the will of the legislature, and when repealed are binding no more. But a moral law is one binding for ever, which a statute law may declare, but can neither make nor un-make.

Now, when men are rigorous in the enforcement and reverence paid to laws positive, the tendency is a corresponding indifference to the laws of eternal right. The written supersedes in their hearts, the moral. The mental history of the ancient Pharisees, who observed the Sabbath and tithed mint, anise, and cummin, neglecting justice, mercy, and truth, is the history of a most dangerous but universal tendency of the human heart. And so, many a man, whose heart swells with what he thinks pious horror when he sees the letter

delivered or the train run upon the Sabbath day, can pass through the streets at night, undepressed and un-shocked by the evidences of the wide-spreading profligacy which has eaten deep into his ocuntry's heart.

And many a man who would gaze upon the domes of a Crystal Palace, rising above the trees, with somewhat of the same feeling with which he would look on a temple dedicated to Juggernaut, and who would fancy that something of the spirit of an ancient prophet was burning in his bosom, when his lips pronounced the Woe! Woe! of a coming doom, would sit calmly in a social circle of English life, and scarcely feel uneasy in listening to its un-charitableness and its slanders: would hear without one throb of indignation, the common dastardly condemnation of the weak for sins which are venial in the strong : would survey the relations of the rich and poor in this country, and remain calmly satisfied that there is nothing false in them, unbrotherly and wrong. No, my brethern! let us think clearly and strongly on this matter. It may be that God has a controversy with this people. It may be as they say, that our Father will chasten us by the sword of the foreigner. But if He does, and if judgments are in store for our country, they will fall,—not because the correspondence of the land is carried on upon the Sabbath-day : nor because Sunday trains are not arrested by the legislature: nor because a public permission is given to the working classes for a few hours' recreation on the day of rest :—but because we are selfish men: and because we prefer Pleasure to Duty, and Traffic to Honour; and because we love our party more than our Church, and our Church more than our Christianity; and our Christianity more than Truth, and ourselves more that all. These are the things that defile a nation: but the labour and the recreation of its Poor, these are not the things that defile a nation.

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Inaugural Address

Delivered at the Forty-Fourth Annual Meeting Of The British Association for the Advancement of Science *Held at Belfast, August*, 1874

By Professor John Tyndall, D.C.L., LL.D. President of the Association.

George Robertson Melbourne 1874

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The British Association for the Advancement of Science. Session 1874.

Inaugural Address

By Prof. John Tyndall, D.C. L., LL.D., F.R.S.

AN impulse inherent in primeval man turned his thoughts and questionings betimes towards the sources of natural phenomena. The same impulse, inherited and intensified, is the spur of scientific action to-day. Determined by it, by a process of abstraction from experience we form physical theories which lie beyond the pale of experience, but which satisfy the desire of the mind to see every natural occurrence resting upon a cause. In forming their notions of the origin of things, our earliest historic (and doubtless, we might add, our pre-historic) ancestors pursued, as far as their intelligence permitted, the same course. They also fell back upon experience, but with this difference—that the particular experiences which furnished the weft and woof of their theories were drawn, not from the study of nature, but from what lay much closer to them—the observation of men. Their theories accordingly took an anthropomorphic form. To supersensual beings, which, "however potent and invisible, were nothing but a species of human creatures, perhaps raised from among mankind, and retaining all human passions and appetites,"

Hume, "Natural History of Religion."

were handed over the rule and governance of natural phenomena.

Tested by observation and reflection, these early notions failed in the long run to satisfy the more penetrating intellects of our race. Far in the depths of history we find men of exceptional power differentiating themselves from the crowd, rejecting these anthropomorphic notions, and seeking to connect natural phenomena with their physical principles. But long prior to these purer efforts of the understanding the merchant had been abroad, and rendered the philosopher possible; commerce had been developed, wealth amassed, leisure for travel and for speculation secured, while races educated under different conditions, and therefore differently informed and endowed, had been stimulated and sharpened by mutual contact. In those regions where the commercial aristocracy of ancient Greece mingled with its eastern neighbours, the sciences were born, being nurtured and developed by free-thinking and courageous men. The state of things to be

displaced may be gathered from a passage of Euripides quoted by Hume. "There is nothing in the world; no glory, no prosperity. The gods toss all into confusion; mix everything with its reverse, that all of us, from our ignorance and uncertainty, may pay them the more worship and reverence." Now, as science demands the radical extirpation of caprice and the absolute reliance upon law in nature, there grew with the growth of scientific notions a desire and determination to sweep from the field of theory this mob of gods and demons, and to place natural phenomena on a basis more congruent with themselves.

The problem which had been previously approached from above was now attacked from below; theoretic effort passed from the super to the sub-sensible. It was felt that to construct the universe in idea it was necessary to have some notion of its constituent parts—of what Lucretius subsequently called the "First Beginnings." Abstracting again from experience, the leaders of scientific speculation reached at length the pregnant doctrine of atoms and molecules, the latest developments of which were set forth with such power and clearness at the last meeting of the British Association. Thought no doubt had long hovered about this doctrine before it attained the precision and completeness which it assumed in the mind of Democritus,

Born 460 B.C.

a philosopher who may well for a moment arrest our attention. "Few great men," says Lange, in his excellent "History of Materialism," a work to the spirit and the letter of which I am equally indebted, "have been so despitefully used by history as Democritus. In the distorted images sent down to us through unscientific traditions there remains of him almost nothing but the name of the 'laughing philosopher,' while figures of immeasurably smaller significance spread themselves at full length before us." Lange speaks of Bacon's high appreciation of Democritus—for ample illustrations of which I am indebted to my excellent friend Mr. Spedding, the learned editor and biographer of Bacon. It is evident, indeed, that Bacon considered Democritus to be a man of weightier metal than either Plato or Aristotle, though their philosophy "was noised and celebrated in the schools, amid the din and pomp of professors." It was not they, but Genseric and Attila and the barbarians, who destroyed the atomic philosophy. "For at a time when all human learning had suffered shipwreck, these planks of Aristotelian and Platonic philosophy, as being of a lighter and more inflated substance, were preserved and come down to us, while things more solid sank and almost passed into oblivion."

The principles enunciated by Democritus reveal his uncompromising antagonism to those who deduced the phenomena of nature from the caprices of the gods. They are briefly these:—1. From nothing comes nothing. Nothing that exists can be destroyed. All changes are due to the combination and separation of molecules. 2. Nothing happens by chance. Every occurrence has its cause from which it follows by necessity. 3. The only existing things are the atoms and empty space; all else is mere opinion. 4. The atoms are infinite in number, and infinitely various in form; they strike together, and the lateral motions and whirlings which thus arise are the beginnings of worlds. 5. The varieties of all things depend upon the varieties of their atoms, in number, size, and aggregation. 6. The soul consists of free, smooth, round atoms, like those of fire. These are the most mobile of all. They interpenetrate the whole body, and in their motions the phenomena of life arise. Thus the atoms of Democritus are individually without sensation; they combine in obedience to mechanical laws; and not only organic forms, but the phenomena of sensation and thought are also the result of their combination.

That great enigma, "the exquisite adaptation of one part of an organism to another part, and to the conditions of life," more especially the construction of the human body, Democritus made no attempt to solve. Empedocles, a man of more fiery and poetic nature, introduced the notion of love and hate among the atoms to account for their combination and separation. Noticing this gap in the doctrine of Democritus, he struck in with the penetrating thought, linked, however, with some wild speculation, that it lay in the very nature of those combinations which were suited to their ends (in other words, in harmony with their environment) to maintain themselves, while unfit combinations, having no proper habitat, must rapidly disappear. Thus more than 2,000 years ago the doctrine of the "survival of the fittest," which in our day, not on the basis of vague conjecture, but of positive knowledge, has been raised to such extraordinary significance, had received at all events partial enunciation.

Lange, 2nd edit., p. 23.

Epicurus,

Born 342 B.C.

said to be the son of a poor schoolmaster at Samos, is the next dominant figure in the history of the atomic philosophy. He mastered the writings of Democritus, heard lectures in Athens, returned to Samos, and subsequently wandered through various countries. He finally returned to Athens, where he bought a garden and surrounded himself by pupils, in the midst of whom he lived a pure and serene life, and died a peaceful death. His philosophy was almost identical with that of Democritus; but he never quoted either friend or foe. One main object of Epicurus was to free the world from superstition and the fear of death. Death he treated with indifference. It merely robs us of sensation. As long as we are, death is not; and when death is, we are not. Life has no more evil for him who has made up his mind that it is no evil not to live. He adored the gods, but not in

the ordinary fashion. The idea of divine power, properly purified, he thought an elevating one. Still he taught, "Not he is godless who rejects the gods of the crowd, but rather he who accepts them." The gods were to him eternal and immortal beings, whose blessedness excluded every thought of care or occupation of any kind. Nature pursues her course in accordance with everlasting laws, the gods never interfering. They haunt

"The lucid interspace of world and world
Where never creeps a cloud or moves a wind,
Nor ever falls the least white star of snow,
Nor ever lowest roll of thunder moans,
Nor sound of human sorrow mounts to mar
Their sacred everlasting calm."
Tennyson's "Lucretius."

Lange considers the relation of Epicurus to the gods subjective; the indication probably of an ethical requirement of his own nature. We cannot read history with open eyes, or study human nature to its depths, and fail to discern such a requirement. Man never has been, and he never will be, satisfied with the operations and products of the understanding alone; hence physical science cannot cover all the demands of his nature. But the history of the efforts made to satisfy these demands might be broadly described as a history of errors—the error consisting in ascribing fixity to that which is fluent, which varies as we vary, being gross when we are gross, and becoming, as our capacities widen, more abstract and sublime. On one great point the mind of Epicurus was at peace. He neither sought nor expected, here or hereafter, any personal profit from his relation to the gods. And it is assuredly a fact that loftiness and serenity of thought may be promoted by conceptions which involve no idea of profit of this kind. "Did I not believe," said a great man to me once, "that an Intelligence is at the heart of things, my life on earth would be intolerable." The utterer of these words is not, in my opinion, rendered less noble but more noble, by the fact that it was the need of ethical harmony here, and not the thought of personal profit hereafter, that prompted his observation.

A century and a half after the death of Epicurus, Lucretius

Born 99 B. C.

wrote his great poem, "On the Nature of Things," in which he, a Roman, developed with extraordinary ardour the philosophy of his Greek predecessor. He wishes to win over his friend Memnius to the school of Epicurus; and although he has no rewards in a future life to offer, although his object appears to be a purely negative one, he addresses his friend with the heat of an apostle. His object, like that of his great forerunner, is the destruction of superstition; and considering that men trembled before every natural event as a direct monition from the gods, and that everlasting torture was also in prospect, the freedom aimed at by Lucretius might perhaps be deemed a positive good. "This terror," he says, "and darkness of mind must be dispelled, not by the rays of the sun and glittering shafts of day, but by the aspect and the law of nature." He refutes the notion that anything can come out of nothing, or that that which is once begotten can be recalled to nothing. The first beginnings, the atoms, are indestructible, and into them all things can be dissolved at last. Bodies are partly atoms and partly combinations of atoms; but the atoms nothing can quench. They are strong in solid singleness, and by their denser combination all things can be closely packed and exhibit enduring strength. He denies that matter is infinitely divisible. We come at length to the atoms, without which, as an imperishable substratum, all order in the generation and development of things would be destroyed.

The mechanical shock of the atoms being in his view the all-sufficient cause of things, he combats the notion that the constitution of nature has been in any way determined by intelligent design. The interaction of the atoms throughout infinite time rendered all manner of combinations possible. Of these the fit ones persisted, while the unfit ones disappeared. Not after sage deliberation did the atoms station themselves in their right places, nor did they bargain what motions they should assume. From all eternity they have been driven together, and after trying motions and unions of every kind, they fell at length into the arrangements out of which this system of things has been formed. His grand conception of the atoms falling silently through immeasurable ranges of space and time suggested the nebular hypothesis to Kant, its first propounder. "If you will apprehend and keep in mind these things, Nature, free at once, and rid of her haughty lords, is seen to do all things spontaneously of herself, without the meddling of the gods."

Monro's translation. In his criticism of this work (*Contemporary Review*, 1867), Dr. Hayman does not appear to be aware of the really sound and subtile observations on which the reasoning of Lucretius, though erroneous, sometimes rests.

During the centuries between the first of these three philosophers and the last, the human intellect was active in other fields than theirs. The Sophists had run through their career. At Athens had appeared the three

men, Socrates, Plato, and Aristotle, whose yoke remains to some extent unbroken to the present hour. Within this period also the School of Alexandria was founded, Euclid wrote his "Elements," and he and others made some advance in optics. Archimedes had propounded the theory of the lever and the principles of hydrostatics. Pythagoras had made his experiments on the harmonic intervals, while astronomy was immensely enriched by the discoveries of Hipparchus, who was followed by the historically more celebrated Ptolemy. Anatomy had been made the basis of scientific medicine; and it is said by Draper

"History of the Intellectual Development of Europe," p. 295.

that vivisection then began. In fact, the science of ancient Greece had already cleared the world of the fantastic images of divinities operating capriciously through natural phenomena. It had shaken itself free from that fruitless scrutiny "by the internal light of the mind alone," which had vainly sought to z a knowledge of ultimate causes. Instead of accidental observation, it had introduced observation with a purpose; instruments were employed to aid the senses; and scientific method was rendered in a great measure complete by the union of induction and experiment.

What, then, stopped its victorious advance? Why was the scientific intellect compelled, like an exhausted soil, to lie fallow for nearly two millenniums before it could re-gather the elements necessary to its fertility and strength? Bacon has already let us know one cause; Whewell ascribes this stationary period to four causes—obscurity of thought, servility, intolerance of disposition, enthusiasm of temper; and he gives striking examples of each.

History of the Inductive Sciences," vol. i.

But these characteristics must have had their causes, which lay in the circumstances of the time. Rome and the other cities of the empire had fallen into moral putrefaction. Christianity had appeared, offering the gospel to the poor, and by moderation if not asceticism of life, practically protesting against the profligacy of the age. The sufferings of the early Christians and the extraordinary exaltation of mind which enabled them to triumph over the diabolical tortures to which they were subjected,

Depicted with terrible vividness in Renin's "Antichrist."

must have left traces not easily effaced. They scorned the earth, in view of that "building of God, that house not made with hands, eternal in the heavens." The Scriptures which ministered to their spiritual needs were also the measure of their science. When, for example, the celebrated question of antipodes came to be discussed, the Bible was with many the ultimate court of appeal. Augustine, who flourished A.D. 400, would not deny the rotundity of the earth, but he would deny the possible existence of inhabitants at the other side, "because no such race is recorded in Scripture among the descendants of Adam." Arch-bishop Boniface was shocked at the assumption of a "world of human beings out of the reach of the means of salvation." Thus reined in, science was not likely to make much progress. Later on, the political and theological strife between the Church and civil governments, so powerfully depicted by Draper, must have done much to stifle investigation.

Whewell makes many wise and brave remarks regarding the spirit of the Middle Ages. It was a menial spirit. The seekers after natural knowledge had forsaken that fountain of living waters, the direct appeal to nature by observation and experiment, and had given themselves up to the re-manipulation of the notions of their predecessors. It was a time when thought had become abject, and when the acceptance of mere authority led, as it always does in science, to intellectual death. Natural events, instead of being traced to physical, were referred to moral causes, while an exercise of the phantasy, almost as degrading as the spiritualism of the present day, took the place of scientific speculation. Then came the mysticism of the Middle ages, magic, alchemy, the Neo-platonic philosophy, with its visionary though sublime attractions, which caused men to look with shame upon their own bodies as hindrances to the absorption of the creature in the blessedness of the Creator. Finally came the scholastic philosophy, a fusion, according to Lange, of the least mature notions of Aristotle with the Christianity of the west. Intellectual immobility was the result. As a traveller without a compass in a fog may wander long, imagining he is making way, and find himself, after hours of toil, at his starting-point, so the schoolmen, having tied and untied the same knots, and formed and dissipated the same clouds, found themselves at the end of centuries in their old position.

With regard to the influence wielded by Aristotle in the Middle Ages, and which, though to a less extent, he still wields, I would ask permission to make one remark. When the human mind has achieved greatness and given evidence of extraordinary power in any domain, there is a tendency to credit it with similar power in all other domains. Thus theologians have found comfort and assurance in the thought that Newton dealt with the question of revelation, forgetful of the fact that the very devotion of his powers, through all the best years of his life, to a totally different class of ideas, not to speak of any natural disqualification, tended to render him less instead of more competent to deal with theological and historic questions. Goethe, starting from his established greatness as a poet, and indeed from his positive discoveries in natural history, produced a profound impression among the painters of Germany when he published his "Farbenlehre," in which he endeavoured to over-throw Newton's theory of colours. This theory he deemed so obviously absurd, that he considered its author a

charlatan, and attacked him with a corresponding vehemence of language. In the domain of natural history Goethe had made really considerable discoveries; and we have high authority for assuming that had he devoted himself wholly to that side of science he might have reached in it an eminence comparable with that which he attained as a poet. In sharpness of observation, in the detection of analogies, however apparently remote, in the classification and organization of facts according to the analogies discerned, Goethe possessed extraordinary powers. These elements of scientific inquiry fall in with the discipline of the poet. But, on the other hand, a mind thus richly endowed in the direction of natural history, may be almost shorn of endowment as regards the more strictly called physical and mechanical sciences. Goethe was in this condition. He could not formulate distinct mechanical conceptions; he could not see the force of mechanical reasoning; and in regions where such reasoning reigns supreme he became a mere *ignis fatuus* to those who followed him.

I have sometimes permitted myself to compare Aristotle with Goethe, to credit the Stagirite with an almost superhuman power of amassing and systematizing facts, but to consider him fatally defective on that side of the mind in respect to which incompleteness has been justly ascribed to Goethe. Whewell refers the errors of Aristotle, not to a neglect of facts, but to "a neglect of the idea appropriate to the facts; the idea of mechanical cause, which is force, and the substitution of vague or inapplicable notions, involving only relations of space or emotions of wonder." This is doubtless trae; but the word "neglect" implies mere intellectual misdirection, whereas in Aristotle, as in Goethe, it was not, I believe, misdirection, but sheer natural incapacity which lay at the root of his mistakes. As a physicist, Aristotle displayed what we should consider some of the worst attributes of a modern physical investigator—indistinctness of ideas, confusion of mind, and a confident use of language, which led to the delusive notion that he had really mastered his subject, while he as yet had tailed to grasp even the elements of it. He put words in the place of things, subject in the place of object. He preached induction without practising it, inverting the true order of inquiry by passing from the general to the particular, instead of from the particular to the general. He made of the universe a closed sphere, in the centre of which he fixed the earth, proving from general principles, to his own satisfaction and that of the world for nearly 2,000 years, that no other universe was possible. His notions of motion were entirely unphysical. It was natural or unnatural, better or worse, calm or violent—no real mechanical conception regarding it lying at the bottom of his mind. He affirmed that a vacuum could not exist, and proved that if it did exist motion in it would be impossible. He determined *à priori* how many species of animals must exist, and showed on general principles why animals must have such and such parts. When an eminent contemporary philosopher, who is far removed from errors of this kind, remembers these abuses of the *à priori* method, he will be able to make allowance for the jealousy of physicists as to the acceptance of so-called *à priori* truths. Aristotle's errors of detail were grave and numerous. He affirmed that only in man we had the beating of the heart, that the left side of the body was colder than the right, that men have more teeth than women, and that there is an empty space, not at the front, but at the back of every man's head.

There is one essential quality in physical conceptions which was entirely wanting in those of Aristotle and his followers. I wish it could be expressed by a word untainted by its associations; it signifies a capability of being placed as a coherent picture before the mind. The Germans express the act of picturing by the word *vorstellen*, and the picture they call a *vorstel- lung*. We have no word in English which comes nearer to our requirements than *imagination*, and, taken with its proper limitations, the word answers very well; but, as just intimated, it is tainted by its associations, and therefore objectionable to some minds. Compare, with reference to this capacity of mental presentation, the case of the Aristotelian, who refers the ascent of water in a pump to Nature's abhorrence of a vacuum, with that of Pascal when he proposed to solve the question of atmospheric pressure by the ascent of the Puy de Dome. In the one case the terms of the explanation refuse to fall into place as a physical image; in the other the image is distinct, the fall and rise of the barometer being clearly figured as the balancing of two varying and opposing pressures.

During the drought of the Middle Ages in Christendom, the Arabian intellect, as forcibly shown by Draper, was active. With the intrusion of the Moors into Spain, cleanliness, order, learning, and refinement took the place of their opposites. When smitten with the disease, the Christian peasant resorted to a shrine; the Moorish one to an instructed physician. The Arabs encouraged translations from the Greek philosophers, but not from the Greek poets. They turned in disgust "from the lewdness of our classical mythology, and denounced as an unpardonable blasphemy all connection between the impure Olympian Jove and the Most High God." Draper traces still further than Whewell the Arab elements in our scientific terms, and points out that the under garment of ladies retains to this hour its Arab name. He gives examples of what Arabian men of science accomplished, dwelling particularly on Alhazen, who was the first to correct the Platonic notion that rays of light are emitted by the eye. He discovered atmospheric refraction, and points out that we see the sun and moon after they have set. He explains the enlargement of the sun and moon, and the shortening of the vertical diameters of both these bodies, when near the horizon. He is aware that the atmosphere decreases in density with increase of height, and actually fixes its height at 58½ miles. In the Book of the Balance Wisdom, he sets forth the connection

between the weight of the atmosphere and its increasing density. He shows that a body will weigh differently in a rare and a dense atmosphere: he considers the force with which plunged bodies rise through heavier media. He understands the doctrine of the centre of gravity, and applies it to the investigation of balances and steelyards. He recognizes gravity as a force, though he falls into the error of making it diminish at the distance, and of making it purely terrestrial. He knows the relation between the velocities, spaces, and times of falling bodies, and has distinct ideas of capillary attraction. He improves the hydrometer. The determination of the densities of the bodies as given by Alhazen approaches very closely to our own. "I join," says Draper, "in the pious prayer of Alhazen, that in the day of judgment the All-Merciful will take pity on the soul of Abur-Raihân, because he was the first of the race of men to construct a table of specific gravities." If all this be historic truth (and I have entire confidence in Dr. Draper), well may he "deplore the systematic manner in which the literature of Europe has contrived to put out of sight our scientific obligations to the Mahommedans."

"Intellectual Development of Europe,' p 359.

Towards the close of the stationary period a word-weariness, if I may so express it, took more and more possession of men's minds. Christendom had become sick of the school philosophy and its verbal wastes, which led to no issue, but left the intellect in everlasting haze. Here and there was heard the voice of one impatiently crying in the wilderness, "Not unto Aristotle, not unto subtle hypotheses, not unto Church, Bible, or blind tradition, must we turn for a knowledge of the universe, but to the direct investigation of nature by observation and experiment." In 1543 the epoch-making work of Copernicus on the paths of the heavenly bodies appeared. The total crash of Aristotle's closed universe with the earth at its centre followed as a consequence; and "the earth moves" became a kind of watchword among intellectual freemen. Copernicus was the Canon of the Church of Frauenburg, in the diocese of Ermeland. For three-and-thirty years he had withdrawn himself from the world and devoted himself to the consolidation of his great scheme of the solar system. He made its blocks eternal; and even to those who feared it and desired its overthrow it was so obviously strong that they refrained from meddling with it. In the last year of the life of Copernicus his book appeared : it is said that the old man received a copy of it a few days before his death, and then departed in peace.

The Italian philosopher Giordano Bruno was one of the earliest converts to the new astronomy. Taking Lucretius as his exemplar, he revived the notion of the infinity of worlds; and combining with it the doctrine of Copernicus, reached the sublime generalization that the fixed stars are suns, scattered numberless through space and accompanied by satellites, which bear the same relation to them as the earth does to our sun, or our moon to our earth. This was an expansion of transcendant import; but Bruno came closer than this to our present line of thought. Struck with the problem of the generation and maintenance of organisms, and duly pondering it, he came to the conclusion that nature in her productions does not imitate the technic of man. Her process is one of unravelling and unfolding. The infinity of forms under which matter appears were not imposed upon it by an external artificer; by its own intrinsic force and virtue it brings these forms forth. Matter is not the mere naked, empty *capacity* which philosophers have pictured her to be, but the universal mother, who brings forth all things as the fruit of her own womb.

This outspoken man was originally a Dominican monk. He was accused of heresy, and had to fly, seeking refuge in Geneva, Paris, England, and Germany. In 1592 he fell into the hands of the Inquisition at Venice. He was imprisoned for many years, tried, degraded, excommunicated, and handed over to the civil power, with the request that he should be treated gently and "without the shedding of blood." This meant that he was to be burnt; and burnt accordingly he was, on Feb. 16, 1600. To escape a similar fate, Galileo, thirty-three years afterwards, abjured, upon his knees, and with his hand on the holy gospels, the helio- centric doctrine. After Galileo came Kepler, who from his German home defied the power beyond the Alps. He traced out from pre-existing observations the laws of planetary motion. The problem was thus prepared for Newton, who bound those empirical laws together by the principle of gravitation.

During the Middle Ages the doctrine of atoms had to all appearance vanished from discussion. In all probability it held its ground among sober-minded and thoughtful men, though neither the Church nor the world was prepared to hear of it with tolerance. Once, in the year 1348, it received distinct expression. But retractation by compulsion immediately followed, and thus discouraged, it slumbered till the 17th century, when it was revived by a contemporary of Hobbes and Descartes, the Père Gassendi.

The analytic and synthetic tendencies of the human mind exhibit themselves throughout history, great writers ranging themselves sometimes on the one side, sometimes on the other. Men of lofty feelings, and minds open to the elevating impressions produced by nature as a whole, whose satisfaction, therefore, is rather ethical than logical, have leaned to the synthetic side; while the analytic harmonizes best with the more precise and more mechanical bias which seeks the satisfaction of the under-standing. Some form of pantheism was usually adopted by the one, while a detached Creator, working more or less after the manner of men, was often assumed by the other.

* Boyle's model of the universe was the Strasburg clock with an outside artificer. Goethe, on the other

hand, sang

"Ihm ziemt's die Welt im Innern zu bewegen,
Natur in sich, sich in Natur zu hegen."

The same repugnance to the clockmaker conception is manifest in Carlyle.
Gassendi is hardly to be ranked with either. Having formerly acknowledged God as the first great cause, he immediately drops the idea, applies the known laws of mechanics to the atoms, and thence deduces all vital phenomena. God who created earth and water, plants and animals, produced in the first place a definite number of atoms, which constituted the seed of all things. Then began that series of combinations and decompositions which goes on at the present day, and which will continue in the future. The principle of every change resides in matter. In artificial productions the moving principle is different from the material worked upon; but in nature the agent works within, being the most active and mobile part of the material itself. Thus this bold ecclesiastic, without incurring the censure of the Church or the world, contrives to outstrip Mr. Darwin. The same cast of mind which caused him to detach the Creator from His universe led him also to detach the soul from the body, though to the body he ascribes an influence so large as to render the soul almost unnecessary. The aberrations of reason were in his view an affair of the material brain. Mental disease is brain disease; but then the immortal reason sits apart, and cannot be touched by the disease. The errors of madness are errors of the instrument, not of the performer.

It may be more than a mere result of education, connecting itself probably with the deeper mental structure of the two men, that the idea of Gassendi, above enunciated, is substantially the same as that expressed by Prof. Clerk Maxwell at the close of the very noble lecture delivered by him at Bradford last year. According to both philosophers, the atoms, if I understand aright, are the *prepared materials*, the "manufactured articles," which, formed by the skill of the Highest, produce by their subsequent interaction all the phenomena of the material world. There seems to be this difference, however, between Gassendi and Maxwell. The one *postulates*, the other *infers* his first cause. In his manufactured articles, Prof. Maxwell finds the basis of an induction which enables him to scale philosophic heights considered inaccessible by Kant, and to take the logical step from the atoms to their Maker.

The atomic doctrine, in whole or in part, was entertained by Bacon, Descartes, Hobbes, Locke, Newton, Boyle, and their successors, until the chemical law of multiple proportions enabled Dalton to confer upon it an entirely new significance. In our day there are secessions from the theory, but it still stands firm. Only a year or two ago Sir William Thomson, with characteristic penetration, sought to determine the sizes of the atoms, or rather to fix the limits between which their sizes lie; while only last year the discourses of Williamson and Maxwell illustrate the present hold of the doctrine upon the foremost scientific minds. What these atoms, self-moved and self-posited, can and cannot accomplish in relation to life, is at the present moment the subject of profound scientific thought. I doubt the legitimacy of Maxwell's logic; but it is impossible not to feel the ethic glow with which his lecture concludes. There is, moreover, a Lucretian grandeur in his description of the steadfastness of the atoms :—"Natural causes, as we know, are at work, which tend to modify, if they do not at length destroy, all the arrangements and dimensions of the earth and the whole solar system. But though in the course of ages catastrophes have occurred and may yet occur in the heavens, though ancient systems may be dissolved and new systems evolved out of their ruins, the molecules out of which these systems are built, the foundation stones of the material universe, remain unbroken and unworn."

Ninety years subsequent to Gassendi the doctrine of bodily instruments, as it may be called, assumed immense importance in the hands of Bishop Butler, who, in his famous "Analogy of Religion," developed, from his own point of view, and with con-summate sagacity, a similar idea. The bishop still influences superior minds; and it will repay us to dwell for a moment on his views. He draws the sharpest distinction between our real selves and our bodily instruments. He does not, as far as I remember, use the word soul, possibly because the term was so hackneyed in his day, as it had been for many generations previously. But he speaks of "living powers," "perceiving" or "percipient powers," "moving agents," "ourselves," in the same sense as we should employ the term soul. He dwells upon the fact that limbs may be removed and mortal diseases assail the body, while the mind, almost up to the moment of death, remains clear. He refers to sleep and to swoon, where the "living powers" are suspended but not destroyed. He considers it quite as easy to conceive of an existence out of our bodies as in them; that we may animate a succession of bodies, the dissolution of all of them having no more tendency to dissolve our real selves, or "deprive us of living faculties—the faculties of perception and action—than the dissolution of any foreign matter which we are capable of receiving impressions from, or making use of, for the common occasions of life." This is the key of the bishop's position: "Our organized bodies are no more a part of ourselves than any other matter around us." In proof of this he calls attention to the

use of glasses, which "prepare objects" for the "percipient power" exactly as the eye does. The eye itself is no more percipient than the glass, and is quite as much the instrument of the true self, and also as foreign to the true self, as the glass is. "And if we see with our eyes only in the same manner as we do with glasses, the like may justly be concluded from analogy of all our senses."

Lucretius, as you are aware, reached a precisely opposite conclusion: and it certainly would be interesting, if not profitable, to us all, to hear what he would or could urge in opposition to the reasoning of the bishop. As a brief discussion of the point will enable us to see the bearings of an important question, I will here permit a disciple of Lucretius to try the strength of the bishop's position, and then allow the bishop to retaliate, with the view of rolling back, if he can, the difficulty upon Lucretius. Each shall state his case fully and frankly; and you shall be umpire between them. The argument might proceed in this fashion:—

"Subjected to the test of mental presentation *(Vorstellung)* your views, most honoured prelate, would present to many minds a great, if not an insuperable, difficulty. You speak of 'living powers,' 'percipient or perceiving powers,' and 'ourselves;' but can you form a mental picture of any one of these apart from the organism through which it is supposed to act? Test yourself honestly, and see whether you possess any faculty that would enable you to form such a conception. The true self has a local habitation in each of us; thus localized, must it not possess a form? If so, what form? Have you ever for a moment realized it? When a leg is amputated the body is divided into two parts; is the true self in both of them or in one? Thomas Aquinas might say in both; but not you, for you appeal to the consciousness associated with one of the two parts to prove that the other is foreign matter. Is consciousness, then, a necessary element of the true self? If so, what do you say to the case of the whole body being deprived of consciousness? If not, then on what grounds do you deny any portion of the true self to the severed limb? It seems very singular that, from the beginning to the end of your admirable book (and no one admires its sober strength more than I do), you never once mention the brain or nervous system. You begin at one end of the body, and show that its parts may be removed without prejudice to the perceiving power. What if you begin at the other end, and remove, instead of the leg, the brain? The body, as before, is divided into two parts; but both are now in the same predicament, and neither can be appealed to to prove that the other is foreign matter. Or, instead of going so far as to remove the brain itself, let a certain portion of its bony covering be removed, and let a rhythmic series of pressure and relaxations of pressure be applied to the soft substance. At every pressure 'the faculties of perception and of action' vanish; at every relaxation of pressure they are restored. Where, during the intervals of pressure, is the perceiving power? I once had the discharge of a Leyden battery passed unexpectedly through me : I felt nothing, but was simply blotted out of conscious existence for a sensible interval. Where was my true self during that interval? Men who have recovered from lightning-stroke have been much longer in the same state; and indeed in cases of ordinary concussion of the brain, days may elapse during which no experience is registered in consciousness. Where is the man himself during the period of insensibility? You may say that I beg the question when I assume the man to have been unconscious, that he was really conscious all the time and has simply forgotten what had occurred to him. In reply to this, I can only say that no one need shrink from the worst tortures that superstition ever invented if only so felt and so remembered. I do not think your theory of instruments goes at all to the bottom of the matter. A telegraph operator has his instruments, by means of which he converses with the world; our bodies possess a nervous system, which plays a similar part between the perceiving powers and external things. Cut the wires of the operator, break his battery, demagnetize his needle : by this means you certainly sever his connection with the world; but inasmuch as these are real instruments, their destruction does not touch the man who uses them. The operator survives, *and he knows that he survives*. What is it, I would ask, in the human system that answers to this conscious survival of the operator when the battery of the brain is so disturbed as to produce insensibility, or when it is destroyed altogether?

"Another consideration, which you may consider slight, presses upon me with some force. The brain may change from health to disease, and through such a change the most exemplary man may be converted into a debauchee or a murderer. My very noble and approved good master had, as you know, threatenings of lewdness introduced into his brain by his jealous wife's philter; and sooner than permit himself to run even the risk of yielding to these base promptings he slew himself. How could the hand of Lucretius have been thus turned against himself if the real Lucretius remained as before? Can the brain, or can it not, act in this distempered way without the intervention of the immortal reason? If it can, then it is a prime mover which requires only healthy regulation to render it reasonably self-acting, and there is no apparent need of your immortal reason at all. If it cannot, then the immortal reason, by its mischievous activity in operating upon a broken instrument, must have the credit of committing every imaginable extravagance and crime. I think, if you will allow me to say so, that the gravest consequences are likely to flow from your estimate of the body. To regard the brain as you would a staff or an eyeglass; to shut your eyes to all its mystery, to the perfect correlation that reigns between its condition and our consciousness, to the fact that a slight excess or defect of blood in it produces that very swoon to which you refer, and that in relation to it our meat, and drink, and air, and exercise have a perfectly

transcendental value and significance; to forget all this does, I think, open a way to innumerable errors in our habits of life, and may possibly in some cases initiate and foster that very disease, and consequent mental ruin, which a wiser appreciation of this mysterious organ would have avoided."

I can imagine the bishop thoughtful after hearing this argument. He was not the man to allow anger to mingle with the consideration of a point of this kind. After due consideration, and having strengthened himself by that honest contemplation of the facts which was habitual with him, and which includes the desire to give even adverse facts their due weight, I can suppose the bishop to proceed thus:—"You will remember that in the 'Analogy of Religion,' of which you have so kindly spoken, I did not profess to prove anything absolutely, and that I over and over again acknowledged and insisted on the smallness of our knowledge, or rather the depth of our ignorance, as regards the whole system of the universe. My object was to show my deistical friends who set forth so eloquently the beauty and beneficence of Nature and the Ruler thereof, while they had nothing but scorn for the so-called absurdities of the Christian scheme, that they were in no better condition than we were, and that for every difficulty they found upon our side, quite as great a difficulty was to be found on theirs. I will now with your permission adopt a similar line of argument. You are a Lucretian, and from the combination and separation of atoms deduce all terrestrial things, including organic forms and their phenomena. Let me tell you in the first instance how far I am prepared to go with you. I admit that you can build crystalline forms out of this play of molecular force; that the diamond, amethyst, and snow-star are truly wonderful structures which are thus produced. I will go further, and acknowledge that even a tree or flower might in this way be organized. Nay, if you can show me an animal without sensation, I will concede to you that it also might be put together by the suitable play of molecular force.

"Thus far our way is clear, but now comes my difficulty. Your atoms are individually without sensation, much more are they without intelligence. May I ask you, then, to try your hand upon this problem? Take your dead hydrogen atoms, your dead oxygen atoms, your dead carbon atoms, your dead nitrogen atoms, your dead phosphorus atoms, and all the other atoms, dead as grains of shot, of which the brain is formed. Imagine them separate and sensationless; observe them running together and forming all imaginable combinations. This, as a purely mechanical process, is *seeable* by the mind. But can you see, or dream, or in any way imagine, how out of that mechanical act, and from these individually dead atoms, sensation, thought, and emotion are to arise? You speak of the difficulty of mental presentation in my case; is it less in yours? I am not all bereft of this *Vorstellungs-kraft* of which you speak. I can follow a particle of musk until it reaches the olfactory nerve; I can follow the waves of sound until their tremors reach the water of the labyrinth, and set the otoliths and Corti's fibres in motion; I can also visualize the waves of ether as they cross the eye and hit the retina. Nay, more, I am able to follow up to the central organ the motion thus imparted at the periphery, and to see in idea the very molecules of the brain thrown into tremors. My insight is not baffled by these physical processes. What baffles me, what I find unimaginable, transcending every faculty I possess—transcending, I humbly submit, every faculty *you* possess—is the notion that out of those physical tremors you can extract things so utterly incongruous with them as sensation, thought, and emotion. You may say, or think, that this issue of consciousness from the clash of atoms is not more incongruous than the flash of light from the union of oxygen and hydrogen. But I beg to say that it is. For such incongruity as the flash possesses is that which I now force upon your attention. The flash is an affair of consciousness, the objective counterpart of which is a vibration. It is a flash only by our interpretation. *You* are the cause of the apparent incongruity; and *you* are the thing that puzzles me. I need not remind you that the great Leibnitz felt the difficulty which I feel, and that to get rid of this monstrous deduction of life from death he displaced your atoms by his monads, and which were more or less perfect mirrors of the universe, and out of the summation and integration of which he supposed all the phenomena of life—sentient, intellectual, and emotional—to arise.

"Your difficulty, then, as I see you are ready to admit, is quite as great as mine. You cannot satisfy the human understanding in its demand for logical continuity between molecular processes and the phenomena of consciousness. This is a rock on which materialism must inevitably split whenever it pretends to be a complete philosophy of life. What is the moral, my Lucretian? You and I are not likely to indulge in ill-temper in the discussion of these great topics, where we see so much room for honest differences of opinion. But there are people of less wit, or more bigotry (I say it with humility) on both sides, who are ever ready to mingle anger and vituperation with such discussions. There are, for example, writers of note and influence at the present day who are not ashamed to assume the 'deep personal sin' of a great logician to be the cause of his unbelief in a theologic dogma. And there are others who hold that we, who cherish our noble Bible, wrought as it has been into the constitution of our forefathers, and by inheritance into us, must necessarily be hypocritical and insincere. Let us disavow and discountenance such people, cherishing the unswerving faith that what is good and true in both our arguments will be preserved for the benefit of humanity, while all that is bad or false will disappear."

It is worth remarking that in one respect the bishop was a product of his age. Long previous to his day the

nature of the soul had been so favourite and general a topic of discussion, that when the students of the University of Paris wished to know the leanings of a new professor, they at once requested him to lecture upon the soul. About the time of Bishop Butler the question was not only agitated but extended. It was seen by the clear-witted men who entered this arena that many of their best arguments applied equally to brutes and men. The bishop's arguments were of this character. He saw it, admitted it, accepted the consequences, and boldly embraced the whole animal world in his scheme of immortality.

Bishop Butler accepted with unwavering trust the chronology of the Old Testament, describing it as "confirmed by the natural and civil history of the world, collected from common historians, from the state of the earth, and from the late inventions of arts and sciences." These words mark progress: they must seem somewhat hoary to the bishop's successors of to-day.

Only to some; for there are dignitaries who even now speak of the earth's rocky crust as so much building material prepared for man at the Creation. Surely it is time that this loose language should cease.

It is hardly necessary to inform you that since his time the domain of the naturalist has been immensely extended—the whole science of geology, with its astounding revelations regarding the life of the ancient earth, having been created. The rigidity of old conceptions has been relaxed, the public mind being rendered gradually tolerant of the idea that not for six thousand, nor for sixty thousand, nor for six thousand thousand, but for æons embracing untold millions of years, this earth has been the theatre of life and death. The riddle of the rocks has been read by the geologist and palæontologist, from sub-cambrian depths to the deposits thickening over the sea-bottoms of to-day. And upon the leaves of that stone book are, as you know, stamped the characters, plainer and surer than those formed by the ink of history, which carry the mind back into abysses of past time compared with which the periods which satisfied Bishop Butler cease to have a visual angle. Everybody now knows this; all men admit it; still, when they were first broached these verities of science found loud-tongued denunciators, who proclaimed not only their baselessness considered scientifically, but their immorality considered as questions of ethics and religion: the Book of Genesis had stated the question in a different fashion; and science must necessarily go to pieces when it clashed with this authority. And as the seed of the thistle produces a thistle, and nothing else, so these objectors scatter their germs abroad, and reproduce their kind, ready to play again the part of their intellectual progenitors, to show the same virulence, the same ignorance, to achieve for a time the same success, and finally to suffer the same inexorable defeat. Sure the time must come at last when human nature in its entirety, whose legitimate demands it is admitted science alone cannot satisfy, will find interpreters and expositors of a different stamp from those rash and ill-informed persons who have been hitherto so ready to hurl themselves against every new scientific revelation, lest it should endanger what they are pleased to consider theirs.

The lode of discovery once struck, those petrified forms in which life was at one time active, increased to multitudes and demanded classification. The general fact soon became evident that none but the simplest forms of life lie lowest down, that as we climb higher and higher among the superimposed strata more perfect forms appear. The change, however, from form to form was not continuous—but by steps, some small, some great. "A section," says Mr. Huxley, "a hundred feet thick will exhibit at different heights a dozen species of ammonite, none of which passes beyond its particular zone of limestone, or clay, into the zone below it, or into that above it." In the presence of such facts it was not possible to avoid the question, Have these forms, showing, though in broken stages and with many irregularities, this unmistakable general advance, been subjected to no continuous law of growth or variation? Had our education been purely scientific, or had it been sufficiently detached from influences which, however ennobling in another domain, have always proved hindrances and delusions when introduced as factors into the domain of physics, the scientific mind never could have swerved from the search for a law of growth, or allowed itself to accept the anthropomorphism which regarded each successive stratum as a kind of mechanic's bench for the manufacture of new species out of all relation to the old.

Biassed, however, by their previous education, the great majority of naturalists invoked a special creative act to account for the appearance of each new group of organisms. Doubtless there were numbers who were clear-headed enough to see that this was no explanation at all, that in point of fact it was an attempt, by the introduction of a greater difficulty, to account for a less. But having nothing to offer in the way of explanation, they for the most part held their peace. Still the thoughts of reflecting men naturally and necessarily simmered round the question. De Maillet, a contemporary of Newton, has been brought into notice by Prof. Huxley as one who "had a notion of the modifiability of living forms." In my frequent conversations with him, the late Sir Benjamin Brodie, a man of highly philosophic mind, often drew my attention to the fact that, as early as 1794, Charles Darwin's grandfather was the pioneer of Charles Darwin. In 1801, and in subsequent years, the celebrated Lamarck, who produced so profound an impression on the public mind through the vigorous exposition of his views by the author of "Vestiges of Creation," endeavoured to show the development of species out of changes of habit and external condition. In 1813, Dr. Wells, the founder of our present theory of dew, read before the Royal Society a paper in which, to use the words of Mr. Darwin, "he distinctly recognizes

the principle of natural selection; and this is the first recognition that has been indicated." The thoroughness and skill with which Wells pursued his work, and the obvious independence of his character rendered him long ago a favourite with me; and it gave me the liveliest pleasure to alight upon this additional testimony to his penetration. Prof. Grant, Mr. Patrick Matthew, Von Buch, the author of the "Vestiges," D'Halloy, and others,

In 1855 Mr. Herbert Spencer ("Principles of Psychology," 2nd edit., vol. i., p. 465) expressed "the belief that life under all its forms has arisen by an unbroken evolution, and through the instrumentality of what are called natural causes."

by the enunciation of views more or less clear and correct, showed that the question had been fermenting long prior to the year 1858, when Mr. Darwin and Mr. Wallace simultaneously but independently placed their closely concurrent views upon the subject before the Linnean Society.

These papers were followed in 1859 by the publication of the first edition of "The Origin of Species." All great things come slowly to the birth. Copernicus, as I informed you, pondered his great work for thirty-three years. Newton for nearly twenty years kept the idea of Gravitation before his mind; for twenty years also he dwelt upon his discovery of Fluxions, and doubtless would have continued to make it the object of his private thought had he not found that Leibnitz was upon his track. Darwin for two-and-twenty years pondered the problem of the origin of species, and doubtless he would have continued to do so had he not found Wallace upon his track.

The behaviour of Mr. Wallace in relation to this subject has been dignified in the highest degree.

A concentrated but full and powerful epitome of his labours was the consequence. The book was by no means an easy one; and probably not one in every score of those who then attacked it had read its pages through, or were competent to grasp their significance if they had. I do not say this merely to discredit them; for there were in those days some really eminent scientific men, entirely raised above the heat of popular prejudice, willing to accept any conclusion that science had to offer, provided it was duly backed by fact and argument, and who entirely mistook Mr. Darwin's views. In fact, the work needed an expounder; and it found one in Mr. Huxley. I know nothing more admirable in the way of scientific exposition than those early articles of his on the origin of species. He swept the curve of discussion through the really significant points of the subject, enriched his exposition with profound original remarks and reflections, often summing up in; a single pithy sentence an argument which a less compact mind! would have spread over pages. But there is one impression made by the book itself which no exposition of it, however luminous, can convey; and that is, the impression of the vast amount of labour, both of observation and of thought, implied in its production. Let us glance at its principles.

It is conceded on all hands that what are called varieties are continually produced. The rule is probably without exception. No chick and no child is in all respects and particulars the counterpart of its brother or sister; and in such differences we have "variety" incipient. No naturalist could tell how far this variation could be carried; but the great mass of them held that never by any amount of internal or external change, nor by the mixture of both, could the offspring of the same progenitor so far deviate from each other as to constitute different species. The function of the experimental philosopher is to combine the conditions of nature and to produce her results; and this was the method of Darwin.

The first step only towards experimental demonstration has been taken. Experiments now begun might, a couple of centuries hence, furnish data of incalculable value, which ought to be supplied to the science of the future.

He made himself acquainted with what could, without any manner of doubt, be done in the way of producing variation. He associated himself with pigeon fanciers—bought, begged, kept, and observed every breed that he could obtain. Though derived from a common stock, the diversities of these pigeons were such that "a score of them might be chosen which, if shown to an ornithologist, and he were told that they were wild birds, would certainly be ranked by him as well-defined species." The simple principle which guides the pigeon-fancier, as it does the cattle-breeder, is the selection of some variety that strikes his fancy, and the propagation of this variety by inheritance. With his eye still upon the particular appearance which he wishes to exaggerate, he selects it as it re-appears in successive broods, and thus adds increment to increment until an astonishing amount of divergence from the parent type is effected. Man in this case does not produce the *elements* of the variation. He simply observes them, and by selection adds them together until the required result has been obtained. "No man," says Mr. Darwin, "would ever try to make a fantail till he saw a pigeon with a tail developed in : some slight degree in an unusual manner, or a pouter until he saw a pigeon with a crop of unusual size." Thus nature gives the hint, man acts upon it, and by the law of inheritance exaggerates the deviation.

Having thus satisfied himself by indubitable facts that the organization of an animal or of a plant (for precisely the same treatment applies to plants) is to some extent plastic, he passes from variation under domestication to variation under nature. Hitherto we have dealt with the adding together of small changes by

the conscious selection of man. Can Nature thus select? Mr. Darwin's answer is, "Assuredly she can." The number of living things produced is far in excess of the number that can be supported; hence at some period or other of their lives there must be a struggle for existence; and what is the infallible result? If one organism were a perfect copy of the other in regard to strength, skill, and agility, external conditions would decide. But this is not the case. Here we have the fact of variety offering itself to nature, as in the former instance it offered itself to man; and those varieties which are least competent to cope with surrounding conditions will infallibly give way to those that are competent. To use a familiar proverb, the weakest comes to the wall. But the triumphant fraction again breeds to over-production, transmitting the qualities which secured its maintenance, but transmitting them in different degrees. The struggle for food again supervenes, and those to whom the favourable quality has been transmitted in excess will assuredly triumph. It is easy to see that we have here the addition of increments favourable to the individual still more rigorously carried out than in the case of domestication; for not only are unfavourable specimens not selected by nature, but they are destroyed. This is what Mr. Darwin calls "natural selection," which "acts by the preservation and accumulation of small inherited modifications, each profitable to the preserved being." With this idea he interpenetrates and leavens the vast store of facts that he and others have collected. We cannot, without shutting our eyes through fear or prejudice, fail to see that Darwin is here dealing, not with imaginary, but with true causes; nor can we fail to discern what vast modifications may be produced by natural selection in periods sufficiently long. Each individual increment may resemble what mathematicians call a "differential" (a quantity indefinitely small); but definite and great changes may obviously be produced by the integration of these infinitesimal quantities through practically infinite time.

If Darwin, like Bruno, rejects the notion of creative power acting after human fashion, it certainly is not because he is unacquainted with the numberless exquisite adaptations on which this notion of a supernatural artificer has founded. His book is a repository of the most startling facts of this description. Take the marvellous observation which he cites from Dr. Crüger, where a bucket with an aperture, serving as a spout, is formed in an orchid. Bees visit the flower: in eager search of material for their combs they push each other into the bucket, the drenched ones escaping from their involuntary bath by the spout. Here they rub their backs against the viscid stigma of the flower and obtain glue; then against the pollen-masses, which are thus stuck to the back of the bee and carried away. "When the bee, thus provided flies to another flower, or to the same flower a second time, and is pushed by its comrades into the bucket, and then crawls out by the passage, the pollen-mass upon its back necessarily comes first into contact with the viscid stigma," which takes up the pollen; and this is how that orchid is fertilised. Or take this other case of the *Catasetum*. "Bees visit these flowers in order to gnaw the labellum; on doing this they inevitably touch a long, tapering, sensitive projection. This, when touched, transmits a sensation or vibration to a certain membrane, which is instantly ruptured, setting free a spring, by which the pollen-mass is shot forth like an arrow in the right direction, and adheres by its viscid extremity to the back of the bee." In this way the fertilising pollen is spread abroad.

It is the mind thus stored with the choicest materials of the teleologist that rejects teleology, seeking to refer these wonders to natural causes. They illustrate, according to him, the method of nature, not the "technic" of a man-like artificer. The beauty of flowers is due to natural selection. Those that distinguish themselves by vividly contrasting colours from the surrounding green leaves are most readily seen, most frequently visited by insects, most often fertilised, and hence most favoured by natural selection. Coloured berries also readily attract the attention of birds and beasts, which feed upon them, spread their manured seeds abroad, thus giving trees and shrubs possessing such berries a greater chance in the struggle for existence.

With profound analytic and synthetic skill, Mr. Darwin investigates the cell-making instinct of the hive-bee. His method of dealing with it is representative. He falls back from the more perfectly to the less perfectly developed instinct—from the hive-bee to the humble-bee, which uses its own cocoon as a comb, and to classes of bees of intermediate skill, endeavouring to show how the passage might be gradually made from the lowest to the highest. The saving of wax is the most important point in the economy of bees. Twelve to fifteen pounds of dry sugar are said to be needed for the secretion of a single pound of wax. The quantities of nectar necessary for the wax must therefore be vast; and every improvement of constructive instinct which results in the saving of wax is a direct profit to the insect's life. The time that would otherwise be devoted to the making of wax is now devoted to the gathering and storing of honey for winter food. He passes from the humble-bee with its rude cells, through the Melipona with its more artistic cells, to the hive-bee with its astonishing architecture. The bees place themselves at equal distances apart upon the wax, sweep and excavate equal spheres round the selected points. The spheres intersect, and the planes of intersection are built up with thin laminæ. Hexagonal cells are thus formed. This mode of treating such questions is, as I have said, representative. He habitually retires from the more perfect and complex, to the less perfect and simple, and carries you with him through stages of *perfecting*, adds increment to increment of infinitesimal change, and in this way gradually breaks down your reluctance to admit that the exquisite climax of the whole could be a result

of natural selection.

Mr. Darwin shirks no difficulty; and, saturated as the subject was with his own thought, he must have known, better than his critics, the weakness as well as the strength of his theory. This of course would be of little avail were his object a temporary dialectic victory instead of the establishment of a truth which he means to be everlasting. But he takes no pains to disguise the weakness he has discerned; nay, he takes every pains to bring it into the strongest light. His vast resources enable him to cope with objections started by himself and others, so as to leave the final impression upon the reader's mind that if they be not completely answered they certainly are not fatal. Their negative force being thus destroyed, you are free to be influenced by the vast positive mass of evidence he is able to bring before you. This largeness of knowledge and readiness of resource render Mr. Darwin the most terrible of antagonists. Accomplished naturalists have levelled heavy and sustained criticisms against him—not always with the view of fairly weighing his theory, but with the express intention of exposing its weak points only. This does not irritate him. He treats every objection with a soberness and thoroughness which even Bishop Butler might be proud to imitate, surrounding each fact with its appropriate detail, placing it in its proper relations, and usually giving it a significance which, as long as it was kept isolated, failed to appear. This is done without a trace of ill-temper. He moves over the subject with the passionless strength of a glacier, and the grinding of the rocks is not always without a counterpart in the logical pulverization of the objector. But though in handling this mighty theme all passion has been stilled, there is an emotion of the intellect incident to the discernment of new truth which often colours and warms the pages of Mr. Darwin. His success has been great; and this implies not only the solidity of his work, but the preparedness of the public mind for such a revelation. On this head a remark of Agassiz impressed me more than anything else. Sprung from a race of theologians, this celebrated man combated to the last the theory of natural selection. One of the many times I had the pleasure of meeting him in the United States was at Mr. Winthrop's beautiful residence at Brookline, near Boston. Rising from luncheon, we all halted as if by a common impulse in front of a window, and continued there a discussion which had been started at table. The maple was in its autumn glory; and the exquisite beauty of the scene outside seemed, in my case, to interpenetrate without disturbance the intellectual action. Earnestly, most sadly, Agassiz turned and said to the gentlemen standing round, "I confess that I was not prepared to see this theory received as it has been by the best intellects of our time. Its success is greater than I could have thought possible."

In our day great generalizations have been reached. The theory of the origin of species is but one of them. Another, of still wider grasp and more radical significance, is the doctrine of the Conservation of Energy, the ultimate philosophical issues of which are as yet but dimly seen—that doctrine which "binds nature fast in fate" to an extent not hitherto recognized, exacting from every antecedent its equivalent consequent, from every consequent its equivalent antecedent, and bringing vital as well as physical phenomena under the dominion of that law of causal connection which, as far as the human understanding has yet pierced, asserts itself everywhere in nature. Long in advance of all definite experiment upon the subject, the constancy and in-destructibility of matter had been affirmed; and all subsequent experience justified the affirmation. Later researches extended the attribute of indestructibility to force. This idea, applied in the first instance to inorganic, rapidly embraced organic nature. The vegetable world, though drawing almost all its nutriment from invisible sources, was proved incompetent to generate anew either matter or force. Its matter is for the most part transmuted air; its force transformed solar force. The animal world was proved to be equally uncreative, all its motive energies being referred to the combustion of its food. The activity of each animal as a whole was proved to be the transferred activities of its molecules. The muscles were shown to be stores of mechanical force, potential until unlocked by the nerves, and then resulting in muscular contractions. The speed at which messages fly to and fro along the nerves was determined, and found to be, not as had been previously supposed, equal to that of light or electricity, but less than the speed of a flying eagle.

This was the work of the physicist: then came the conquests of the comparative anatomist and physiologist, revealing the structure of every animal, and the function of every organ in the whole biological series, from the lowest zoophyte up to man. The nervous system had been made the object of profound and continued study, the wonderful and, at bottom, entirely mysterious controlling power which it exercises over the whole organism, physical and mental, being recognized more and more. Thought could not be kept back from a subject so profoundly suggestive. Besides the physical life dealt with by Mr. Darwin, there is a psychical life presenting similar gradations, and asking equally for a solution. How are the different grades and orders of mind to be accounted for? What is the principle of growth of that mysterious power which on our planet culminates in Reason? These are questions which, though not thrusting themselves so forcibly upon the attention of the general public, had not only occupied many reflecting minds, but had been formally broached by one of them before the "Origin of Species" appeared.

With the mass of materials furnished by the physicist and physiologist in his hands, Mr. Herbert Spencer, twenty years ago, sought to graft upon this basis a system of psychology; and two years ago a second and

greatly amplified edition of his work appeared. Those who have occupied themselves with the beautiful experiments of Plateau, will remember that when two spherules of olive-oil suspended in a mixture of alcohol and water of the same density as the oil, are brought together, they do not immediately unite. Something like a pellicle appears to be formed around the drops, the rupture of which is immediately followed by the coalescence of the globules into one. There are organisms whose vital actions are almost as purely physical as that of these drops of oil. They come into contact and fuse themselves thus together. From such organisms to others a shade higher, and from these to others a shade higher still, and on through an ever-ascending series, Mr. Spencer conducts his argument. There are two obvious factors to be here taken into account—the creature and the medium in which it lives, or, as it is often expressed, the organism and its environment Mr. Spencer's fundamental principle is, that between these two factors there is incessant interaction. The organism is played upon by the environment, and is modified to meet the requirements of the environment. Life he defines to be "a continuous adjustment of internal relations to external relations."

In the lowest organisms we have a kind of tactual sense diffused over the entire body; then, through impressions from without and their corresponding adjustments, special portions of the surface become more responsive to stimuli than others. The senses are nascent, the basis of all of them being that simple tactual sense which the sage Democritus recognized 2,300 years ago as their common progenitor. The action of light, in the first instance, appears to be a mere disturbance of the chemical processes in the animal organism, similar to that which occurs in the leaves of plants. By degrees the action becomes localized in a few pigment-cells, more sensitive to light than the surrounding tissue. The eye is here incipient At first it is merely capable of revealing differences of light and shade produced by bodies close at hand. Followed as the interception of the light is in almost all cases by the contact of the closely adjacent opaque body, sight in this condition becomes a kind of "anticipatory touch." The adjustment continues; a slight bulging out of the epidermis over the pigment-granules supervenes. A lens is incipient, and, through the operation of infinite adjustments, at length reaches the perfection that it displays in the hawk and the eagle. So of the other senses; they are special differentiations of a tissue which was originally vaguely sensitive all over.

With the development of the senses the adjustments between the organism and its environment gradually extend in *space*, a multiplication of experiences and a corresponding modification of conduct being the result. The adjustments also extend in *time*, covering continually greater intervals. Along with this extension in space and time, the adjustments also increase in speciality and complexity, passing through the various grades of brute life and prolonging themselves into the domain of reason. Very striking are Mr. Spencer's remarks regarding the influence of the sense of touch upon the development of intelligence. This is, so to say, the mother-tongue of all the senses, into which they must be translated to be of service to the organism. Hence its importance. The parrot is the most intelligent of birds, and its tactual power is also greatest. From this sense it gets knowledge unattainable by birds which cannot employ their feet as hands. The elephant is the most sagacious of quadrupeds—its tactual range and skill, and the consequent multiplication of experiences, which it owes to its wonderfully adaptable trunk, being the basis of its sagacity. Feline animals, for a similar cause, are more sagacious than hoofed animals—atonement being to some extent made, in the case of the horse, by the possession of sensitive prehensile lips. In the *Primates* the evolution of intellect and the evolution of tactual appendages go hand in hand. In the most intelligent anthropoid apes we find the tactual range and delicacy greatly augmented, new avenues of knowledge being thus opened to the animal. Man crowns the edifice here, not only in virtue of his own manipulatory power, but through the enormous extension of his range of experience, by the invention of instruments of precision, which serve as supplemental senses and supplemental limbs. The reciprocal action of these is finely described and illustrated. That chastened intellectual emotion to which I have referred in connection with Mr. Darwin is, I should say, not absent in Mr. Spencer. His illustrations possess at times exceeding vividness and force, and from his style on such occasions it is to be inferred that the ganglia of this apostle of the understanding are sometimes the seat of a nascent poetic thrill.

It is a fact of supreme importance that actions, the performance of which at first requires even painful effort and deliberation, may by habit be rendered automatic. Witness the slow learning of its letters by a child, and the subsequent facility of reading in a man, when each group of letters which forms a word is instantly and without effort fused to a single perception. Instance the billiard-player, whose muscles of hand and eye, when he reaches the perfection of his art, are unconsciously coordinated. Instance the musician, who by practice is enabled to fuse a multitude of arrangements, auditory, tactual, and muscular, into a process of automatic manipulation. Combining such facts with the doctrine of hereditary transmission, we reach a theory of instinct. A chick, after coming out of the egg, balances itself correctly, runs about, picks up food, thus showing that it possesses a power of directing its movements to definite ends. How did the chick learn this very complex co-ordination of eye, muscles, and beak? It has not been individually taught; its personal experience is *nil;* but it has the benefit of ancestral experience. In its inherited organization are registered all the powers which it displays at birth. So also as regards the instinct of the hive-bee, already referred to. The distance at which the

insects stand apart when they sweep their hemispheres and build their cells is "organically remembered." Man also carries with him the physical texture of his ancestry, as well as the inherited intellect bound up with it. The defects of intelligence during infancy and youth are probably less due to a lack of individual experience than to the fact that in early life the cerebral organization is still incomplete. The period necessary for completion varies with the race and with the individual. As a round shot outstrips a rifled one on quitting the muzzle of the gun, so the lower race in childhood may outstrip the higher. But the higher eventually overtakes the lower, and surpasses it in range. As regards individuals, we do not always find the precocity of youth prolonged to mental power in maturity, while the dulness of boyhood is sometimes strikingly contrasted with the intellectual energy of after years. Newton, when a boy, was weakly, and be showed no particular aptitude at school; but in his eighteenth year he went to Cambridge, and soon afterwards astonished his teachers by his power of dealing with geometrical problems. During his quiet youth his brain was slowly preparing itself to be the organ of those energies which he subsequently displayed.

By myriad blows (to use a Lucretian phrase) the image and superscription of the external world are stamped as states of consciousness upon the organism, the depth of the impression depending upon the number of the blows. When two or more phenomena occur in the environment invariably together, they are stamped to the same depth or to the same relief, and are indissolubly connected. And here we come to the threshold of a great question. Seeing that he could in no way rid himself of the consciousness of space and time, Kant assumed them to be necessary "forms of thought," the moulds and shapes into which our intuitions are thrown, belonging to ourselves solely and without objective existence. With unexpected power and success Mr. Spencer brings the hereditary experience theory, as he holds it, to bear upon this question. "If there exist certain external relations which are experienced by all organisms at all instants of their waking lives—relations which are absolutely constant and universal—there will be established answering internal relations that are absolutely constant and universal. Such relations we have in those of space and time. As the substratum of all other relations of the Non-Ego, they must be responded to by conceptions that are the substrata of all other relations in the Ego. Being the constant and infinitely repeated elements of thought, they must become the automatic elements of thought—the elements of thought which it is impossible to get rid of—the 'forms of intuition.'"

Throughout this application and extension of the "law of inseparable association," Mr. Spencer stands on totally different ground from Mr. John Stuart Mill, invoking the registered experiences of the race instead of the experiences of the individual. His overthrow of Mr. Mill's restriction of experience is, I think, complete. That restriction ignores the power of organizing experience furnished at the outset to each indi- vidual; it ignores the different degrees of this power possessed by different races and by different individuals of the same race. Were there not in the human brain a potency antecedent to all experience, a dog or cat ought to be as capable of education as a man. These predetermined internal relations are independent of the experiences of the individual. The human brain is the "organized register of infinitely numerous experiences received during the evolution of life, or rather during the evolution of that series of organisms through which the human organism has been reached. The effects of the most uniform and frequent of these experiences have been successively bequeathed, principal and interest, and have slowly mounted to that high intelligence which lies latent in the brain of the infant. Thus it happens that the European inherits from twenty to thirty cubic inches more of brain than the Papuan. Thus it happens that faculties, as of music, which scarcely exist in some inferior races, become congenital in superior ones. Thus it happens that out of savages unable to count up to the number of their fingers, and speaking a language containing only nouns and verbs, arise at length our Newtons and Shakespeares."

At the outset of this address it was stated that physical theories which lie beyond experience are derived by a process of abstraction from experience. It is instructive to note from this point of view the successive introduction of new conceptions. The idea of the attraction of gravitation was preceded by the observation of the attraction of iron by a magnet, and of light bodies by rubbed amber. The polarity of magnetism and electricity appealed to the senses; and thus became the substratum of the conception that atoms and molecules are endowed with definite, attractive, and repellant poles, by the play of which definite forms of crystalline architecture are produced. Thus molecular force becomes *structural*. It required no great boldness of thought to extend its play into organic nature, and to recognize in molecular force the agency by which both plants and animals are built up. In this way out of experience arise conceptions which are wholly ultra-experiential.

The *origination* of life is a point lightly touched upon, if at all, by Mr. Darwin and Mr. Spencer. Diminishing gradually the number of progenitors, Mr. Darwin comes at length to one "primordial form;" but he does not say, as far as I remember, how he supposes this form to have been introduced. He quotes with satisfaction the words of a celebrated author and divine who had "gradually learned to see that it is just as noble a conception of the Deity to believe He created a few original forms, capable of self-development into other and needful forms, as to believe that He required a fresh act of creation to supply" the voids caused by the action of His laws." What Mr. Darwin thinks of this view of the introduction of life I do not know. Whether he does or

does not introduce his "primordial form" by a creative act, I do not know. But the question will inevitably be asked, "How came the form there?" With regard to the diminution of the number of created forms, one does not see that much advantage is gained by it. The anthropomorphism, which it seemed the object of Mr. Darwin to set aside, is as firmly associated with the creation of a few forms as with the creation of a multitude. We need clearness and thoroughness here. Two courses, and two only, are possible. Either let us open our doors freely to the conception of creative acts, or, abandoning them, let us radically change our notions of matter. If we look at matter as pictured by Democritus, and as defined for generations in our scientific text-books, the absolute impossibility of any form of life coming out of it would be sufficient to render any other hypothesis preferable; but the definitions of matter given in our text-books were intended to cover its purely physical and mechanical properties. And taught as we have been to regard these definitions as complete, we naturally and rightly reject the monstrous notion that out of *such* matter any form of life could possibly arise. But are the definitions complete? Everything depends on the answer to be given to this question. Trace the line of life backwards, and see it approaching more and more to what we call the purely physical condition. We reach at length those organisms which I have compared to drops of oil suspended in a mixture of alcohol and water. We reach the *protogenes* of Haeckel, in which we have "a type distinguishable from a fragment of albumen only by its finely granular character." Can we pause here? We break a magnet and find two poles in each of its fragments. We continue the process of breaking, but however small the parts, each carries with it, though enfeebled, the polarity of the whole. And when we can break no longer, we prolong the intellectual vision to the polar molecules. Are we not urged to do *something* similar in the case of life? Is there not a temptation to close to some extent with Lucretius, when he affirms that "Nature is seen to do all things spontaneously of herself without the meddling of the gods"? or with Bruno, when he declares that matter is not "that mere empty *capacity* which philosophers have pictured her to be, but the universal mother who brings forth all things as the fruit of her own womb"? The questions here raised are inevitable. They are approaching us with accelerated speed, and it is not a matter of indifference whether they are introduced with reverence or irreverence. Abandoning all disguise, the confession that I feel bound to make before you is that I prolong the vision backward across the boundary of the experimental evidence, and discern in that matter, which we in our ignorance, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the promise and potency of every form and quality of life.

The "materialism" here enunciated may be different from what you suppose, and I therefore crave your gracious patience to the end. "The question of an external world," says Mr. J. S. Mill, "is the great battle-ground of metaphysics."

"Examination of Hamilton," p. 104.

Mr. Mill himself reduces external phenomena to "possibilities of sensation." Kant, as we have seen, made time and space "forms" of our own intuitions. Fichte, having first by the inexorable logic of his understanding proved himself to be a mere link in that chain of eternal causation which holds so rigidly in nature, violently broke the chain by making nature, and all that it inherits, an apparition of his own mind.

"Bestimmung des Menschen."

And it is by no means easy to combat such notions. For when I say I see you, and that I have not the least doubt about it, the reply is, that what I am really conscious of is an affection of my own retina. And if I urge that I can check my sight of you by touching you, the retort would be that I am equally transgressing the limits of fact; for what I am really conscious of is, not that you are there, but that the nerves of my hand have undergone a change. All we hear, and see, and touch, and taste, and smell, are, it would be urged, mere variations of our own condition, beyond which, even to the extent of a hair's breadth, we cannot go. That anything answering to our impressions exists outside of ourselves is not a *fact*, but an *inference*, to which all validity would be denied by an idealist like Berkeley, or by a sceptic like Hume. Mr. Spencer takes another line. With him, as with the uneducated man, there is no doubt or question as to the existence of an external world. But he differs from the uneducated, who think that the world really *is* what consciousness represents it to be. Our states of consciousness are mere *symbols* of an outside entity which produces them and determines the order of their succession, but the real nature of which we can never know.

In a paper, at once popular and profound, entitled "Recent Progress in the Theory of Vision," contained in the volume of lectures by Helmholtz, published by Longmans, this symbolism of our states of consciousness is also dwelt upon. The impressions of sense are the mere *signs* of external things. In this paper Helmholtz contends strongly against the view that the consciousness of space is inborn; and he evidently doubts the power of the chick to pick up grains of corn without some preliminary lesson. On this point, he says, further experiments are needed. Such experiments have been since made by Mr. Spalding, aided, I believe, in some of his observations by the accomplished and deeply lamented Lady Amberley; and they seem to prove conclusively that the chick does not need a single moment's tuition to teach it to stand, run, govern the muscles of its eyes, and peck. Helmholtz, how ever, is contending against the notion of pre-established harmony; and I

am not aware of his views as to the organization of experiences of race or breed.
In fact the whole process of evolution is the manifestation of a Power absolutely inscrutable to the intellect of man. As little in our day as in the days of Job can man by searching find this Power out. Considered fundamentally, it is by the operation of an insoluble mystery that life is evolved, species differentiated, and mind unfolded from their prepotent elements in the immeasurable past. There is, you will observe, no very rank materialism here.

The strength of the doctrine of evolution consists, not in an experimental demonstration (for the subject is hardly accessible to this mode of proof), but in its general harmony with the method of nature as hitherto known. From contrast, moreover, it derives enormous relative strength. On the one side we have a theory (if it could with any propriety be so called) derived, as were the theories referred to at the beginning of this address, not from the study of nature, but from the observation of men—a theory which converts the Power whose garment is seen in the visible universe into an Artificer, fashioned after the human model, and acting by broken efforts as man is seen to act. On the other side we have the conception that all we see around us, and all we feel within us—the phenomena of physical nature as well as those of the human mind—have their unsearchable roots in a cosmical life, if I dare apply the term, an infinitesimal span of which only is offered to the investigation of man. And even this span is only knowable in part. We can trace the development of a nervous system, and correlate with it the parallel phenomena of sensation and thought. We see with undoubting certainty that they go hand in hand. But we try to soar in a vacuum the moment we seek to comprehend the connection between them. An Archimedean fulcrum is here required which the human mind cannot command; and the effort to solve the problem, to borrow an illustration from an illustrious friend of mine, is like the effort of a man trying to lift himself by his own waistband. All that has been here said is to be taken in connection with this fundamental truth. When "nascent senses" are spoken of, when "the differentiation of a tissue at first vaguely sensitive all over" is spoken of, and when these processes are associated with "the modification of an organism by its environment," the same parallelism, without contact, or even approach to contact, is implied. There is no fusion possible between the two classes of facts—no motor energy in the intellect of man to carry it without logical rupture from the one to the other.

Further, the doctrine of evolution derives man, in his totality, from the interaction of organism and environment through countless ages past. The human understanding, for example—the faculty which Mr. Spencer has turned so skilfully round upon its own antecedents—is itself a result of the play between organism and environment through cosmic ranges of time. Never surely did prescription plead so irresistible a claim. But then it comes to pass that, over and above his understanding, there are many other things appertaining to man whose prescriptive rights are quite as strong as that of the understanding itself. It is a result, for example, of the play of organism and environment that sugar is sweet, and that aloes are bitter, that the smell of henbane differs from the perfume of a rose. Such facts of consciousness (for which, by the way, no adequate reason has ever yet been rendered) are quite as old as the understanding itself; and many other things can boast an equally ancient origin. Mr. Spencer at one place refers to that most powerful of passions—the amatory passion—as one which, when it first occurs, is antecedent to all relative experience whatever; and we may pass its claim as being at least as ancient and as valid as that of the understanding itself. Then there are such things woven into the texture of man as the feeling of awe, reverence, wonder—and not alone the sexual love just referred to, but the love of the beautiful, physical, and moral, in nature, poetry, and art. There is also that deep-set feeling which, since the earliest dawn of history, and probably for ages prior to all history, incorporated itself in the religions of the world. You who have escaped from these religions in the high-and-dry light of the understanding may deride them; but in so doing you deride accidents of form merely, and fail to touch the immovable basis of the religious sentiment in the emotional nature of man. To yield this sentiment reasonable satisfaction is the problem of problems at the present hour. And grotesque in relation to scientific culture as many of the religions of the world have been and are—dangerous, nay, destructive, to the dearest privileges of freemen as some of them undoubtedly have been, and would, if they could, be again—it will be wise to recognize them as the forms of force, mischievous, if permitted to intrude on the region of *knowledge*, over which it holds no command, but capable of being guided by liberal thought to noble issues in the region of *emotion*, which is its proper sphere. It is vain to oppose this force with a view to its extirpation. What we should oppose, to the death if necessary, is every attempt to found upon this elemental bias of man's nature a system which should exercise despotic sway over his intellect. I do not fear any such consummation. Science has already to some extent leavened the world, and it will leaven it more and more. I should look upon the mild light of science breaking in upon the minds of the youth of Ireland, and strengthening gradually to the perfect day, as a surer check to any intellectual or spiritual tyranny which might threaten this island, than the laws of princes or the swords of emperors. Where is the cause of fear? We fought and won our battle even in the Middle Ages : why should we doubt the issue of a conflict now?

The impregnable position of science may be described in a few words. All religious theories, schemes, and

systems, which embrace notions of cosmogony, or which otherwise reach into its domain, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it. Acting otherwise proved disastrous in the past, and it is simply fatuous to-day. Every system which would escape the fate of an organism too rigid to adjust itself to its environment, must be plastic to the extent that the growth of knowledge demands. When this truth has been thoroughly taken in, rigidity will be relaxed, exclusiveness diminished, things now deemed essential will be dropped, and elements now rejected will be assimilated. The lifting of the life is the essential point; and as long as dogmatism, fanaticism, and intolerance are kept out, various modes of leverage may be employed to raise life to a higher level. Science itself not unfrequently derives motive power from an ultra-scientific source. Whewell speaks of enthusiasm of temper as a hindrance to science; but he means the enthusiasm of weak heads. There is a strong and resolute enthusiasm in which science finds an ally; and it is to the lowering of this fire, rather than to a diminution of intellectual insight, that the lessening productiveness of men of science in their mature years is to be ascribed. Mr. Buckle sought to detach intellectual achievement from moral force. He gravely erred; for without moral force to whip it into action, the achievements of the intellect would be poor indeed.

It has been said that science divorces itself from literature. The statement, like so many others, arises from lack of knowledge. A glance at the less technical writings of its leaders—of its Helmholtz, its Huxley, and its Du Bois-Reymond—would show what breadth of literary culture they command. Where among modern writers can you find their superiors in clearness and vigour of literary style? Science desires no isolation, but freely combines with every effort towards the bettering of man's estate. Single-handed, and supported not by outward sympathy, but by inward force, it has built at least one great wing of the many-mansioned home which man in his totality demands. And if rough walls and protruding rafter-ends indicate that on one side the edifice is still incomplete, it is only by wise combination of the parts required with those already irrevocably built that we can hope for completeness. There is no necessary incongruity between what has been accomplished and what remains to be done. The moral glow of Socrates, which we all feel by ignition, has in it nothing incompatible with the physics of Anaxagoras which he so much scorned, but which he would hardly scorn to-day. And here I am reminded of one amongst us, hoary, but still strong, whose prophet-voice some thirty years ago, far more than any other of this age, unlocked whatever of life and nobleness lay latent in its most gifted minds—one fit to stand beside Socrates or the Maccabean Eleazer, and to dare and suffer all that they suffered and dared—fit, as he once said of Fichte, "to have been the teacher of the Stoa, and to have discoursed of beauty and virtue in the groves of Academe." With a capacity to grasp physical principles which his friend Goethe did not possess, and which even total lack of exercise has not been able to reduce to atrophy, it is the world's loss that he, in the vigour of his years, did not open his mind and sympathies to science, and make its conclusions a portion of his message to mankind. Marvellously endowed as he was—equally equipped on the side of the heart and of the understanding—he might have done much towards teaching us how to reconcile the claims of both, and to enable them in coming times to dwell together in unity of spirit and in the bond of peace.

And now the end is come. With more time, or greater strength and knowledge, what has been here said might have been better said, while worthy matters here omitted might have received fit expression. But there would have been no material deviation from the views set forth. As regards myself, they are not the growth of a day; and as regards you, I thought you ought to know the environment which, with or without your consent, is rapidly surrounding you, and in relation to which some adjustment on your part may be necessary. A hint of Hamlet's, however, teaches us all how the troubles of common life may be ended; and it is perfectly possible for you and me to purchase intellectual peace at the price of intellectual death. The world is not without refuges of this description; nor is it wanting in persons who seek their shelter and try to persuade others to do the same. I would exhort you to refuse such shelter, and to scorn such base repose—to accept, if the choice be forced upon you, commotion before stagnation, the leap of the torrent before the stillness of the swamp. In the one there is at all events life, and therefore hope; in the other, none. I have touched on debatable questions, and led you over dangerous ground—and this partly with the view of telling you, and through you the world, that as regards these questions science claims unrestricted right of search. It is not to the point to say that the views of Lucretius and Bruno, of Darwin and Spencer, may be wrong. Here I should agree with you, deeming it indeed certain that these views will undergo modification. But the point is, that, whether right or wrong, we claim the freedom to discuss them. The ground which they cover is scientific ground; and the right claimed is one made good through tribulation and anguish, inflicted and endured in darker times than ours, but resulting in the immortal victories which science has won for the human race. I would set forth equally the inexorable advance of man's understanding in the path of knowledge, and the unquenchable claims of his emotional nature which the understanding can never satisfy. The world embraces not only a Newton but a Shakespeare—not only a Boyle, but a Raphael—not only a Kant, but a Beethoven—not only a Darwin, but a Carlyle. Not in each of these, but in all, is human nature whole. They are not opposed, but supplementary—not mutually exclusive, but reconcilable. And if, still unsatisfied, the human mind, with the yearning of a pilgrim for his distant home, will

turn to the mystery from which it has emerged, seeking so to fashion it as to give unity to thought and faith, so long as this is done, not only without intolerance or bigotry of any kind, but with the enlightened recognition that ultimate fixity of conception is here unattainable, and that each succeeding age must be held free to fashion the mystery in accordance with its own needs—then, in opposition to all the restrictions of Materialism, I would affirm this to be a field for the noblest exercise of what, in contrast with the *knowing* faculties, may be called the *creative* faculties of man. Here, however, I must quit a theme too great for me to handle, but which will be handled by the loftiest minds ages after you and I, like streaks of morning cloud, shall have melted into the infinite azure of the past.

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Tribes, the greeting! to Herein I JNO., have fulfilled the commands of the supreme Smeythies, and in obedience can lie no offence. I speak of the past, and the characters I have drawn are near extinct. Should any one be led to exclaim—"I am here," my answer is—"Silence ! and none will know thee." To my friends I dedicate, what they will most esteem, the blot on page one, and the many more they can find.

1.

I, JNO., formerly of the U.K. of G.B.,—a Kingdom scarce a quarter of a century ago the base, or rather the apex, of an Empire which rose over and around it, triangular, precipitous, and vast,—I, JNO., formerly of the U.K. of G.B., but at this day of the tremendous tribe of Smeythies, whose demesne and hunting grounds lie around Taranaki, New Zealand.—I, JNO., of the tribe of Smeythies, which constitutes the most populous of the leash of Tribes that maintain that Island, do write.

I sit upon the last crumbling stones of that bridge,—erst the famous London Bridge. Pavement, footway, parapet, abutment, pillar, pier, all, all are gone. A rough, steep bank leads to the water on its northern site. The river, not as of old, sluggish, thick, and black, but lively, clear, and sparkling, flows unbroken o'er its foundations,—and I, on the few last mouldering stones, once lifting up the most heroic spot in Middlesex, survey the ruined and desolate city.

Ruin of Ruins! I behold—before, behind, around—of all man's works.

That threatening Tower, whose dark walls enclosed the sad mysteries of centuries, without a stone to mark its existence, is itself enclosed a mystery in Time. Supreme St. Paul's still rivals St. Peter's of Rome,—they are equally levelled, and traceless in the dust. One vestige alone remains—the brave golden tower of Westminster; retained by the invading chief as an oriflamme to denote the royal encampment, and left, in his sudden flight, intact. It burns, lofty and dazzling, over the waste to my left; and to subsequent generations will convey an idea of the wealthy nature of the city, of which it will be esteemed the least valuable relic, when neotoric brick and mortar are extinguished.

I am here compelled by Fate.

The Soothsayer (of whom hereafter) of my tribe, consulting his oracles (of which hereafter) found, that four ages ago, a strange prophet from the European Continent, lost and inspired amidst the wreck and solitude of Palmyra, foretold that one would sit upon the banks of the rivers of their renowned cities and write their fall; that, three ages ago, a young poet of this Kingdom, musing in the inspiration of his teens, re-echoed the same truth; and that, two ages ago, a prophet of this desert, prophesying with his predecessor's prophecy, named our race to produce the appointed one, and his place the appointed city.

The tribe responded to the Soothsayer, and a man was sought for fit to accomplish the prophecy. I was chosen. Because, firstly, I was the earliest that fled this devoted metropolis, on the presage of woe; secondly, the latest months of my life here were spent, alas! unhappily, in remarking much of the manners and characteristics of the nation which peopled this desolation.

We print no books in our tribe (of which hereafter), and this will be the only memento of the direful calamity that swept from the Caspian Sea to the Galway Coast.

I am thus original, having no contemporaneous writers. As for my language, it was once conventional, now it is classic. Its pronunciation is already incomprehensible to most of our tribe. Those who can, dare not speak it. My own name is as dread as that of Demogorgon of yore. The articulation of it is *Jinno*.

2.

I WAS born in one of the sweetest counties of this Island, and the village in which my parents lived might have been considered embosomed in Paradise, had it not been for high rents, and the imposition of taxes.

My father and forefathers throve exceedingly in this village; but when I was fifteen years of age, a war arose between two foreign nations, many hundreds of miles distant across the sea. No one could understand how it was, yet it did happen, that this war smote our village, and the inhabitants suffered as much as if they had been foraged by contending armies. Trade was blasted in every branch. My father's business was reduced, so that it brought him in barely sufficient to keep his family and pay the rent. He was thus a loser every year exactly the amount of taxes,—these things, of a truth, did abound and increase, but in their life they brought forth nought but death.

My father's estate wasted year by year,—so did his form,—and when I was twenty-one years of age he died, without cough, spit, fever, tumour, or fracture. Physicians compounded an epithet for his complaint, but vulgarly it was spoken of as a broken heart. People sneered at the circumstance. For cholera and influenza they had a great deal of respect; of this malady, however, they had no fear, therefore they sneered. Nevertheless, it did prove infectious, as my mother died with similar symptoms, when they were placing my father's body in a coffin.

I did not then know, but I have since observed, that, of a certainty, in spite of our mocking neighbours, this malady—a "broken heart"—*is* contagious; and, further, hath this peculiarity—it never comes to men from their fellow beings, nor from aught else save things inanimate or imaginative, as from loss of their money or goods, and from disappointment in their expectations and desires; and to women it never comes in such fashion, but from disappointment or cruelty in regard to men alone.

My thoughts had been much disturbed about that time, by the teachings of a class of men who affirmed the non-existence of a soul, a God, or an hereafter. The irrecoverable loss of my parents crushed me into the very dust; and these men had for me no consolation—no, nor sympathy. For days I was as a worm in a corpse. At the burial—in one hour, in one grave—of those who had given me life, I covered myself with my mourning cloak, nor dared to look on the face of heaven above, nor on the face of man around me. I stood in darkness at the head of the grave. I heard the burial service. I heard sobs. There was then silence. This was broken by the sound of earth rudely shovelled upon the coffins beneath. The sound was as of a voice—a parting voice—a parting voice from the dead. I dropped my cloak, and beheld the coffins—rather, say my parents—wrapt from my sight for ever by the relentless soil.

Instinctively I raised my eyes. Over me bent the graceful branches of a tree. Spring had stepped forth a little by that day, and the leaves were bursting forth, innumerable, bright, and beautiful, forming a veil of green. As if a fountain had opened in my heart, gushed forth the thought :—"As these come forth from death, so will come forth the soul. The Power that brings them forth, will also bring forth the soul. That Power, omnipotent and beneficent, creative and eternal, is what men name God. Where God lives there also is the abode of the soul; that is, not in Time alone. To be in Time, He must have been before, and, therefore, must be hereafter."

I write this that it may be known that our tribe are informed and convinced, by observations of nature like this, of the existence of a God and his goodness. They would be astonished at a man asking for any other proof of these matters. But the men I before spoke of, laughed at my exclamation by the grave side. They would be satisfied of nothing but by many words; in this, however, many words would not satisfy them.

The goods and property of my father, when sold, left me in possession of two hundred golden pieces. He, besides, having been a freeman of the village, which had formerly been a town, I inherited from him a Vote.

A Vote, I may say, was once the right, but had declined into the privilege, of raising a hand in the election of a person, sent by the village, to sit or not to sit, to speak or not to speak, his own mind, or some one else's mind,—as he chose,—in the Parliament of the land; which Parliament corresponded with the meeting of the chiefs of our tribes, with this difference,—that the chiefs consult only on matters affecting the Nation of Tribes, and cannot dictate aught as to the internal affairs of a tribe, and they must represent what their tribe has instructed them upon, and only such things.

This Vote was understood to belong to the man to whom it belonged. In my father's case, however, it was always the property of his best customer. In later years, when, from a vacillating mind, he was behind with his rent, the lord of the estate desired, and commanded him once or twice, to give it in a different way to what he had done before. This inconsistency my father always evaded, by reluctantly paying the rent that was due.

This Vote, then, was a valuable portion of my patrimony, since it always secured a good customer,—in fact, a rivalry of customers,—and I regretted to part with it without any return; for I had resolved to retrieve a part of that fortune in London, which my father had lost in the country, and it was of no value to me out of my native village.

3.

THE idea that tyrannized over my mind, for some weeks before my departure, was the immense distance to London. I conceived that the journey had to be, as it were, to the extremity of the globe. To my surprise, the flying carriage, in which I was transported, took me there, after breakfast, in time for dinner. I seemed sped by enchantment; for, oh! indeed, space, time, place, men, manners, power, numbers, wealth, no longer cohered in my bewildered brain, whilst I partook of a public dinner, bestowed by myself on my own behalf, in a chophouse, honoured by the presence of two hundred people that had never seen me before.

Arrived in this traditionary metropolis, I thought to invest my money and my talents, in some way that should be profitable. My first object was to obtain lodgings—respectable and cheap. I had heard of the extortion practised at hotels, and I ventured not within their flattering precincts. Then, as I was a stranger, there was great danger of my falling into a bad neighbourhood. I heard, however, that there were large archiepiscopal possessions in one part of the city. I was certain that all houses within their limits would be orderly, if not, indeed, religious. "Happy," thought I, "is the kingdom that has a National Church."

No time was lost by me in taking apartments in one of the humblest streets of the sacred locality. To my dismay, I soon found that my neighbours, before, behind, and on both sides, and my fellow-tenants above and below me, were thieves and lax characters of both sexes. It was evident, in a few hours, that unless I devoted my property and services to them, my life would be in jeopardy.

On the night after my arrival, whilst indulging in a pipe, pot of porter, and a pleasant performance, in one of the great Music Saloons common to the metropolis,—huge, fanciful buildings these were, as lofty as the tallest of our forest trees, and as spacious as the area in which our Witenagemot meets,—I made the friendship of a man who knew everybody and every place in London, and who promised soon to show me how to dispose of my money and talents to advantage.

He first made me change my lodgings to a better street; and, as my old landlord refused to take less than a month's notice for the vacating of my rooms, I paid the money forward for that time; and, that it might not be quite lost, my Friend resolved to occupy them himself for that time.

My Friend soon introduced me to several public places, where fortunes were made. All his companions had, or said they had, made their fortunes; and he soon initiated me into the processes by which this was effected.

These were chiefly games and speculations. One favourite game was called Billiards, which was played on a large oblong table, at the corners and sides of which were small pockets; and the skill consisted in projecting balls into those, by blows from the end of a stick. Another game was Skittles, in which nine pieces of wood were set up, and a large bowl was thrown at them from a distance. A similar method was pursued in a game by two men, with their closed hands instead of bowls, which they hurled at each other's face as rapidly and forcibly as possible. Speed in horses, (which was a royal game,) and patronised by many of their monarchs; men running in competition, and pulling in light boats, were also games in high estimation. But the one most popular, was that played by fifty-two pieces of cards, in four sets, grotesquely characterized. There were many ways of playing with these, but a great advantage consisted in commencing near the hour of midnight, and after plentiful libations of spirituous liquors.

I was very successful in my skill and speculations,—especially in the last mentioned game. I won, not only when I won, but when I lost. To lose twenty golden pieces, was generally equivalent to winning thirty. The system was to place the winnings in one pocket, and pay the losings out of another. All these arts are now obsolete, or I might have had more to say respecting them.

Whilst engaged in these undertakings, I chanced to meet with one of the servants of the Religious Chief, who was endowed with the large ecclesiastical possessions that I have before mentioned. He was a gentle, pious, and earnest man. He severely condemned the manner in which I accumulated money, although it was clone on his master's estate, and his master's income, indirectly, but in the largest part, arose from the countenance given to the practices by which I was enriched. He bade me look into the Holy Book, which my father and mother had greatly loved, and which is the light and rule of our Tribes. I was confounded, and heart-stricken. My Friend laughed at me. The good man talked of restitution: my Friend said the restitution should be to himself, since I had earned my gains through him. The next day I lightened my heart and purse by following their joint advice, and in so doing I found myself nearly a beggar.

On the evening of the second day after making restitution, I was sent for to the bedside of my Friend, who lay ill of a fever.

It had been a drizzling, murky, muddy day. The cold and damp entered into one's very bones, and into the very marrow within them. Nevertheless, the obscure street in which my Friend lived was crowded and noisy, so as I had never previously seen it. I met the good man coming from my Friend's rooms; and, before asking how he was, or remarking on the weather, I inquired the reason of the strange commotion. He looked at me severely, as he passed by, and answered, "This is the fruit of your wicked industry." I thought he joked seriously.

I now observed that all the people were drunk—fighting, swearing, lying in the gutters, torturing catgut,

and anything but thankful. The house door was open; and, as I ascended the stairs, I stumbled over prostrate men and women, intoxicated and demented; and scattered about were many golden pieces.

A great statesman had given a new explication of another great statesman's policy; using his method, I may say, that all around me was—fiddle and fuddle.

Entering the room, I beheld—the landlord senseless in a corner; the woman-nurse, who had to attend my Friend, gin-struck by the bedside; and my Friend on the bed delirious.

Thus had it happened. My Friend, on receiving my money, had bought drink and drunk it assiduously, till brain fever seized him. The symptoms were known to the neighbourhood as well as the physician. When he was brought home, all the people of the street,—men, women, and boys,—rushed upon him, ransacked his garments, ravished the residue of his gold, and spent it as he had spent it. I was now in the midst of their wild carnival.

4.

I SAT by the head of my Friend.

His mutterings were low, but the subjects were terrible. It seemed as if fiends had seized his soul within the body, and were tormenting it. I laid my hand upon his head: it was throbbing and fiery. My hand soothed him: he heaved a slight sigh, and his mutterings became milder. I removed my hand: then his torments grew more intense than before. I replaced my hand : his anguish subsided again. My hand grew hot: his groans increased. I removed it, to cool it—the simple removal effected this. I replaced it: he was quieted once more. My hand was shortly in a fresh glow. I repeated the action. Accidentally I laid hold of one of his hands : it was like burning coal, and I would have relinquished it had I not noticed that, whilst I held his hand (my other hand resting on his head) the respite from his pain was more marked than before. An electrical and rather unpleasant feeling ran up my arms whilst in this position; but it brought such apparent relief to the sufferer, that I sat fixed in the chair, steadfastly holding his hand in mine, and removing and reapplying my other hand to his head.

Now, it was a pallet bedstead; and as I, to cool my hand, removed it from my Friend's head, from time to time, it went towards the corner of the room in which the bedstead was placed. I was so much absorbed in contemplating his condition, whilst the operation ameliorated his madness, that the motion of my hand, in removing and returning it to his head, became regular and mechanical.

Slowly, slowly,—down, and down, and down,—like ebbing waters on a flat beach, declined the delirium, till my Friend's respiration was soft, low, and un-troubled. Still did I continue the operation. His breathings became lighter and more prolonged. I was engaged perhaps half an hour, when a little sigh arose from him, which pierced me like an arrow of lightning, and the transformation of his face caused me to start in agony.

He was dead. Dead! I knew by the evidence of my senses. Dead! by the conviction of my heart,—though I had never seen the metamorphosis of life into death before.

I sat awe-stricken and paralyzed.

A sigh, from the corner whither I had directed my hand in its motions, aroused me. The sigh was as the echo of the last I had heard from my Friend. Was it from him? I looked steadfastly at his face. No! A new power was enthroned there, changing with swift potency the empire of intelligence that lately was supreme on every lineament, though shaken by the invasion of madness.

It now occurred to me,—less from memory than from intuition,—that, on every passage of my hand, an Influence seemed to have been gathering in that corner, which gave to my fingers on approaching an acute and indescribable sensation. I reached out my hand into the corner. The sensation seized on my fingers, and thrilled up to my shoulder. My attention was concentrated on this phenomenon; and on withdrawing my hand, the Influence came with it.

There was a footstep on the stairs. I turned round just as the good man came in at the door. He gave one glance at the dead body, clasped his hands, looked up to heaven, and murmured a prayer. "What shall we do?" said I, when he had finished. "Leave the last mournful rites to me," he replied. "I may see you again." By the tone of his voice he bade me be gone, as one who might desecrate the death-bed.

I left the house and made towards my lodgings. The good man's words, or rather the inference therefrom, had shaken my soul, and I was half way on my road before I was aware that the sensation in my hand continued. I was then conscious of the presence of the Influence. My hand tingled strangely and somewhat painfully. From its natural position, the Influence appeared compressed between the palm of my hand and my body, so that I walked awkwardly. I twisted my hand, that the palm might be from me. I then walked with ease, but the Influence still accompanied me, as I knew by the tingling feeling, living unweakened, and thrilling to my very brain.

5.

THE clock struck twelve when I entered my chamber. All was still—more so than ever I had noticed before—and the stillness inspired me with a fear, which was as the presage of some momentous event.

I threw myself into a chair, exhausted by what I had undergone, and appalled by the superincumbent hour.

A sigh, uttered at my side, startled me. The selfsame sigh it was which came from the bed-head of my departed Friend, but expressing more pain.

"Whatever can this mystery be?" I murmured to myself. The sigh was repeated. "Good heavens," I exclaimed, "is there a presence here besides mine own?" Again there came a sigh. I turned in terror to the direction of the sound. "Art thou anything or nothing?" I demanded in fearful accents. The sigh arose once more, but with more agonizing emphasis. "If aught more than my wandering fancy," I shrieked in anguish, "speak, if thou hast the power of speech, and cease to sting my brain to madness." Another sigh came forth, as of one who relieves himself from the martrydom of pain ere he frames his tongue for utterance. "What art thou?" I cried aloud, following up my last words, and the answering sigh by instinctive logic.

"The Spirit of thy Friend."

The words were pronounced, not as of mortal speech, but as the syllabling of silence itself.

I sank into my chair, and was held in a trance of horror for some time; yet, in the trance, a course of reasoning ran through my brain, so that when I recovered, I spoke as a partner in the mysterious converse.

"And wherefore art thou here?" I asked.

"It is thine own doing," came the reply, firmer and more distinct.

"My doing," I cried: "let me know further."

6.

"BETTER hadst thou stay thy curiosity," said the Influence, "unless thou wilt use, for thy salvation, the secret that accident has enabled thee to explore. Consider, then, ere thou desirest to know how the present has come to pass."

For some minutes I pondered in silence over these strange words. I had been given to understand by those versed in the medley, muggy craft, that spirits never came to man in any form but for his destruction. I reckoned somewhat like Cæsar on the banks of the Rubicon, and then replied—"I am resolved. Let me know all. Be my unriddler, guide, saviour,—what thou wilt."

"Gladly," answered the Mystic Voice, in a louder and more musical note; "for the greatest happiness a spirit can attain, after its departure from the earthly body, is to serve those it has injured on earth. It has been the lot of my predecessors, in past ages, to effect this service only by faint communications,—which were, indeed, but hints and intimations, abrupt and inconsequential,—that bewildered mortals instead of enlightening them, inasmuch as they all have been un-equal to the task of avoiding the dangers so vaguely indicated. Thou,—fortunate man!—hast unravelled a mystery, of which neither the subtleties of art or science could unweave the first threads. There have been great pretensions of the power of will over will, aided by certain formal passes of the limbs. These, though touching on the truth, have been only blind guesses in the dark; but thou, by virtue of the great moving power of the age, which, in trivial matters, men call Chance; by the intuitions of thy unrecognised thought, concentrated upon me in mortality's last hour; conjoined with the electric forces of thy body, hast withdrawn my soul from its fleshly tabernacle, ere the messengers from the spiritual world came for its removal, and taken it under the care and potency of thy will, in whose custody it now is."

"Under the pain of a heavier penalty in eternity," continued the Vocal Phantasm, "that I may atone for the wrongs I have done thee on earth, I say to thee, that, through me, thou canst compel my mighty Master and Tormentor to serve thee in unveiling the rank imperfections and scanty excellencies of mankind. He will have no dominion over thee, unless, in some compliant and unhappy moment, thou voluntarily resignest thyself over to him. Therefore, if thou wilt have him as thy servant, to open the minds of men to thine eye, and show thee how bootless a task it is for thee to place thyself under their command for hire or buffetings,—speak, and it shall be done.

I reviewed my position, and was in deep thought for ten minutes. I had now been in this City of the Waste for some months : the money I had brought to invest was nearly all squandered: I had never yet had an opportunity of engaging my abilities for the advantage of another man, as I intended honestly, and, as I hoped, with some profit to myself. "If all avocations," I reasoned, "should bear in them a tinge of that viciousness

which those have that my Friend, in his life, introduced me to, the end may be that in a few months, after severe labour, I shall find myself utterly penniless, and still more unhappy. If, instead, I accept of the Spirit's offer, I shall know where honesty dwells, and there bestow myself: or, if it should not have a local habitation, as well as a name, as his words malevolently insinuate, I will better know what to do."

I said resolutely to the Inapparent Presence, "Thy kindness has possessed me; send thy master."

There was a rustling in the air for the space of half a minute: a faint sound followed as of one tortured, which died away; then a harsh voice cried—"What is thy will?"

"Who art thou?" I demanded.

"ARCHIMAGO,—the Lord and Ruler of the chief horde of Spirits in the earth and out of it," replied the Stern Utterance.

"I wish—nay, I command thee, to reveal to me thy manifold workings amidst the people of my nation."

"I obey. There is but one condition"—

"I agree to no condition."

"Yet it still exists, and will enforce itself," bitterly answered the Arch Spirit.

"Name it, then."

"I come," said It, "at all times when thou commandest; also, whether thou desirest me or not; but, should I call to thee three times, and thou dost not answer, thy power over me will depart for ever; or, shouldst thou answer any voice as mine but my own, thou destroyest thine own charm."

"I am content," I replied; "attend me as I leave this house to-morrow morning."

There came no response; and, persuaded that the Imperial Spectre had departed, I rung the bell, took my supper, went to bed and slept soundly.

7.

AFTER breakfast, I waited for the Demon. It did not come; so, when an hour had elapsed, I went out for a walk.

A gentleman nudged my elbow as I descended the step. I looked at him enquiringly as to the rudeness, He smiled, and his smile conveyed more meaning than an hour's explanation.

He was in height five feet four inches, of spare build, and uncomely to look upon, appearing more a satyr than a man. His legs were like half-strung bows, but this conventional deformity was concealed by exquisitely moulded trousers,—nevertheless, he walked ungainly. The other parts of his body were proportioned to his legs. Still, his face was striking. He had a lofty brow, from which his straight hair was carefully brushed. His cheeks were hollow, and shot down sharp to his chin. His eyes were small, brown, and sunken. His nose was sharp, and pointed. He wore a little beard, and a moustache which was combed straight down, as if to hide an irregular set of teeth.

It was ARCHIMAGO; and without any parley of "Fine day,"—"How d'ye do?"—"How are you?"—"Where do you come from?"—"Where are you going?"— which formed the great apologies of intercourse in this great nation,—we walked together, conversing on the topics of the day, like acquaintances of eighteen months.

On a subsequent occasion, I asked my Familiar why he took this uncouth form, when he was able to adorn himself with all the qualities of human beauty. "Because it suits many particular purposes best," confided he. "I am not envied in such guise, and thus save myself the trouble of frustrating passions. I shock every one at first sight: then, my figure is looked at,—the clothes, you see, neat and fashionably made, divert and please the taste—pity follows: then, my features are observed, and my brow bespeaks great intelligence—it ensures respect. You will notice, however, that I never presume to be learned; so that my language never raises the fears which a display of intellect always creates, in circles of business, piety, and pleasure. I never rise above common-place. But I never fail to deliver my words slow and circumstantially, and the effort causes people to listen attentively. They hear their own fungi ideas repeated. This does not disappoint them. They look on my brow; believe the divinity of intelligence has delivered an oracle; admire it in the limping, emphatic delivery; admire themselves who have conceived the same meagre thoughts, and admire me for teaching them to admire. This present form of mine suits one class of classes, and I need only assume another—for those intent on pleasure—to include the whole range of humanity, on these morsels of earth called countries.

8.

AFTER walking for a time in easy conversation, which comes without thought and passes without impression, Archimago said—"Let us not neglect business. Step in here."

We entered a large reading room. Men of all classes and ages, were rushing in and perusing the newspapers that lay about, as eagerly, hurriedly, and devouringly as I have seen them at their mid-day meals, and then off again.

"This is the most interesting journal," said Archimago. "It is the last number of the History of the Country."

I turned, and saw that he had spread upon a table before him, that day's impression of a leading newspaper. I smiled. One person said, "queer fish;" another, "lunatic;" a third, "senseless factionist;" a fourth, "wretched slanderer;" and a fifth, "brazen panegyrist." I smiled again, and said—

"If you are in earnest, you must mean to say the History of the World, for it contains a register of the events that are daily happening in every corner of the earth."

"Not so," replied Archimago. "It is only the writer's or the editor's representation of those events. He does not give the true history of other countries, but his representation of them do form a paragraph in the history of his own. You see in that," pointing to a page, "the mind that perverts. In those who read," sweeping his arm round, as if to include those within the room and the whole kingdom without, "you see the minds that accept the perversion—thence flows our history."

"Nay, nay," I observed, forgetting that I was talking with one who was an Imperator of the human mind; "you are calumniating the greatest force of civilization, and would put down (for as I would infer from your words) the communication of knowledge."

"You are wrong," said he, in a whisper. "I love it—it is my work. Consider a moment. This is a newspaper. Now look at the news. Here, a fire has taken place; there, a house has fallen down; yonder, a ship has been launched; and, in that corner, a bridge has been built. Each has five lines allotted to it. But here a Vicegerent has given our national flag to shield criminal foreigners; *their* country's laws, however, will not recognise the illegal act, but seize upon the offenders. Oh, ho! how soon the dogs of war are slipt. We have bombarded a town for it, and an innocent human being has perished for every fretful hair of the consul. There is blood enough spilt to recrimson the standards of both army and navy—at a friend's expense, let us say, and quite *apropos*—inasmuch as this high-blown official pretends to be a teacher of political economy. Look at the remarks upon this transaction—column after column. Refer to previous papers, and see how inexhaustible has been the theme. Every note of the cornupeon of national vanity has been touched; and the hearers thrill to the sounds of honour, cupidity, valour, hatred, the might of bomb-shells, the interests of commerce, and progress of Christianity. Like our fashionable music, the true tune is lost, in the variations that envelop and overwhelm it. . . . . . . One might suppose it was the narrative of another siege of Troy, but this is not Homer's strain. . . . . .The Chinese, you may be aware, had the first newspapers, and they whipped the man who added any remarks of his own in printing news.

"That is not all. Behold, a squadron of ours has sailed up an oriental gulf, to a city with which we are not at war. Our Representative there knew of their coming, but the people did not. I was there with my beloved disciple, and he did not inform them; nay, he told them—not the truth. The ships came in sight, he sailed out to them, and then,—then, they attacked the ill-fated city. Ha! ha! how I revelled—fire and destruction—ravishing and flames,—and streams of blood. What news find you there of this? Not five lines, I warrant you. The printer's ink has blotted out the event."

"But," said I, "that was—"

"Your *but*," he answered, with a cutting sneer, must go out of the world, for practices like these embrace the whole of it."

"Then how does this happen?" I exclaimed.

"Your newspapers are part of your government," the Spirit answered.

"That is true," said I, "and 'twere better—"

"Nothing can be better for me," he sharply replied.

"Don't let us discuss, or 'twill be Archimago against Archimago. To business. Here are news of men for places and places for men, which course will you take?"

9.

I WAS about to fix upon a Junior Clerkship, that was wanted by an eminent firm, when Archimago stopped me.

"Has the tuition you received under your late Friend," said ho, "given you so little wis—knowledge. Who wins aught worth receiving, but those who play for high stakes?"

"But when I place no stakes."

"So much the better, and superlative—best if you have none to lose; then, play higher still. Thereby you take fortune by the girdle. Winnings are all gain. And if you have a bad hand, or throw the lowest dice, your

genius will develop itself in getting out of the difficulty. Wit against numbers, day or night. Look here! try for this appointment."

"Oh, but see the qualifications required," said I, blushing and astonished at the advertisement he pointed out. "The greatest scholar of the day, would tremble before submitting himself for it."

"So much the easier for you to get it, who have not the qualifications."

"Nay, have them, or have them not," I answered, "it would require a great amount of what is called *influence* to get it."

"Don't deceive yourself. You are at this moment at that point from which all men rise. You are without friends or money, and you will beat them all."

I resisted his entreaties; but so far changed my mind, that I resolved to apply for the following:—

"SENIOR CLERK.—Wanted, a Senior Clerk in a merchant's office, to attend to the warehouse and stock books. Also, a Posting and Collecting Clerk, and a smart Youth. Apply by letter only, to———"

"Let me write a letter at once."

"Nonsense!" exclaimed my Companion. "Don't lay yourself a voluntary victim on the altar of———well, say, mine. There is no time to lose. Your letter would answer your poor thoughts only too well. Truth is ascertained by personal enquiry. Let us enquire."

We were shortly at the address given in the advertisement. Archimago led the way into an office, where there were several youths, from twelve to seventeen years of ago; and at a high stool sat a sad, shabbily-clad man of forty years of age.

"Governor in?" asked Archimago of the man.

"No. Will be—in half an hour," answered he, with a sigh and a wheezle.

We waited a while, and the two were intimate in thirty words. Their conversation was often interrupted by the boys bullying, and laughing at the man. They failed not, also, to interrupt my attention and silence. Believing me to be an applicant for a situation, they were assiduous in pleasant mimickry and mockery of my dress, my looks, and my attitude. It all came out in five minutes. The man had entered the situation, with a good character and constitution, a year before, as senior clerk. He commenced with three pounds a week, and now had nothing—neither wages, character, nor constitution.

How was it? Oh, shortly after entering on his engagement, his master had given him five pounds for expenses, with a memorandum-book in which to enter them in. He spent the money and returned the book. His master laid it aside, without looking at it. "A few days after, he asks me what I had done with *fifty* pounds. He hands me the book. There, surely enough, was a nought added to the five. My words were of no avail. I must make up the money. I worked for nothing, till it was made up. He then told me, that if I troubled him for more wages than he chose to give me, which was ten shillings a week, or sought to leave, he would expose the fraud, which my repayment had committed me to. It's gone too far now. I am ruined so thoroughly—go look at my home—but no. He sees that he can do no worse with me, that I am desperate, so I have struck. I leave in a week. He advertises for *letters*—yes, he knows I'll tell any one coming here, of the hell he prepares for talents and honesty, to render them his cheap slaves. Ha!—'Posting and Collecting Clerk, and smart Youth'—Faith! no more are needed here. Look round, and you will see their numbers; you will see their prime duties too. When a head man is out of favour, there's no humiliation like that wrought by the insults of the petty vagabonds beneath him. That vile taskmaster of mine knows it, and makes it part of his policy."

As we left, Archimago laughed low and mockingly.

10.

I DID not speak to Archimago, as we retraced our steps to the City. I was occupied with moody reflections, and when he would have disturbed me with remarks on the different humours of passers-by, I bade him begone.

No musical twang, obnoxious perfume, or shaking of the elements, accompanied his disappearance; but he was lost in an instant, as any man is lost, behind a corner.

Half-a-dozen solitary hours, convinced me of the fact, that brooding upon an unhappy topic will not improve it, but will vastly deteriorate oneself. And, about ten o'clock in the evening, I was only too glad to have some one to call upon, though he was of spiritual essence. So, by mystic signs and words, which a few lingering seeds of civilisation in our tribes makes it dangerous for me to reveal, I called forth the Arch-Demon.

My first enquiry was, whether he could show me something that could bid dull care avaunt.

"It is impossible," he replied. "The existence of good would grieve you, from the sad circumstances with which it is surrounded. The devotees of mirth will shock you, in the exposure that I must make, of their falseness and vanity. Nevertheless, this will prove the best relaxation you can find. Come,—it is exactly the hour at which a notable subject of mine invites a score of people he does not know, and three score whom he

hates, to gain a reputation, that none will give him credit for, till some scribe shall indite lines upon his decease; let us away, to the Eleusinian mysteries."

It was a large house, and every room was lighted up and utilised. There were near as many servants as guests. The large doors in front were thrown open. Carriages filled the whole street, and the entrance of their occupants, gave the scene the appearance of a fancy ball.

Delight was painted on every face. When the host, the hostess, and their friends, greeted each other, their ecstasy was as unbounded as it may be expected to be, when they meet in the bowers of Elysium, bathed in airs of unalloyed and perpetual bliss.

The host appeared to recognise my Familiar as a very intimate friend: and I was cordially received as his acquaintance.

We were introduced into the principal saloon, which, to my eyes, was gorgeous in the extreme, and fitted for the presence of Venus and the Graces. They seemed, indeed, coming now to consecrate the place, with brilliancy, beauty, and smiles.

I turned—and the Spirit was gone.

"Oh, ho!" thought I, "you are deceived for once. Here is a company, where your art finds no disciples. All is genial and innocent hilarity."

Shortly, my attention was attracted by three persons, near the centre of the room. One was a handsome girl, of eighteen years of age. Beside her, a young man, a couple of years older,—who had attended her the whole of the evening, wrapt up in her sweet presence;—was drooping his head abashed, whilst a gentleman, apparently ten years his senior, talked very volubly to the lady, and laughed, and rolled his eyes singularly. The girl was extremely delighted, and quite neglected her lover, for this new acquaintance.

This gentleman soon left them, and passed from one group to another, talking, laughing, and rolling his eyes ceaselessly. He was a great favourite with all, and I was anxious to converse with him, that I might be amused as well as others, and try to discover the method by which he pleased so universally. At last he came up to me.

"A very merry party," said he.

"Indeed it is," I answered, "and you appear the merriest of them all, and the very genius of merriment."

He looked at me with a laughing face, and our eyes met. It was a flash, and a recognition.

ARCHIMAGO stood before me, in his second character.

He was rather stouter than he had previously appeared; but in height, and in the shape of his limbs, he was exactly the same. The contour of his legs, by reason of his tailor's device, was impalpable to the casual glance; I saw at once, however, that he was not envied by the dancers—although, the ladies did desire him for a partner. His dress was as expensive as any in the room; but it was so modest, as to be outrivalled by nearly all, at half the cost. The great change was in his lustiness, complexion, and manner. He was ruddy, with sandy hair,—in a few artificial top curls,—and wore bushy whiskers and moustache, reddish and thick. His cheeks were filled up. His eyes were slightly protuberant, and of a hazel colour. The explanation he had given me of his former character—which I denominate *Tenebrosa*, for good reasons,—caused me to examine him, for myself, in the present one,—which I call *Sanguinosa*, for the same.

He laughed at everything that was said by others, or by himself. To my mind, he laughed by the force of his stomach; nevertheless, it had a marvellous effect. He, simultaneously, rolled his eyes significantly on those he talked with, and the look and the laugh together, caused all around, and the laugh itself those within hearing (and it reached every corner) to join in the laugh's melodious ring-a-ding-dong-ding. He sounded the key-note, and immediately Comus's psalmody commenced.

The jokes that flitted about,—engendered in the bogs of dulness,—would not bear repetition, much less printing. They were the will-o'-the-wisps, the signal lamps, the summer lightnings, the coruscations, tickling straws, and wether-bells, of the general conversation; and Sanguinosa did not produce even emulation in his speech. All laughed,—laughed at their own laughter,—and rejoiced in their individual greatness, and in him who bestowed it on them. The young lady whispered to her lover, "what a delightful fellow." The lover, without jealousy for once, said he was, and wished him to come back again—she in heart wished the same. So thought and wished every one.

Every one—except one. This, was a young gentleman, well formed, magnificently dressed, fluent of speech, and witty withal. All these availed him nothing. The gentlemen avoided him as dangerous; and the ladies were cool with him, for he was engaged, He came, lingered lax and loveless, and vanished early, like an apparition.

"Look at that Diana in white, and that Vestal in blue," whispered Archimago. "Hark, how they talk to that Venus, and praise her flame-coloured silk. She leaves them now, and they say to each other, 'How hideous she looks in that dress.'—Ha! ha! ha!—My laugh attracts them : they laugh, too, as if they loved every one."

"Venus, herself, has told them she hates Adonis. The truth is, Adonis slighted her at the last ball. See! she

has met him; he has just been jilted by Cleopatra there with the pearls. How delighted he is to meet Venus; she nestles up to him, and seems almost inclined to fondle.—Ha! ha! ha!—They hear me, and both laugh. How sincerely and innocently they laugh.'

"Cleopatra, observe, is pouring praise into Cecilia's ear, for that medley she has just played. She speaks to Anthony, on the same subject. 'It is a pity,' says she, 'people don't know when they have neither fingers nor ears for music.'"

"Anthony speaks to the host: 'Sir, the princely entertainment you have given, deserves public praise. It is the finest of the season.' The host rubs his hands—looks—why, it is my look he looks, with his fishified eyes—and he feebly rejects the praise, with his stam- mering tongue.—Ha! ha! ha!—Ah, they hear it, and how hospitably and jovially they do laugh."

"Anthony goes to Cæsar, Brutus, Epicurus, and Petronius Arbiter. 'Curse his stinginess,' says he; 'all his wine is fit only for the ladies; that third-rate port has nearly made me sick.' 'And, by Jove, he has no champagne,' replies Cæsar. 'His claret is the worst I've ever tasted,' sighs Brutus. 'There's nothing better to eat than hog's meat,' mourns Epicurus. 'It's wretched, indigestible work,' weeps Petronius.—Ha! ha! ha!—Yes; that's it. They do laugh egregiously and well satisfied."

"Now, the host is talking to his wife. 'Confound their praise,' says he: 'a tenth part of my year's income has gone to-night. There's Helena's dress, alone, has cost a hundred pounds, and the Prince de Paris hasn't come. It's all worse than lost. Everything is too good for this set. They devour like boa-constrictors, and swallow like leviathans of the deep.'"

11.

NEXT morning, on awakening, I discovered that if an abundance of wine acts medicinally in some stages of disordered health, it will disorder health itself, in spite of fine sentiments. My head was heavy, my eyes were dull, my will was inert, so that the sun rode in his glorious noontide chariot before I could bestir myself.

From the state of my appetite, I saved myself the expense of a dinner. I could not, however, bear to be alone; and, although the irritation of my stomach interrupted and prolonged my cabala, I managed to expiscate Archimago, and—Tenebrosa appeared.

"You are late for the advertisements," said he.

I shook my head sadly, to signify that I was in no mood for them, even if it were early enough.

"But I can introduce you to another stratum," he continued. "Rouse yourself. It is two o'clock, and in a couple of hours the efflux of business will be too far spent for our purpose."

He took me to a fine building in the centre of the city; which, I had before thought, was a cenotaph of the nation's wealth. I had known it as a huge, empty, curious place, with a mighty tradition of its predecessor. But, there was a great alteration in it at present.

It was three o'clock; and, on all sides, men were hurrying to it, as I have seen them do, with quieter demeanour, to a divine temple. The precincts were full and clamorous.

"Persons wisely meet here," said Archimago to me, "at a given hour, for an hour, to do a great deal of business, in a short time. We shall do ours."

He remarked to me, that the spaces between the pillars supporting the edifice, were called Courts, and were separately appropriated to the principal nations of the world.

"Here, we shall find news and news-seekers from every climate, country, and tongue. What they are about is somewhat of a religious rite, to a deity who has votaries among the followers of Moses, Christ, Mahomet, Menu, and Confucius,—a deity who sways them more than any of these lawgivers, as you may see from the distance they travel, or from the tribulation they undergo, to do worship at his shrine."

Tenebrosa wandered from court to court, speaking intimately with many merchants. He enjoyed this so much, that I thought he had forgotten me, and my aims.

"Come, here is an opportunity," said I to him. "Some of those your friends—"

"Not my friends, my—" answered he, looking out of the corners of his half-closed eyes, and touching his lips significantly.

"Just so. Well, they must require, some one of them, a person of my qualifications."

"Of course. I was really so busy after my own affairs, that I forgot yours. Here is the very per- son. Mr. Shuttle," continued Tenebrosa, going up to a florid gentleman, "may I trouble you a moment? Have you a vacancy for such a person as my acquaintance here?"

"Ah, you are very lucky," cried Mr. Shuttle. "It is three years since such a chance occurred. I am in want of a correspondent, &c., and I have fifty—oh, a hundred—applicants on my list; but, first come first served. I suppose he writes, fast and well; can calculate quick, and correctly as Greenwich time; knows French, Spanish,

and Italian. Well, he may suit, then. I am busy just now; but call in at my office to-morrow morning. He'll serve the first year, for nothing; the second, twenty pounds; and the third—as the business increases. It's as far as telegraphs and railways have reached at present, so that he has a good prospect."

Mr. Shuttle left us in a hurry. I was delighted, and exclaimed,

"Here is the very thing I desire."

"We shall see," remarked Archimago. "Attend to his proceedings."

The merchant went to nearly every one in the place. He smiled continually; and never spoke without making an apology. I noticed that his apologies were in no instance upon indifferent matters; but either concerned his honour and interest, or the other person's honour and loss.

"Good gracious," cried he to one, "I have so many things to think about, that I forgot I offered you a thousand pounds for those goods. Well, it can't be helped now. I must make it up to you some other way."———"He bought a similar lot of goods for eight hundred pounds, after his promise—hence his forgetfulness," whispered Archimago.

"Dear me, did I detain you an hour at my office, this morning?" said the merchant to another. "You really must pardon my forgetfulness. I will see you to-morrow."———" He fastened that man with a fictitious appointment," whispered my Attendant, "whilst he concluded a contract seven miles off, which his friend, who ought to have been there, would have got,"

"You must forgive me about those bills," exclaimed the merchant to a third. "I quite forgot them, quite—thoughtless man that I am. But you have paid them, I suppose. All right, I must arrange matters with you in a day or two."———"He made his friend take some wretched bad property at double its value," confided the Cunning Spirit. "And sign bills for the amount, promising, *viva voce* of course, long credit, by renewing the bills every three months for two years. When they were due for the first time, a couple of days ago, he did not answer the man's letters, and was denied to him when he called at his office. He will be denied to-morrow. The man, under the pressure, has sold the property, for a fourth of what it cost him, and mortgaged a house he has, for the remainder. In a word, there is an end of the transaction. This man is ruined, the other improves."

The merchant was now engaged with a person, who questioned the time, and the circumstances, of some piece of business, and a quantity of goods concerned in it; but the merchant stated the day and the hour; the place, the persons present; the words that were uttered; the state of the market at the time; and the exact quantity named and invoiced,—so particularly and emphatically, that he quite overturned the man's assertions; and when the man found himself defeated in facts, and would question the merchant's memory, the latter said, "Sir, I forget nothing," and so settled the matter, as effectually as could the Lords of the Privy Council.

"Shall we trouble ourselves to call on this gentleman, as we intended?" I asked of Tenebrosa.

"As you choose. I should say not. He will, there is no doubt, adhere to his agreement for the two years. At the end of that time, he will induce you—oh, yes! he has sufficient words to induce you—to extend the terms for two years more, and leave the additional remuneration to his discretion. You will get nothing more. Dismiss conjecture."

"But why is he not exposed?" said I.

"Such men as he of the acceptances, will not be heard in business circles," answered Archimago; "and business men themselves overlook his pretences, in the hope of profiting from him some other way; but they will be mistaken. His maxim in all things is, 'the world is wide;' and, whilst he is apologising in every Court, we shall go to an establishment not far from here, and see an exemplification of his creed."

12.

IT was Mr. Promisall's shop, in the E.C. division of the metropolis, and within ten minutes walk of where we were. Some watch-making establishments were renowned throughout Europe. This was one of them.

A gentleman was leaving the shop very discontented. He had bought a watch there, and had since ascertained that he had paid double its value for it. They had assured him it would go well, and it had gone ill both with watch and man. One of the salesmen had been near giving the unlucky purchaser another watch in exchange, when the proprietor came up and prevented him. The latter was now lecturing his servant, behind an angle of the shop.

"Sir, if ever you are so foolish as to exchange any article in this shop, I will stop your salary for a week. You need not have any scruples about offending customers. My rule is, that we can do with a single call from any person. There are plenty of people for this; and to call twice, I always suspect, will be a loss."

Mr. Promisall saw us, and advanced.

"Now, gentlemen, what can I show you to day?" asked he. "I guarantee every article in the shop to be what I represent, and watches for two years."

I replied, "But who will be guarantee for your words?"

This was very like a prompting of Archimago, though he himself never did use language of this nature, except when we were alone; and, now, he rubbed his hands in glee, as we left the shop, and cried, "That is one of my best beloved."

On returning to the service in Mammon's temple, my Demon stopped to speak to a short, thin, poorly-dressed old man. I was astonished to see so mean-looking a character in that place. Yet he was well known and much envied; for every one pointed, smiled, and sneered at him behind his back, but greeted him with affability and fawning before his face.

"That is Mr. Lovgold. A character," said Archimago, when he rejoined me, "at which all people rail; good and bad condemn alike, and hang their petty morals upon him,—writers in especial. He is a miser."

I gazed at the wretch as a specimen of self-gibbetted humanity.

"Worse than any other specimen, eh?" asked the Crafty One, reading nay thoughts. "I should say not. What are all struggling for? Honour, position, pelf, and a score of other phantoms which are only admired because they are in esteem among the multitude, and gold is in every instance the instrument, or the end. Well, his choice is to retire from the throng to his den, and there possess, whilst they are dreaming of possession. A good deal more innocent, too, I should say, is his action. Happiness, thoughtful men say, is in solitude. Well, that is his sphere; and, all through all, his ambition brings to him in its very striving as much pleasure as it does to others. But 'tis one in the eye of wisdom. Charity, alone, super- sedes the striving and the getting: and they—the mockers—know no more of the heavenly art of giving than he does."

I was about to quote the words of St. Paul, when I recollected our errand hither.

"Look at that benevolent gentleman," said I. "He is such a one as I would like to serve. Provided his trade would allow it, he does not seem as if he would play double with his servants, or keep them on too narrow salaries."

"That gentleman, Mr. Catchturn, would accept you at once," replied Tenebrosa, "and will expect you to be as unscrupulous as himself. He has just gone out to Cornhill, although he has tried in vain to get a word with that man yonder, with whom he expects to do a stroke of business, that will profit him a thousand pounds."

We followed the benevolent-looking gentleman, and saw him speak to a boy.

"Well, my little man," said he to him, "are you looking for your master?"

"Yes," answered the youth.

"I will see him in a few minutes; give me your message, and I will deliver it to him."

"Why, a telegraph has come that the French Government has decided to give the Mailbring Line of Steamers a subsidy of two thousand a-year."

"All right, my fine fellow: I will tell him. Run back to the office."

"Look, that benevolent-looking person is not coming back to see the boy's master," said I.

"Of course not," said the Spirit, laughing. "He got a hint of this business from the boy's master, who is waiting in expectation of the news to conclude a large transaction; and, now, that benevolent aspect goes to a share-broker, to buy five hundred shares in the Mailbring Line, which the subsidy will raise to ten pounds premium. That news is worth five thousand pounds to him."

"There's another egg broke," said I to myself.

"We shall take contraries, then," I exclaimed. "There is a sharp young man, gaily dressed: should we speak to him?"

"Yes, after you have heard of his last achievement in business. He, young Bornwell, had a fortune, and has good connections. The benevolent-looking Mr. Catchturn and Mr. Shuttle have divided the former between them, and realised ten thousand a-piece by jilting him out of the influence of the latter."

"What," cried I, "I know you can steal a man's money, but I scarcely thought you could embezzle the influence of his friends."

"Just so. Give me your opinion in five minutes. A certain government wanted the loan of half a million of gold pieces, allowing fifteen per cent, for ready money. That young man's friends secured the negotiation of the loan for him. The best persons to find the money were the great bankers, Plutus and Company. He knew them; but, to sway them as much as possible, he thought to bring in the assistance of his other friends. He saw them. They agreed at once to aid him—for nothing. Indeed, they saved him any trouble in the matter, and went at once to the bankers themselves; informed them of the business; made their own terms with them; told them that their young friend would try to interlope for a share of the commission, but they must not recognise him, and so the business was done. The young gentleman was given to understand that the loan had been effected by the bankers directly with the government, by means of telegraph; and thus, all his hopes of gain were lost."

"How he will hate these gentlemen."

"Nothing of the kind. He is in blessed ignorance. They tell him that the bank had the business already in hands when they mentioned it to them, and that they have lost their own profit. He believes it. A man like that

could not pay you a salary, nor earn one himself."

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"See that gentleman fussling about," said I. "He speaks to every one, and every one gives him a word. He must be a great man, and serviceable for my purpose."

"He is the very reverse of what you suppose him," answered Tenebrosa. "He is interested in the pettiest of all concerns. Mr. Seveneyes will do anything, however trifling or mean it may be, because it gets him the ears of the men he deals with. One advantage in coming here is, that it is not a place for idle men. This individual, indeed, is one of the busiest, as you see. The business is nothing, but he is something. He talks to a wealthy merchant with evident concern, and thereby gives himself an importance in the opinion of others. So he works, and will work, till one fortunate day he will hit the ascending current, and soar above every one that he now entreats favours from. But, as lie will rise by the subjugation of many, it is dangerous yet to have anything to do with him."

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"Surely I have caught the right man at last," I exclaimed. "That gentleman—walking leisurely through the crowds there—is, if I have learnt anything by your art, wealthy and confident of his trade, from his easy manner and happy expression. Such a one would neither be a niggard, nor suspicious in his affairs. Speak to him for me."

"Mr. Shirkskill is scarcely the man you think him," replied the Arch Interpreter. "He has just got a first-rate appointment for his confidential clerk, who has completed an enormous transaction for him."

"I thought such a man would be too valuable to lose. But," I added enthusiastically, "it is even as I supposed. He has benefitted him in acknowledgment of his great services."

"Not in regard to his services, but in jealousy of them," remarked Archimago, with a sneer. "He considers him too perilous a possession. He takes the profit of the transaction willingly; but he is afraid the man's abilities, if too apparent, would reduce himself in the eyes of his friends; he, therefore, parts with him, although he believes the man could make him thousands a-year, if he retained him. He saves himself from the dilemma by this act; makes himself appear generous; and strengthens his position by appearing to part with so able a servant so easily. Yet, indeed, his own fortune is made by the transaction in question. Never- theless, woe unto the clerk, had he shown the same talents, without the same advantage to his master."

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Archimago had talked to me for some time, so that we were anxiously watched by many, and some came, as it were, to overhear and catch a hint or two of important business.

"No," said I, in reply, "your reasoning is without weight, when I look around me here. After all, business gives the greatest delight; there is the highest mental excitement, and there is profit to boot. The sweets of retirement, after its toils, must be exquisite."

"Come, I see I have shocked you very much," said Tenebrosa, "now, let me amuse you. Take notice of that elderly gentleman there, Mr. Novelaught."

The person he indicated was fidgetting and wandering from one side to the other; he was in a very petulant humour; and, as I listened, his enquiry everywhere was, "Well, what news—what news—what news today?" The replies he got were, "Nothing particular;" "Things are as slow as a stage coach;" "Nothing stirring but the thermometer;" "Flat, flat everything, as a tune with four b's." On which the gentleman grew very irascible.

His pertness angered one person that he spoke to, who replied to him—

"If you are vexed at the staleness here, tell us something to enliven us. You've been over Europe and half of Asia of late. You have seen more than most of us have seen, and it must be interesting to hear of it all."

"Stuff and nonsense, sir," cried the old gentleman. "There's nothing new on the Continent, or off it. Confound it, sir, would you believe it, the whole thing was in the Guide Books before I set out. I saw nothing new after I had read them; and I got a deal more information from them, than from the confounded lakes and mountains and ancient citadels, and heaven knows all what."

"Nothing like home, then, sir," replied the other.

"No, nothing like home, sir," replied Mr. Novel-aught; "and yet, would you believe it, I have been taken in a vast deal more by that new country seat of mine, than ever I was in business. Confound it, sir, I bought it from my agent's representation, and my wife's taste. Why, it had to be such a place as I had never set eyes upon before. It had to be on a lovely hill: surrounded with grand woods: leading to beautiful vallies: romantic roads: magnificent rocks in the neighbourhood: and we had to be worshipped by, good gracious knows how—simple-minded villagers.

"Why, it's on a bank fit to break my constitution to get up. The woods are a lump of black, bushy things, not half so good-looking as St. Michael's steeple, which is a vast deal more useful too, for it has a clock and bells in it; and the tunes it plays is Julien's band compared to the screeching and shrieking of the birds in the plantation—yes, it's not a wood—every one there calls it a plantation. Vallies, too!—nothing but acres of farm

land; and the turnpike through them isn't even macadamised. The rocks, certainly, are big enough—precipices, in fact—but only fit for romances, where lovers can break their blessed necks from them. And as for the villagers—bah! a parcel of clowns that one cannot shake hands with, and they speak a language I neither heard in Paris, Berlin, St. Petersburg, Madrid, Vienna, Rome, Constantinople, nor Alexandria; and, heaven knows, I knew little of the lingo there. Then, one's shut out from all news whatever—all news, sir. We tried to accommodate ourselves at first, by admiring Cowper's description of the arrival of the post-boy—but it's all a mistake, sir."

Then, bursting out afresh, "And when I come here it's little better. Things never will be right till Edifice is at the head of the Government again. He gave us something to talk about, and made things move. Why, he would invent something to keep us moving, if there was nothing. I scarcely dare go home to my wife, with so little to say. She will know more from the newspapers than I can tell her."

Archimago explained to me, that the old gentleman had made his half-million of gold pieces in two days, by a national disaster.

"But he's right," added he. "If there is not a crisis soon, the people will collapse like him. It's very amusing."

I suggested that "no news" at least relieved a man, for he would have the less to talk about.

"Ah!" said Tenebrosa, "this is a terrible disease, of which you know not the nature. A wise man has called it a diarrhœa of words; but, I forget, we must call it intelligence, good-fellowship, progress, and so on. Mr. Novelaught is judicious in his vocation. He does not minister to his own malady alone. This Glutton of News has reason to fear—he is an *entrepre- neur* withal. When our friend gets home, his wife will tease him as much as he teases others, and be quite waspish about his barrenness; so all are quits."

"At least I must apply the words of the Great Book now," thought I; therefore I said, in the fulness of Tenebrosa's last exposition, "Well hath written the Chiefest of the Evangelists, that 'gold is the root of all evil.'"

". . . so . . . and so . . . and so," replied the Secret One. "The bliss is in the earning : the sadness in the retaining. . . . Men only call gold a vain and transitory shadow when it is a reality, as we have just seen it,—in the miser's possession. The world's throngs which esteem it, and strive for it most, at least see, if indeed they do not possess, least of it. Here," pointing to a distinguished merchant, "is a man—the type of the ten thousands—who, in starting his race for fortune counted his gold pieces day by day, and his heart throbbed like a seraph's at the song of praise, when he saw them increase and multiply. Then, he removed them into other men's hands to keep for him. Now, he amuses and delights himself with the figures that represent his wealth—seeing less of it than when he received weekly wages. His gold is become paper, the offspring of rags. But he believes himself truly rich, because he changes figures in his ledger; and the consummation of his ambition is to add a nought or two yearly to the account of his profits."

13.

THE revelations of Archimago laid me deep in the mire of despondency. Prostrate and despairing, I kept my chamber; nor caring, nor daring to call up the Mind-Seer. Time stood not still, but the busy, the merciless, deaf, cold-handed Fates kept weaving the minutes and the hours into the sad sackcloth wherewith man shall be clad in the mystical eternity; and thus two weeks sped from their swift shuttle. Then called I on the dread Spirit once more.

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I was astounded, on coming into the busy city once more, to observe great changes wrought in its appearance. Some of the bridges over the river, that I had left intact, were nearly demolished, and others were springing up to supplant them. Market-places, hotels, and houses, were in ruins, or had put on a new aspect. Arches had risen over many thoroughfares, and steam-trains swept above and between houses, to the jeopardy of upper tenements and tenants. What with digging up and pulling down, building and improving, restoring and adding, I could scarce recognise the old streets, or the old stream. These alterations, I remembered, had always been going on during my daily travels; but daily use habituated the eye to the work, so that it knew it not. My absence made the revolution seem a miracle. In their last days, this people were great changers; their metropolis, indeed, became the Hospital of Cities.

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The disappointment of my high expectations, that invariably arose when I lighted on some new prospect, but more especially on the revolting discovery of the desires and motives of those to whom I applied for an engagement, so sickened my heart, that I could rarely find resolution to pursue my inquiry further than one person each day. Being then left alone,—for, in my disquiet, I invariably dismissed the Arch Interpreter,—the burden of reflection would oppress me heavily; and the approach of a period when my means would be

inadequate to provide for the wants of the body, often made me consider the advisability of assigning it over to my creditors, and beginning a new existence. This I should often have done unhesitatingly, had not the appearance of my balance sheet at the Final Audit made me fear that a composition of that kind would be very unfortunate for me in the eye of the Great Judge.

At last, to relieve myself from the agony of thought, with a habit common in that nation, I determined to seek new adventures; nor would I permit Archimago to leave me, until I retired to my lodgings, wearied and worn, late in the reign of night. This was of double benefit to me; since his skill never failed to introduce us, on the monitions of hunger, to some company or other, at whose expense we could eat and drink freely; and he ever represented to me the real objects of men in doing and suffering.

The tone of my thoughts having been sad when I met Archimago Tenebrosa one morning,—for he appeared to me unwished for and unsought, as I wended my way through Gray's Inn Lane,—I said to him :—

"Your remarks on our first acquaintance, about the history of the nation, have troubled me very much. I have often desired to speak to you upon the subject, but something always came, just like that man, as I am speaking, unlooked for between us, and turned the discourse. Are there none who expose the danger to the nation from the commission of such acts as you name?"

"Many," replied the Inscrutable.

"Who are they?" I demanded.

"The adherents of the party opposed to the governing party."

"I am glad to hear that," I said. "And what do they propose as a remedy? Doubtless they would punish the criminals."

"Oh, no!" answered the Arch Spirit. "We shall see many of them afterwards; and you will find that the only object they have in their denunciations is to dispossess their opponents of power and annex it to themselves, so that they may commit the same acts. Inwardly, they rejoice at what horrifies you."

"How is that?" I asked, very much astonished.

"Because it will give them impunity when they do likewise."

"Then that is not the class of men I meant by the question," said I. "In my reading, I have met with one Socrates, of Greece, who spoke of justice as the safeguard of the State, and affirmed that philosophers were only just men. Are there any philosophers now?"

"Hundreds," replied he. "I am going to call on one this morning."

I hurried Tenebrosa, with all possible speed, to the house of the Philosopher, assured that I would hear a full exposition of the terrible acts that had disturbed me, and their effects on the mind of the nation.

In appearance, Mr. Malraison was of . . . . . he is amongst us still . . . . . and his smile told you that he knew more than you, or any living man.

I was astounded to find that he had not heard a word of the Bombardment, nor of the Capture. On my stating the cases to him, he remarked that it was a very small matter, and that the theory of government was of infinitely more importance. He spoke—he spoke beautifully when he came to this, and hinted at many reviews of his last book, which he said would show me how to understand his writings. I was rather nettled at his evasion, and I told him that I hoped to admire him more, at my leisure, but I pressed the subjects home to him.

"And what does all this amount to?" said he. "Ships sail; hands let off guns; guns send shot and shell against houses and human beings, and destroy them. That is all. Now what are ships, and guns, and shot, and shell, and houses, but matter? and what are human bodies, but matter? This is a difficulty with many men, which I have resolved long ago; and my explanation applies to all circumstances, in all times and places. To Persia and Marathon, Greece and Pydna, Carthage and Zama, Rome and a score of fields. It is of little consequence that armies are embattled,—that seas are bridged over,—or, as in the case in point, that wind or steam propel ships—or that they go to a place with or without a helm. Of as little consequence is it whether a man is killed by a brick from a house top, or by a round ball from a gun. I put my proposition in a few words—*War is but a contention of matter*. But far different is it with the human mind, which applies itself to the theory of government."

I would have said, "What of the people;" but Archimago interrupted the philosopher, crying—

"No more, no more! You are convincing beyond belief. We must not detain you longer. My friend, I see, is overwhelmed by your arguments."

The philosopher shook us heartily by the hand at departing, and his face was lustrous with triumph.

"Why did you hurry me away so abruptly?" I demanded of Archimago, when we were alone. "I was not convinced. I had a word for him."

"No doubt," he said. "But do you suppose I would let you destroy the fabric, when I had introduced you to the builder? "

"If that is all," I answered, "I will return, and relieve you from responsibility."

A footman opened the door, and in a few minutes he brought me the answer that the Philosopher was

engaged in study; and, as I was unknown to him and did not bring an introduction, he could not be disturbed.

"How comes this?" I asked of Archimago, on rejoining him. "Has your Philosopher so short a memory?"

"He suspects the cause of your return from your late manner," said he. "You must understand, too, that to such a person you must bring credentials of your admiration for him before he grants an interview."

"Then at least he is sincere, and belongs not to you," I replied.

"Does he profess to court admiration, then?" asked Tenebrosa, with a sneer.

"Enough! Do you say he is a philosopher?"

"A political philosopher."

"Oh, political!"

"Don't despair," said Archimago. "Here we have luckily met with another philosopher, who will sympathise strongly with you. Good morning, Mr. Finesse. Here is a friend of mine deeply deploring these aggressions of our arms in the east."

Mr. Finesse clutched my hand, and looked in my eyes eagerly. His figure was . . . . . more upright than he is now . . . . . in speech . . . . . void of figure . . . . . lack of imagination.

"I am delighted to find one conscience in the nation," said he. "Yet it surprises me beyond measure to find so great a dearth; for all men seek after money, and if money does not rouse the conscience, nothing ought. Mr. Malraison proposes schemes that never entered into man's mind before, much less have they ever been practised. He can afford, too, to ridicule the past governments of the world, since he has the patronage of the present one, whose shortcomings it is not the business of his theories to expose. Now take a matter of fact view. These expeditions have cost us several thousands of pounds . . . . . ."

He was quite correct as far as he went, but he would not acknowledge that there was any guilt in the acts beyond the squandering of money, in which he saw national ruin. My words were ineffectual. I could not make him see anything else than he desired to see, and, mutually disappointed, I parted from this gentleman, who Archimago told me was an eminent Financial Philosopher.

We met another gentleman on a subsequent occasion near the Central Bank of the Kingdom, who bore the same title as Mr. Finesse—viz., F. P.; although these initials belonged to a Society tacitly rather than formally organised. So far, however, from representing the spending of money recklessly as foolish or dangerous, this F. P. regarded it as judicious and beneficial for the nation; and his maxim was, "The greater the loss, the greater the development of resources, therefore, the greater the profit."

I found in my travels that Philosophy advocated two adverse propositions, and therefore had become a nullity—if philosophy it were.

14.

ARCHIMAGO said that it was luncheon-time with some high friends of his in . . . Square, and we should go there. As we turned a corner, I was nearly upset by a baker and his basket. It annoyed me considerably; and, after expostulating with the man for doing the mischief after he had done it, I looked for my Companion, and lo!—Archimago Sanguinosa, beautifully dressed, and laughing vociferously at my misadventure.

We were shortly in one of the most gorgeous parlours of the Square, and *tete-a-tete* with the two young Misses Gossipatwill to correspond. I recognized in them a pair of sisters, who by no means had shone in the saloon in which we were entertained a few evenings ago. But, 'twas all the same : they thought they had; and then the room they were in———ah! that was convincing.

The light came mild through Venetian blinds, the foot trod silently on Kidderminster carpet, the body reposed on thickly cushioned chairs, and the eye—nowhere. The adornment of the walls had been done by the Ornamental Decorator, the furnishing of the room by the Upholsterer, and the ladies by the Milliners,—all without the intervention of any mental effort, on the part of the denizens of this superb abode. But on the mantle-piece, of handsome marble, upon small side-tables, and upon various parts of the ladies' persons, were miscellaneous ornaments in great profusion—multifarious, heterogeneous, but dazzling, very much indeed, I should have said, by gas-light. I learnt that these various ornaments, from equestrian bronzes and marble statuettes to inkstands and earrings, were not valued, nor appreciated individually, but the aggregate formed what was called *taste*.

"Really you were charming the other night," said the eldest young lady to Sanguinosa. "What spirits you have to be sure."

"And so witty and good-natured: you moved more than one lady," said the youngest young lady.

Archimago laughed so loud, that we saw through the fissures of the blind that a party of ladies passing in a carriage heard him, looked up, and whispered together. It was an unmistakable laugh, and the ladies evidently said, "That agreeable Archimago is with the odious Misses Gossipatwill. What a fool he is; but all laughers are

fools." And the two young ladies in the room looked at each other, and evidently thought, "Oh, how we have piqued those peacocks, the Misses Elphingham and Browningham." And Sanguinosa rolled his eyes on the young ladies, so that each felt as though he were going to propose marriage, and that it depended on less than the toss of a halfpenny who would get him. In this blissful belief, the dear sisters felt somewhat of hatred towards each other accordingly.

They were very desirous of showing their acquirements, were these sweet girls, and they spoke a great deal of what they considered the last new thing. Many things had risen and sunk in the gulf of fashion during the past week, and now a novel floated on its waters.

"Oh, it is a dear hook," said the eldest young lady. "So poetically written; with such sentiment. There is only one low idea in it, where a baronet marries a governess. You know that's not possible, my dear Mr. Archimago. But it is more than made up by the dirty ways the girl has; and then, to be shut out from all genteel society, as she is in the last chapters, is a dreadful and fitting punishment; and then, the baronet is at liberty to marry again without any family."

"De-lightful, de-lightful," roared Archimago.

Captain Mars had ascended the steps, to pay a visit to the ladies; but he heard the unquestionable laugh, stopped a second, and walked slowly away pensive, and sucking the end of his cane. The ladies were not displeased. One of them expected him for a husband; he had been dilatory in his tactics, and this false alarm might hasten matters.

"And what is the moral of this agreeable book?" asked the Gay Spirit. "For you know every novel now has its particular moral—invented, though it may be, after *finis* is written."

"Of course, dear sister, you forgot that," cried the youngest young lady.

"It is hard to get at, but that makes it all the better," replied the eldest young lady. "I like novels with morals above everything else. It is so nice, after you have laid down the book, to think what the writer would inculcate by it. I tell papa that the amusement is as good as, and very like, his chess pro- blems: and it would not be disingenious at all if the author, after placing the characters in position in the last chapter, were to say, 'Reader to play and solve the problem in three moves.' Oh, this one is very, very deep. Then it has so many secrets, that you don't know which is the secret; and you have to puzzle yourself so delightfully to find out if there is any secret at all. Oh, you should read it, and tell us what you think is the secret?"

"But I should like to judge whether our tastes agree," said Archimago. "Have you got the book, that I may see its style?"

"Why, I'm sorry we have not," answered the eldest. "For, you see, we are in a Revolving Library; and, when a book comes to us, it goes away too, and once round it is out of circulation. But I will show you the style I admire—indeed, everybody admires. I have read the passage in this book this morning."

The book was bound in sky-blue scarlet; so that, recumbent on the fair arms wandering to and from the Revolving Library at weather-permitting noontides, young gentlemen might see, and seeing admire, the mental acquirements of the subscriber as developed there, if they found it not possible to admire them as developed in the human face divine. With a feeling voice, the eldest young Miss Gossipatwill read as follows:—

"The lady has gone out from the Hall one lovely morning upon a beautiful velocipede. She was induced by the vivacity of her own thoughts to try the turnpike road, which ran past the Hall at the distance of one hundred yards. Before she was aware, her lovely limbs had impelled the revolving wheels of the light and elegant machine, nearly a quarter of a mile distant from the Hall. Unobserved by her fair vision, a cloud had risen behind her, and she was only aware of its malevolent presence by the sudden obscurity of the light.

Words cannot describe her terror, when a few drops of rain began to descend; as she had put on, for the first time, only an hour before, a new morning dress, and a handsome hat, trimmed with tinted but expensive ribbons, a bow in front with roses overlying. She quickly brought the velocipede round, and immediately a shower fell, which turned the lately pleasant, soft, silent titillating dust into a quagmire, varying in depth according to the in-equalities of the road.

With quadrupled endeavours, the nobly-descended Philhelmina, made the willing velocipede push ahead right royally at first, scattering the mud in murky clouds upon each side, as easily as a man-of-war would part the foam. Further and still further, along the road and into the ruts, and slower and still slower, progressed the velocipede. It labored and struggled as if loth to give up the contest, but finally stopped when within fifty yards of the gate leading to the Hall.

The fair engineer now sought to back the fairy locomotive; but the powerful engine was within the grasp of a giant, in whose hands its strength was but that of a child."

The lady looked up, and beheld Archimago in breathless ecstacy and astonishment. He did not disappoint her, but cried :—

"And how did she escape?"

"She spoilt her dress and hat," cried the fair reader, "but a gentleman rescued her from her perilous position,

returned to the Hall with her, and married her exactly—yes, exactly seventeen months and a week that very day."

"Very interesting. I admire your taste," said Archimago, looking at the surrounding multitudinous ornaments also. "But I am anxious to hear what is the moral of the Secret Story."

"Why, you could never guess," said the youngest Miss Gossipatwill, the eldest being exhausted. "It is quite new. Don't go mad; and, if you do, keep out of the way of those who can afford to patronise private lunatic asylums. It shows ingenuity and genius, does it not?"

"Indeed it does," replied Archimago.

There now entered a lady, who, by the appearance of those her daughters, must have been fifty-five years of age, but by *her* appearance and manners, she ought to have been no more than thirty. On the usual compliments, she asked, "What we dear boys and girls were talking about." The young ladies informed her. She put on a serious air, and said—

"Do you think, Mr. Archimago, that the story is true? I've read it, but it seems strange that such things should happen. And to me it appears great immorality to write what is false. It destroys a good deal of interest, too. Oh, that people would not waste their time in doing so."

Sanguinosa replied with some pretty remark, which pleased Mrs. Gossipatwill very much, and she at once began a voluminous account of what she had heard people say, and what she suspected in matters chiefly relating to the characters of those she called her friends. If she had not shown such a nicety for truth in her remarks upon novels, I would have suspected that much she said was not correct. But no one, I thought, could be scrupulous of fiction in writing, and yet practise it in speech.

I was subsequently told, by my Genius, that Mrs. Gossipatwill was one of the ladies of his *cabinet*, who, with a little modesty, might have commanded the respect of the whole of her acquaintance for her grey hairs; but with artificial locks, teeth, and bloom she lost that, besides every chance of a second husband, although she was a widow.

Our interesting conversation with the mamma being finished, we left the ladies, having partaken of a glass of wine and a biscuit. As we went out, Archimago cemented an intimacy with the footman, who withdrew us into a small back parlour, where a delicious cold collation was spread, with ale and a dozen different wines. It was the butler's peculiar sanctum, and we enjoyed its mysteries before leaving.

15.

ON the following day I determined to go myself into the city, and see whether I could discover anything in the newspapers; fondly hoping that I would he saved from the unpleasant revelations made by the Arch Spirit; and believing, also, that in presenting myself alone, I might be more successful. Alas, the same bad fortune attended me. I had been so sharpened by my experience with the Mind Seer, that the only difference was in my beholding with my own eyes that which before seemed only revealed by a superior intelligence.

On being met with two or three rebuffs, I was returning determinedly to the News Room, to start fresh enquiries, when I observed Archimago before me. He did not appear to have recognised me. He walked between two gentlemen, and gently slid an arm through one of each of theirs,—all the time looking up in their faces and talking confidentially. In leaving them, he placed his arms round their shoulders, and simulated an extreme difficulty in parting.

I was indignant on joining him, and demanded whether, in the flesh, he had concocted an intimacy with these gentlemen.

"I am surprised that you should ask a question after what I have shown you. I was whiling an hour away ere I came upon you, and involuntarily I adopted the habit of those who I may call my choicest disciples. These men dream that I am more attached to them than to others, and that my secret opinions,—shallow things they are,—are confided to them alone. Yet, my children who practice these habits, would not even invite those arm-enclosed friends to their houses. But now, whilst we are on the way to the News Boom, let me call you to account for your remarks and thoughts on the Philosophers—particularly on your ejaculation 'political.'"

"Remarks and thoughts!" I cried, in astonishment. Recollecting who addressed me, I added, "Just so. Let us finish it in few words. Did you not introduce me to several philosophers? and are there not others with different names?"

"Certainly. Moral, religious, mental, and many other kinds."

"As I thought. Then these matters are dealt with as distinct things?"

"Such is the fact."

"Politics, then, are separated from religion. Thus the one is made barren of all good, and the other irreligious. Hence came my ejaculation, and flowed my thoughts."

"And that is what I suspected in your interjection. Take my advice. Don't mention a doctrine like that to your fellow citizens, or you will lose your reputation, if not your wits, in the sequel. We can only talk thus among ourselves."

Arrived at the News Room, Tenebrosa said,—

"If you want to see how a man may have a score of accomplishments, and by aid of them earn a degraded living, be curious enough to explore the following:—

"TUTOR.—Wanted, a Graduate of London, for a gentleman's family. He must be able to give instructions in English, Latin, French, German, Italian and Mathematics. Must have a good figure and pronunciation, and be of gentlemanly demeanour."

In search of the advertiser, we took a drive out of London, until we saw a green field or two and a few trees, and the expanse of the sky looked larger than I had seen it since I left my native village.

It was a pretty villa, called Allshow, approached by a short avenue. There were several faces gazing at us out of several windows, of different ages, complexions, and degrees of cleanliness; some were dusted with soot and some were smutted with violet powder. When we entered, one-half of the house rushed to the kitchen, and the other half to a bedroom, to discuss our appearance.

We were led into a large room, recently emptied of many active beings, as the confusion testified. Soon there entered a lady and gentleman, Mr. and Mrs. Riseandshine. They made up two moderate persons between them, although they had respectively seized upon the wrong proportions. The lady was tall, thin, and angular: the gentleman short, stout, and globular.

"Oh, there are two of you!" said the lady, at one mouthful.

Sanguinosa smiled, bowed, and replied that he only accompanied his friend. Mrs. Riseandshine was entranced with Sanguinosa's manner, and desired us to be seated. She was inclined to converse and increase the effect that her first words produced, but her lesser half cried,—

"No, palaver. "We must know each other at once. I, sir, can give a hundred and fifty a year, and you, I suppose, can take it. You understand, I see. Then you will give and I will accept services, as specified."

He pulled out a card, and half-extemporised, half-read,—

"English, for Jenny, seven years of age, and my wife,—"

"My dear!" she exclaimed, interrupting him.

"I mean—I mean," he said, "in explanation of the different terms used by fashionable company when they come here."

"Oh, that of course," she simpered.

"Yes, and sometimes unfashionable too. You remember you said *ride* instead of *drive*, the other day, and Lady Tickler larfed. But, to go on. Latin for me when I want quotations. I can scholarise it a little before company comes. French, for the girls. Two girls—delightful creatures—could boast of red hair, if they chose."

"My dear!" exclaimed the angular voice.

"I love to tell 'em so," said Riseandshine, emphatically. "It's the family complexion, and run down to us ginelagically from Rufus. Confound it, Madam, when will you learn proper pride for our piddigree? Italian, for that lackey of mine. We must have an interpreter for his lingo and actions; for keep him we must, for he is an essential curiosity. German—ah, why is that on the card? Oh, yes, for the Italian, too, if it's any use to him to explain the new infernal dishes that come up to table; for our cook's a German. Mathematics—now this is important. It's to measure the soil for a railway that intends coming through my land,—you'll make a plan of it,—and to keep a check on the kitchen accounts. A great deal of cheating goes on there, and I believe I'll make your money out of the savings in that department.

Now, as to your figure. Please stand up. Yes, I think you will do. Confound it, love, he's as well shaped as Brown Bess, Will you hand my lady to the door? Yes, that's it; beautiful! beautiful, indeed—graceful, majestic, superb. Take his arm, my dear—exquisite, queenlike, sublime, aristocratic! It is for my daughters, sir, too, that you are required—the apple blossoms of our home, as we call 'em—greengages and walnuts in one. Oh, I forgot. Faint, my dear, faint into that chair: you often do so, and so will they—filial daughters, as they are."

Mrs. Riseandshine shut her eyes, opened her delicate mouth of sundry hues, dropped her arms by her side, and would have dropped into the chair as directed, but Archimago nipped me. It effected a strange communication of ideas that nip. I removed the chair, and the lady recovered her fainted faculties as she fell. The spherical husband rushed to assist her, met Archimago's foot with his own, and involuntarily embraced his grovelling spouse. Our feet took wings, and our cab below promptly bore us from the range of the hostile household.

We were still in a lively humour that evening, from our adventure with Mr. and Mrs. Riseandshine.

"Come," said my merry-faced Sanguinosa, "I will show you a trick worth a hundred Asmodeii."

With that, he took me into a fashionable street. He leaped nimbly upon the railings before a house, and placing his foot upon a projecting brick, sprung up to the sill of one of the drawing-room windows. I followed

his example.

Rich damask curtains were drawn across the window. He gently raised the sash, and we overheard the occupants—indeed, saw them—between the curtains, which were not quite closed. An old lady was seated at a centre table with her daughter. They had superinduced feelings that had been invented by a French word *ennui*, and they spoke now and then of their friends.

A servant girl ran from the area of the next house and "hemmed" thrice, which brought another servant girl out of the kitchen into the area below us, and the two conversed between the railings.

The double conversation ran thus:—

* * * * * * * *

A carriage drove up the street. The girls knew it and fled. It came up to the door of the house. A gentleman stepped out and entered, and the girls returned to the area again.

We dropped from our perch. Cunning, scandal, and jealousy had wrought out their design in the parlour and in the kitchen.

What I had just seen and heard, made me more wickedly disposed than ever. I felt a strange, uncontrollable desire to explore further into the secrets of folly and double-dealing. Instead, therefore, of going at once to my lodgings, I cried to Sanguinosa,—

"I am desirous of seeing how the pretty pieces of pasteboard, that I was wont to play with, produce so much damage to morals."

"That I will soon show you," said—presto, without aught of the cabala—it was Tenebrosa that spoke. "Here is one of your old haunts. We shall be lookers on instead of players, and it will make a marvellous difference in your observation."

It was a large room, in which I had often played deeply, and turned many men's brains by emptying their pockets—a phenomenon often witnessed in those times. There were several parties engaged in the rites of Pam.

"A glance will tell you," whispered my Stygian Mate, "which are the unskilful and which the skilful."

Such was the truth. At every table there were two, sometimes three, whose calm demeanour, watchful eyes, and manœuvering hands, bespoke them the tacticians of a hundred campaigns.

"You will note," said Archimago, alluding to these men, "that their play is quite mechanical. A study no greater than that needed to learn the multiplication table will instruct a man to value every card almost involuntarily. The game is but a pretext. See, it is won there by the countenance of a novice, which reflects every card he holds, like a looking-glass—he is weak in trumps. There, it is lost by the man who gathers the trick—his look of wonderment shows that it has baffled a good card. There, the game is decided by the dealer's method of placing the cards in his hand, and his comparing each card with the one he has turned up. There, by a similar negligence, his opponent saw him place the knave of trumps second from his thumb, and thereby he infers nearly every card he holds. There, it is by a feint seducing the queen. There, by the careless air of leading with a poor card. There, by that tyro's abstraction of calculation. There, by an exclamation. There, by the exposure of a card.

"Thus you see matters here are not decided by skill in playing your own cards, which give a very limited circuit; but in the higher and more perilous play of circumstances around. This is the art of overreaching. And when you have a man studying his fellow in his words, looks, and gestures, to circumvent him for venal gain, it is the first step to crime. As an amusement, the game is delightful, with its excitement of the mind, but beyond that—ruin. The mind then invents more than points,—and you have found the nature of the inventions in the false gold pieces."

"This insight explains the horror many have of the game," said I, "and justly they eschew everything that smacks of it in personal affairs."

"Indeed," replied Archimago. "Look at that scene."

I had moralised, as above, after we had walked a considerable distance in silence, on leaving the gaming house. Archimago now pointed to the flames of a huge conflagration that rose and roared above the houses before us. We hastened to the spot. It was in Cheapside. In spite of the water poured upon the devouring fire, the whole of the valuable stock in a shop was consumed.

"Good God!" cried a bystander, "here is one of the inscrutable dispensations of Providence. The poor man's property is destroyed, and he will be a beggar. I do not doubt it will be a blessing, but—what benefit can any one possibly gain from this calamity?"

I looked at Tenebrosa, for him to relieve the man's incredulity.

"This is one of the waiters upon Providence repining withal," said he, smiling. "Job's misfortunes with him bring demurs as to Providence; in these days, however, Providence is jilted of the lessons it would inculcate from troubles like Job's. To-morrow morning we shall solve the matter."

16.

ARCHIMAGO took me, first thing next morning, to the owner of the shop that had been burned, as I have related. We found him talking to his son, a young man of twenty-two years of age.

"I come, Mr. Hinkster, to condole with you upon this inexplicable and unavoidable misfortune that has befallen you," said the wily Tenebrosa.

We had learned an hour before, that the fire had arisen from Mr. Hinkster having left a quantity of paper near the stove on leaving the shop, which had ignited there.

"Ah, but my dear friend, faith and prudence save us from much that the world esteems misfortune. I have been lecturing my son, here, on his sad ways. Last night he was engaged in that detestable and ungodly vice—gaming, and lost fifteen pounds. How different was it with me. My property was destroyed, and I have gained five hundred pounds."

"How is that?" enquired the Arch Dissembler.

"I insured that sum over and above the true value of my property."

Archimago looked strangely at the son, who seemed quickened by the glance, and sharply said to his father,—

"Then that is not gaming, is it not? I see you only deplore my losing. If I had won, there would have been no wrong."

"Explain yourself," demanded the father.

"Why, the Insurance Company wagered you a hundred pounds to four and sixpence, that your property would not be burnt. You accepted the bet, and entered into a solemn agreement, called a policy, for the execution of the bet. You've won. That's all."

Mr. Hinkster waxed full of wrath at these words, and we left him in its full enjoyment, Archimago being in great glee at the rupture between parent and son.

"Is it not thus in all things?" he said, as we went towards Cheapside. "A man sells you goods for twenty pounds, which cost him fifteen; takes your bill, or gives you credit for three months. In other words, he wagers fifteen to twenty that you will pay him for your interest's sake. The seller often loses. He prefers, in a general way, to wager fifteen to sixteen for cash on delivery; and even that is a risk."

"Then what about Shares—Government Securities?"

"Yes, what about them?—" replied the Spirit, with a pregnant interrogation. Then breaking off, he continued, "Now, see where the fire has been. Survey the spot. A contractor is employed to restore the premises. A score of agents are here to supply a new stock of goods. A score of principals are here to purchase the fragments that are saved, which they will afterwards publicly proclaim that they sell at an enormous sacrifice, and as such will sell more goods than ever that shop would hold. As for the Insurance Company, who pay for all, they rejoice at it as a great gain. They will settle for the whole without loss of time, publish the fact in the newspapers and in their own circulars. They will thus double the number of their insurers; for who does not love cash prompt. You see now that the Providence of our friend—which is Mammon, you would notice—is not sleeping here."

I now thought of the prime object of my life, and took Archimago to the usual news-room. What I had seen, led me to refer to another class of advertisement; and I could not help sighing when I saw the many good investments advertised, and remembered the money I had lost. I spoke freely to my crafty Director, who said—

"We shall investigate what these bagatelles are about. Which would have suited you best?"

I selected the following :—

"PARTNERSHIP.—Wanted, an Active or Sleeping Partner, with £200, in a first-class, old established, general business, capable of great extension. Apply to X. M.,———Street, E.C."

We went to enquire, and met a crafty-looking, dark, hook-nosed man, Mr. Turntwist, who said that the coming partner must pay cash down, and sleep for three months, when he would be admitted to the business.

"Exactly so," cried I, articulating without the effort of the will, "and when that time is up you will show a beggarly scheme, and pocket his money."

The man turned livid as a lily with rage, deeming not that he spoke to one inspired by the Spirit that was the master of his own.

As we retired, Tenebrosa remarked—

"You are correct in this instance. Your money would be little better in that investment than with your late lamented Friend, who wants an epitaph, although he had all the virtues of a millionaire.—"

"But all are not of this description," I said.

"Yes, they all would he so to you, my confident and innocent young man. For does not every man spread

his net by his advertisement, and the finer the threads he is able to weave the more fish he catches : after that, it depends on his strength to bring them ashore. The matter at issue is, whether you cannot catch the man in his own net."

"How do you mean?" I enquired.

"Why, look you, this is the counterpart to the advertisement we have just seen."

Out of his pocket, he produced a scrap of paper, dirty, crumpled and worn, and read from it as follows :—

"PARTNERSHIP.—A Partner wanted in a well-established and highly-lucrative business. Capital required, from £2,000 to £3,000, to purchase the good will of an old-established firm retiring. Address———. Principals only need apply."

"The net there caught the inventor. That same man, Mr. Turntwist, appeared as an applicant with £3,000 in ready money, for which a lawyer and three other persons vouched. He would not, however, pay the money for six months, so that he might be fairly introduced into the business, as he said. Before that time he made himself appear as one of the firm, and collected monies to the extent of many hundreds of golden pieces. He was very sharp indeed. He bound not himself by the law, but took care in his proceedings that the law should not bind him; nor did he make restitution."

17.

MY useful companion took me to an eating house in the City, where he claimed acquaintance with the cashier of the place, and, after partaking of what we desired, he got credit for the payment. This was opportune for both stomach and purse. During our repast Archimago said,—

"I am going to show you, this afternoon, a couple of characteristics which comprise the sum of the intelligence and opinion of the age."

A gentleman—Mr. Borrowsense—came in, and was asked what he thought of the European complication. He answered that he did not know, not having seen the morning's news. Upon that he called for a chop, and whilst eating it, he read an article in a newspaper, and then pronounced his dictum on the "complication" very authoritatively.

"If Russia," remarked Mr. Borrowsense, to another person called Mr. Filchthought, "if Russia insists on retention, and Austria wants a new treaty, defining the partition, the Emperor of France will demand compensation on the Rhine. England, of course, will object, and we shall have war, sir—war!"

"Yes," replied Mr. Filchthought, "I have said from the first there would be war; for you will observe that the Emperor will claim compensation, and Austria a new treaty, when Russia maintains the occupation, and England will not allow it."

"What is this about?" cried I to Tenebrosa. "A man gets his ideas from a newspaper, and utters them as his own. But, lo! he has no credit for what he says, since the person he speaks to repeats back into his teeth the very opinions he has spoken. Ah! this is an extraordinary, an exceptional case."

"We shall soon see," answered the Embodied Craft.

It was three o'clock in the afternoon when we sallied forth again, and, as we passed along Cornhill, a great hubbub arose.

"The oracle of lies has spoken," said my Attendant, who evidently gathered the cause of the confusion from the excited talkers around us. "A telegraphic despatch has just come in. 'A great battle has been fought. The North have defeated the South, and annihilated an entire army.'"

"And that is false?" I enquired.

"It will be contradicted in the morning," he replied.

I derided the Spirit, and he bore it patiently.

"For the present, I will finish the task that I have proposed to myself," said he.

We overheard a person, named Mr. Tellnews, informing Mr. Knowsit, that a large steam vessel had gone upon the rocks on the east coast.

"What has been the reason?" asked Knowsit.

"Why, my opinion is, that the castings of the engines were bad," replied Tellnews; "and that one of them has given way. At least I think so. Of course the ship became unmanageable, and was lost."

"Just what I remarked when the vessel sailed," observed Knowsit. "Silkens and Co. made them, and I was sure something would happen to them. In fact, I mentioned the castings at the time. For, you see, if castings are bad, some part is sure to give way; and if that does happen, as I always said it must," laying his hand confidently and confidentially on the other's shoulder, "the vessel is beyond all control—neither captain nor engineer can save her, and go on the rocks she must, if rocks are near. By the bye, have you heard that poor Pillars is very ill? The doctor says he has been indulging too much—wine and city dinners have done it all."

"Exactly what I thought," said Tellnews. "You know wine must be taken in quantities to suit your constitution, and heavy dinners are enough to unsettle anybody. Always what I thought.—"

The counter-play was exceedingly amusing—exceedingly.

"So it is with nine hundred and ninety-nine out of the thousand," remarked Archimago. "To pilfer from another behind his back is an old commonplace. The new style puts it in the dark—which is, to re-echo the theft before the speaker's face, and present it as original. Here is an example of the propagation of the system, for it is not the characteristic of Tellnews; but he has educated himself into it for his own preservation. It is the unrecognised art of selfdefence. Let us now hear how a man can filch from another that which he does not know, under the pretence of knowing it."

Two men were in high debate on the influence of the stars. The warmest, Mr. Textshow, spoke as though deeply informed on the subject, and was nettled at his opponent, Mr. Fullappear's scantiness of information, as well as illogical assertions. He stopped suddenly in his zeal, and, as if to catch his opponent, said,—

"Now, you are learned in Scripture, what does the song of Deborah and Barak prove?"

"Well, what does it prove?" coolly asked the other.

"Nay, I put the question to you, and, to come home, what does the record of the death of Sisera prove?" asked Textshow.

"You put two questions together, the song of Deborah and Barak, and the death of Sisera, which have no relation to each other that I see," observed Fullappear, with a sage countenance, in which all the lore of the Old Testament was incorporated. "And I do not see the relevancy of either of them."

This drove Textshow, gnashing his mental teeth, to expose the facts of which the other was ignorant, as follows :—"The stars in their courses fought against Sisera." Deborah and Barak's song, Judges v. 20. Nevertheless, Fullappear argued very presumptuously upon the facts, so soon as he heard definitely of their existence.

Our attention was shortly called to another couple of men.

"They speak of ordinary affairs," said Tenebrosa.

"I suppose you have heard of the accident on the Winkum Wankum Railway," said Mr. Learntall. "A most horrible affair. It sets all the country ringing."

"It is a terrible catastrophe," answered Mr. Twiggem.

"Friend Twiggem knows nothing of the matter at all," whispered the Mocking Spirit. "It only occurred last midnight, although he supposes it is a week old, and he will not seem ignorant of what he hears all the country knows. Note his art."

"Fifty killed," said Learntall.

"I believe that is an exaggeration," remarked Twiggem, sagaciously.

"Do you think the rope did it?" said the one.

"That might have something to do with it," said the other. "But, after all is said, to my mind it was the smash that did the worst."

"Ha! ha! ha! you are funny. As the cripple said, it was not the fall, but the sudden stop, that damaged him," observed the first.

"*Very* good. But you seem scarcely aware of the circumstances. How have you heard them?" observed the second.

"Why, the carriages were being drawn up an incline by a standing engine, leaving the locomotive behind," stated Learntall. "The rope broke, and down went the carriages into the locomotive at the bottom."

"Precisely!" answered Twiggem. "And what I meant to say was, that if the locomotive had not been there, no accident would have happened . . . . . ."

"Number two has drawn number one. That farce is ended. Let us look out for a fresh one," said Archimago.

His humour was so merciless, however, that I chose to seek amusement elsewhere. Verily the farces of my Disenchanter were the jests of the grave-diggers in the tragedy of Hamlet. Accordingly, I discharged the Spirit, and that evening I went to see an opera at the Imperial Theatre.

I was not without apprehensions that, being alone, I should spend the time unhappily. A gentleman, however, soon spoke to me; and he became so very entertaining, that things were made more pleasant than I expected. This new acquaintance, Mr. Fore-stallaloud by name, appeared to know the opera from beginning to end. He informed me of each scene by anticipation, thereby judiciously preventing any surprise that the author might have intended for the observer. He hummed the tunes that I might lose none of their effect; whilst he kept time with his waving hand, and criticized the accuracy of the singing without respect to the acting which accompanied it. Altogether he made himself agreeable to himself and my neighbours, who were so greatly pleased with his criticisms that they carried them away in their memory to retail as their own original ideas at home.

(I have notes of this and other operas in my pocket-book, but that relic of past arts is deposited amongst the

State-books of my Tribe. An order will be got for its production at the next meeting of the Witenagemot.)

From his general kindness and attention, Mr. Forestallaloud promised to be a more fortunate friend to me than my departed one; but, alas, the Imperial Theatre, from its many turns and passages, was as bad to get out of as a worse place,—overcrowding, it may be, applied in both instances,—and my friend, from exposure in our exit from the one, caught a catarrh-fever and went to the other.

18.

I CHUCKLED to Archimago, when I eliminated him as usual from the nothingness of my apartment next morning, upon enjoying myself in his absence. He laughed at my delight, and set me about analysing what I had seen, heard, and felt. The upshot was, that it was evident that of true pleasure I had known nothing; and the agreeable sensation I expressed, arose simply and solely from the knowledge that I had acted without his assistance, and in believing that I had deprived him of a pleasure; and this in truth was the secret of the self-satisfaction, and so-called pleasure, that abounded amongst this people in their last generation. Pleasure was malice.

I was not very well satisfied with Tenebrosa's strictures upon the "involute music of the operas;" so I took refuge in a class of composition, on which I could better speak, namely, the popular songs; and I quoted a sentence equally popular, made by a poet, about the songs of a nation accomplishing more than its statutes.

"So they can," answered Archimago, smiling, "when —*when*, like statutes, they can raise an army. Nevertheless, I doubt whether they could organize a *standing* army, like an act of Parliament. Few songs seek thus much, and certainly not the favourite ones now a days. One runs thus—

'Oh no, we never mention her,
Her name is never heard;'

and it proceeds to say—

'They tell me she is happy now.'

Another goes—

'In and out St. Stephen's Hall,
On Turkey like an eagle;
Here we make the money go,
And there we act the beagle.'

Another is—

'We've gathered shells by ocean's shore,
And when we tired we gathered no more.'

And another—

'I would I were a tatoe,
If I might be a victual;
For when Poll ate her dinner
I near her heart would settle.'

If my words are not literal, the sentiments at least are as lofty."

It was equally useless my waxing enthusiastic on the popular poetry of the age; as a sample of it, he recited the following with peculiar effect:—

"'Said I to myself, ere the cabby arrives,
And my wits are all muddled, and some would say stupid,
I'll court my gay muse, as some fond quadruped
Courted Lazarus, sick at the gateway of Dives;
For that we all know is the popular way,
In this age of advancement, this go-ahead day.
'Yes, let my reeking thought seek chums,
In the blackguarded souls, the foulest slums,
So here go we! All's fish t'our net that comes.

'Tom slit the young man from the country's pocket,
And all the green un's tanners, bobs, and wheels
Dick's claret-tapper feels,
Or lie in black Tom's patched and stinking jacket.
But soon Tom shows two disappearing heels;
For, look you! a tall Blue
Has spelled the lift, and twigged that Tommie took it,
And made that individual hook it.

'Such was the reason of Tom scuttling off,
But Dick, that fly bloke, who had blown the gaff,
Slunk up an alley, and a short time arter
Was in a snug box, swilling gin and water.
But to his stomach this was only gammon,
His appetite was whetted quite,
So when the Beak, sly covey, hove in sight,
He shared the haul with that ere pall,
Then with a prigged bob paid for veal and ham one.

'Now mark you the end of this wicked vocation,—
The Blue nailed Dick arter; all got transportation.
And take you a warning, my blades high and low,
By this tragedy verse, neither do so nor so;
Don't you peach of a chum, or try the fly go.'"

His gestures were stopped the instant the last word was out of his mouth, and he added—"Alas! no hood would suffice to cover the iniquities committed in this Sodom of the Nine."

On going to the city, behold the telegraphic message of the previous afternoon, which had been solemnly defended on the strength of electrical accuracy and speed, and many other unimpeachable grounds, such as the existence of armies in the North and South and so on, was emphatically contradicted in terms and sense. No one had doubted the despatch; no one now questioned the contradiction. I was ashamed at being guided by the popular opinion, but I always found that this course saved mo from being considered absurd.

"I see you were correct," said I to the Irrefragable Interpreter, "but I see no purpose in these false rumours."

"If the purpose had been seen it would have been defeated," replied he. "Six hours' belief in the intelligence served the object of its creation."

I would have derided Tenebrosa again, but for my immediate miscalculation.

"Refer to the history of those six hours," he continued. "You will see that a motion was made in the representative assembly to recognise, as it is called, the nationality of the South for having carried on successful rebellion. The clique which governs did not desire this. Party tactics could not preserve them at this juncture. Hence this invention, which shook and divided the hostile opposition, upset their motion, and tided over the

evil day."

We had by this time arrived at our destination. The advertisement I selected was as follows:—

"A Gentleman is required as the Confidential Agent and Companion of a person of rank. Age, from 25 to 35. Acquirements, beyond writing and accounts, not material, but testimonials must be produced of orderly habits, cleanliness, and unselfishness, to leave no doubt in his employer's mind as to appropriation of trust and monies confided to him. Salary no consideration. Apply personally, with testimonials, to A. X. J.,———Court, E.C."

"Now that makes me rejoice," I cried. "It must surely be an honest announcement. I will at least be safe in submitting myself. I desire to see that nobleman. He must be kind, and good, and rich, and how much more? I shall write at once to my father's friends for testimonials, and lose no time."

"No, not even in doing that," said the Prince of Action. "We shall go at once to the court."

"But what about the testimonials?" said I. "We shall be turned out of doors if we go without what is so particularly conditioned."

"Don't trouble yourself about them; I have some here," he replied, producing a bundle of papers.

"Those! Good gracious! Why they are forgeries," I exclaimed.

"They will suit our purpose all the same," answered the Artificer of Lies. "If, after an interview, you hold to your idea of application, you can write for genuine ones, should they promise to serve you better."

We were ushered into a small, dim office, where Mr. Spidersden, middleaged, snuffy, unkempt, old-coated, greeted us.

"An applicant, as I supposed," said he, snuffing vociferously, after Archimago had introduced our business. "A remarkable situation this. Never had such a vacancy in my hands before; never. Whoever gets it with a leetle, a very leetle diplomacy, will make himself virtually master of a fine estate and two thousand a-year. You seem very likely; and—let me see your testimonials."

Mr. Spidersden fingered and snuffed the papers as if they contained a legacy for him.

"Very good, very good," said ho. "The best I have seen. You have an undoubted character. In fact, from those convincing proofs, I can consider myself quite justified in advocating your case with the earl——I beg pardon—quite a slip of the tongue. But you know my time is valuable—is gold—and must be repaid by gold. Testimonials against testimonials are only testimonials after all, whilst a few words will effect wonders. Except—of course there are exceptions—except in the national assembly, where the case is settled beforehand and words are a cloak; everywhere else,—at the Bar, Mansion House, &c.,—words will do a great deal. But they have to be paid for, sir; they have to be paid for. In your case a trifle will do in the first case, say twenty pounds."

"I am aware of the rule," said the Subtle Paramount. "We were only passing at present, and thought we would just call in. To-morrow morning we shall come with the needful. I suppose that will do?"

"Oh, quite well," answered Mr. Spidersden. "I have not to see his—excuse me—till to-morrow afternoon; but before twelve, if you can, or it may be too late."

On coming out, I expressed my delight at the good prospect I had, and wondered only how I should raise the money.

"And would you really throw it away?" remarked the Mighty Seer. "Listen. The man's plan is very simple. You will pay him twenty pounds. In two days more he will say that he has advanced you a great step, and then ask for another twenty; and so on, week by week, till you are plundered of money, and—worse loss still—of hope. Then he will throw you off altogether."

" Should we try to get at the earl himself?" I asked.

"Do you suppose that there is such an individual?"

"Why, is there not? Well, the duplicity of this man is as black as——"

"Mine," mildly added the lord of the earth and the intermediate world.

"Yes, I forget," said I, chagrined. "Yet you outdid him with those testimonials."

"Oh, ho! Then you think he was deceived. Deceive not yourself. He looked at them curiously, did he? Why, the man is half blind, and could not read a line of them without spectacles. He suspected they were as false, as much as you knew they were. He himself set up in business ten years ago, and in his circulars—printed and sent amongst all merchants—he gave false references as to his wealth and position."

"And was it not detected at once?"

"Not to this moment."

"How was that?"

"Why, the names were of such eminence. The very Enfantdor was amongst them; and, as might be thought, no one dared to question the fraud, lest they should impeach that name."

This double-dealing extortioner put me sadly out of sorts. Archimago, however, led me hack to the focus of speculation, and on looking a while down the columns of the newspapers, I summoned courage to observe that

the following must be written by a man of a different character:—

"WANTED, A CLERK to a Cotton Mill, erected in a lonely suburban retreat. Majestic woods in the neighbourhood allow of pleasant musings, after the time of daily duty, during the silent hours of darkness; whilst a brook runs along, sounding musically over the refuse of stones left by the builders. The hour for commencing the diurnal vocations will afford the privilege of beholding the sun arise from his gorgeous couch during the greater part of the year. The mental operations in the office will strengthen the mind by application, without rendering it erratic by presenting before it a variety of subjects. A very slight remuneration will be desired by the advertiser for naming the benevolent proprietor of the mills, who employs half the rural swains and maidens of the district; and, by his enterprise, renders the scenery more picturesque."

"Oh, that gentleman who advertises," said Archimago, "will only ask you two hundred pounds, cash down; for he calls, believes, and would make this the golden age."

19.

To bring a reaction on my sickened heart, the Prince of Mysteries took me to a densely crowded meeting in a great hall. He was right—it was a change of air and scene. There were many speakers. All of them were energetic, and mightily eloquent with their shoulders, if not in words. These latter were pointed and particular, and I was strongly impressed with the forbearance of the people.

They were told they had not their rights; that they were little better than slaves; that this arose from their want of resolution and cowardice. Their patience and forbearance I did think most admirable.

As I went out of the door, several of the audience were standing about. A man pushed me. Imitating the marvellous example I had just witnessed, I forbore, and said nothing. Another man observing this, gave me a push; a third then twitched my coat; a fourth struck my hat; a fifth knocked it over my eyes, so that in a short time I was monstrously buffetted and abused; and all this through my forbearance in the first instance. I may not be able to anatomise the characteristics of the meeting, but, in spite of them, I learnt from my own sad lot, that no one could put up with an insult in any case without being abused by all around him. Their martyrs were adored only as historic facts.

Tenebrosa now took me through a series of scenes on which I do not wish to revive my memory; they might be received as hints and incentives, and give my own memory no sweet odour.

"Surely," said I to him, when we found time and space on Waterloo Bridge in which to breathe freely—"Surely, amidst so much lying, pilfering, slandering, and detracting, all men must feel petty and insecure."

"Far from that," replied the Tutelary Spirit. "If men know of insecurity, it is more of that of others than of their own. They attack as vigorously as they are attacked. And as for their own esteem, it is as great in the conquered as in the conqueror. When they fall, they believe it is not from the superior power of the oppressor, but by reason of inauspicious circumstances assisting his power. Besides, all men are heroes to some few others at least—if married, particularly to their wives. . . . . .To that merchant," alluding to a celebrated person we had met in the city, "the prime minister is an universal genius; but, to his clerk, that merchant is a much greater man than the prime minister; and that clerk's wife believes her husband to have greater capacity than his master; his master's reputation is in his keeping—she knows that; and, indeed, his master's pounds would, she thinks, cease to increase and multiply, and would become extinct, but for her husband's home and foreign policy in the office. What is more, his master's pounds are not of near so much importance in her eyes as her husband's pence. All men are heroes, in honesty or the want of it; in wealth, or the want of it; in talent, or the want of it; in health, or the want of it; in love, or the want of it. Above all, husbands are heroes—to their wives."

"Ah, if the married men are," said I, "what of the others?"

"Yes, of the others," said he. "We shall see."

He transferred me to a pleasant party, where there were maidens for husbands, and husbands for maidens; parents to negotiate, and altogether a pretty market.

After the usual tea and scandal, he said, "They watch us, let us watch them."

Not without wit was my genius, for he transformed himself ere we entered, and was not the smart, sharp-looking, loveless mortal of busy life. No! his tenebrific guise was moderated, and he bloomed in visage, beard, and wig, the uproarious and enchanting Sanguinosa. Out of his jolly pipe came a thousand luscious inanities of speech, and organ tones of laughter that overturned the hearts of all the company through their ears. And, seconding his words and roars, his rolling eyes shot looks of varied qualities. Now his pleasantry was mocking the infirmity of some unsuspecting gentleman; now it was wooing soft some obstinate dame; and now—'twas everything, yet nothing. And, chiefly, with his language and his laugh to every fair one did he pursue the litany of love; whilst, all throughout, his guileless-looking guile provoked no jealousy—no, nor

deprecation.

The Matchless Scrutiniser was rarefy silent.

* * * * * * * *

"Sweet Angel," said I.

"Yes, Miss Lighthought does listen intently to his words, and looks up to his face delighted, confiding, &c. And she plucked her nosegay to pieces last night, listening to his companion's vows, and sighed, and sent him away happy. Genial beauty! sympathising with every tender sentiment, and sincere with no one. Sweet illustration of our metaphysics! Her heart is a sheet of white paper, which receives every scrawl."

* * * * * * * *

"Yes, Mr. Sillyboy, junior, is pale and thoughtful. His sweet-scented pocket handkerchief, in its frequent use, betokens a mental thaw. He has a piece of red flannel under his collar, and will drench himself with whisky hot—three times hot—three times whisky—tonight. A lady with more romance than he has sense, gave him a catarrh at her balcony last night instead of sentiment."

* * * * * * * *

"Yes, the ladies are very flippant and tripping of tongue; but their letters! ah! you should see them. 'To be near them,' says one of their songs. Well, at that time you would be astonished. 'What shall I say?' they enquire petulantly, imperatively,—imperatively, cry they, 'What shall I say?' At no other time do you hear the question."

"And the men?" asked I.

"Silence," cried the ruby-faced Sanguinosa, with a change of countenance. "We are of them, and women traditionally—"

"That reminds me," cried I, interrupting him, "according to tradition, why did you not take a woman's form?"

"That you shall understand hereafter. Keep things as they are. The finest fruit for the grossest appetite. Angels for earth worms."

Leaving those Bowers of Bliss, we found ourselves just in time for a Theatre, where a celebrated actress had performed nightly for some months. By a contrivance, known only to those who frequented these places of amusement, Archimago obtained a free admission for us. We preferred the pit as the best point of observation.

"Behold," said Sanguinosa, indicating the tiers of boxes and the stage—"behold! actors come to observe actors."

We waited impatiently for the great piece of the evening. When it did come, I found, as usual, that its purpose was to introduce a hideous monster which nature had brought into the world, and which it was the object of the art of the author and stage properties to send expertly and expeditiously out of it. A scheme then very popular.

The man who acted the tragic character, did it with wonderful acuteness and ability; but, when the course of his soliloquies led him to satirise a few of the views of the age, the audience set him down as a good general comedian only.

The machinery of the stage kiss worked smoothly and delicately, and the personal summary of what had gone before was admirably accomplished at several stages of the performance. The heroine herself,—lovely, young, Grecian, pale, and self-possessed,—moved by one supreme passion, which opened now on the shrill note of hate, now on the dulcet tone of love,—was eloquent in her face and gestures.

"Very good," cried Archimago, "but why does she prepossess the audience as Phryne? It is ingenious."

I too would have said something severe, but my eyes grew moist, and I could only exclaim,

"What fools these actors do make of us."

20.

I GOT to my lodgings barely in time to save myself from Sabbath desecration.

On this day I did not call on the Monarch of Spirits. In the morning I attended divine service. The temple I went to was frequented by one of the greatest orators of the age; the priest, besides, was one holding a high ecclesiastical office, and I fairly expected to hear a sermon that would accord with the presence of the orator and the promise of the priest; but, in his first sentence, the reverend speaker made an anticlimax. A great defender of the church was there, but the sermon mauled and murdered its chiefest doctrines. A deep theologian was in a prominent position, but the divine strangled himself in the trinity. Nevertheless, I was much edified. A splendid apotheosis of one of the nation's kings was painted on the ceiling, and outside the building, the apotheosis of his successor had been practically effected.

I missed my matchless friend in my travels this day, and resolved that he should accompany me on a

similar occasion.

21.

OFTEN—often, like many mortals, I had complained that life was too short. On waking up on Monday morning, however, I had the toothache, and prayed to heaven that three days were over, as the anguish could scarcely, I thought, subsist for a longer time.

I went to a renowned dentist, and was shown into his operating room, where hundreds of glittering instruments lay in hostile array on surrounding tables, and the penal blood of a score of martyrs imbrued basins in every corner. Fancy never acted so strongly on my nerves before. Pain imperceptibly fled from me, and with like celerity did I from the house, escaping fees and frenzy.

In half an hour the fiend was raging again in my tooth, making it Hades. I flew to another dentist. This practitioner concealed his instruments from me, and retained my torments in *status quo*. He glided behind me, and I was surprised, in an instant, to find the culprit tooth fastened in iron fangs. Alas, his skill was of no avail; instead of eradicating the bone, he only broke it in.

"Oh, dear," I howled, "all this trouble and pain for nothing."

"For nothing!" echoed the dentist, calmly; apparently meaning more than I did, "Oh, yes, exactly."

In truth he did charge me nothing for his ineffectual operation, but he gave me an innocuous coloured mixture, for which I paid half-a-crown.

There was no option left for me but to summon the Arch Spirit, who appeared as Sanguinosa. He took me at once for a walk, and introduced me to a party of gentlemen, who were enjoying themselves over a bottle of wine. We were a merry set, and would have been dull enough had there not been a superabundance of words, and one thing suggested another.

An adventure of my own during my divorce from Archimago, was the commencement, as follows :—

"I had found a sweet solitary house by the river side, looking up to Richmond Hill. You all know the house. I ordered dinner, and to my surprise a handsome goose was brought in, perfect in all its parts. But what of a fowl when one doesn't know how to carve it? For a while I was puzzled by anatomical theories. They vanished before my appetite. Art, thought I, is of use only in society; I am alone with Nature. I discharged the waiter from the room, cut off all the dainty and fleshy projections, and was appeased. I then found myself again alone—with the mangled goose. Horror of horrors, when other eyes should survey these lacerated remains! Yes, *what* would other lips say when other eyes beheld? Ten minutes I was absorbed in dismay, until the goose *within* sat uneasy in its place at the goose *without*.

"The window of the room was level with the road. A beggar looked in, and appealed for alms. The bright dawn of invention flashed upon my soul, followed by an instant night, and chaos of fierce, uncontrollable, delirious, dismembered thoughts and motions. The window was thrown up, the dismembered corpse was in the beggar's arms, and he out of sight, ere my reason returned.

"Uninvited and smiling, the waiter reappeared. Soon that smile vanished, as had the goose. His gaze fastened on me, but no symptom was in my person of appropriation. Silently gliding, as a sylph of the stage, glided he from the room. Then again I was alone—with my own thoughts.

"On tiptoe came the landlord, without question or greeting, and beheld the magic disappearance, which he imitated voluntarily.

"Mild interrogation was there none to me for dessert, wine, or cheese, although the boots and the barmaid succeeded to the host.

"'No more of these tragic shadows on the vexed scene,' I cried.

"Frantically rang I the bell. Mellifluously I demanded the bill. It too came like a tragic shadow; for the name of the departed fowl appeared upon it, as if drawn by a spiritual hand. With signs it was delivered; with signs I paid it; and more with signs than sounds I departed, leaving the waiter fully feed for his designs in his attendance, and the legacy of the vacant dish to the host's executors, administrators, and assigns."

A mighty roar of laughter was led on by the invin- cible Sanguinosa, at which I thought the ceiling would crack, as I have heard some say the heavens ought at Jove's dread thunder. But, during the roar—even with the roar—aye, the sibbillation had scarce departed from my tongue—ere,

"Speaking of administrators," said one of the company, "what do you think of that trick of the administration? It's very good. Flower-in-mouth goes out, and Boroughwine comes in. But it's all the same to Flower-in-mouth."

"How's that?" cried all.

"Why, there is that pet treaty of his, which everybody thought would be destroyed by a new government. They don't find it so. Flower-in-mouth has made some pretty complications, that if the treaty doesn't go on,

there will be war. Now the ministry can't come in on the peace principles and make a war at once; so they have to conclude the treaty and get Flower-in-mouth to assist them. Very good, isn't it? Ha! ha!"

Ha! ha! hah! hah! And the mighty noise of Sanguinosa arose—a vast, a boundless ocean of laughter, swallowing up the petty rills and streams that flowed on every side.

"That reminds me," exclaimed another, catching the company in their boisterous burst, "that our worthy friend Splinters went out yesterday for *flowers*. He has been acting on the constitootional principle lately. His dissipation, you know, began to tell on him. So he gets up early, takes a long walk into the country—Hampstead way. At least that is what he has to do—so he began yesterday morning—has to continue it three months—a good joke, I assure you—got to the nursery, and so far as a bunch of flowers—but, confound it!—he went to a public with the gardener for a leetle refreshment, and he stuck there till he got drunk—mortal—and was brought back in a cab. Bless his constitootion."

Ha! ha! hah! hah! Redoubled roars, vinous, confused, and husky.

"If you talk of constitootions and treaties," gasped another, for the first word, "who licks the tricks of Dick's elysian physician, with his thesis of negotiations, potations, and circumrotations? Saw him barley-corning this morning, and then, anon, skipping, tripping, snugging, hugging, lightly, tightly, sprightly, politely, a fine divine bottle of wine for the poor stick Dick. Confound it! 'twas real champagne for a campaign ere dinner. There's a doctor who knows what a constitootion is and how to treat his patient."

The culmination of the ebullition which followed this was seized by another, who shouted—

"Apropos of champagne, our friend the histrionic Jeames was at our western port t'other day. His champagne gave his audience real, and they hissed. He mustered his muscular faculties to the footlights, drew his sword as Carlus Magnus might, and exclaimed, 'What! Jeames the first hissed by the people of Lightspond, where every stone is cemented with the blood of slaves. I will not submit,' and he was carried off—"

The gentleman was caught by applause, and *it* was caught by a watchful vocalist.

"Mentioning slaves" shrieked he: "suppose we have 'Rule Britannia?'"

So we had it.

Scarcely had the singer finished before a gentleman called for "spirits," and another on that word proposed table-rapping, to which all agreed except Archimago, who pulled me gently by the sleeve, and whispered that we must be going.

22.

"AND your reason?" I demanded.

Not receiving an immediate answer, I turned to my mystic companion, and the Laughing One was gone, and in his stead was the sharp-visaged Tenebrosa, who replied,

"They are going to amuse themselves with what is worse than an error as they practise it, and which, if they did practise rightly, it is not a matter for amusement."

"Well, it is one of the foibles of the time to communicate with departed spirits," I said. "One of these days they may get hold of you as I have done."

"Never," answered my cold, uncomely Mate, with his low, mocking laugh. "Never. They are not equal even to the Witch of Endor."

I may not say what further passed between us on this subject. Suffice it to observe, that it moved my curiosity with respect to the being of this Strange Existence with whom I associated, and that he promised to satisfy me that very evening.

As to the communication with spirits, so prevalent in the nation before its fall, it was not undertaken with the view of giving information for the quickening of conscience, the guide of conduct, or the unveiling of a mystery, but rather as a diversion. They did not deal with the spirits voice to voice, but by means of raps upon tables and walls; accompaniments to vulgar songs on musical instruments; marks on arms and feet; and the object was generally to specify amounts of money, names, ages of persons, and so forth (for which purpose, also, in all times ingenious people had educated quadrupeds); but in no instance had the communications the correctness, utility, or honesty of a schoolmaster.

It was acknowledged by the devotees of the art, that many of these communications were contradictious, equivocating, and lying. Therefore, it began to be set down that these communications were the work of drudging, deceiving, evil spirits,—of which the hierarch of their writers gave a foreshadowing in the character of Caliban,—and that their disposition in this, their menial employment, would be to mislead and annoy mortals.

It is to be regretted that these enforced spirits were not made to lift stones as well as tables; build houses as well as theories; overturn armies as well as doubts. But much more sad was it that the good, the beneficent

spirits, were not evoked. As, however, communications were obtained only by means of a qualified person called a *medium*, we may infer that the spiritual condition of the *mediums* was fitted for evil spirits alone, and perhaps some will find in this the reason of the nation's fall.

This subject being finished between us, I said,—

"As we have not been able to find candour and innocence in the city, let us seek it in the bosom of Nature.'

And as it was in the heat of a fine August day, we retired to the shady side of a lake in a quiet park.

A palatial structure looked down on half-a-dozen soldiers, parading in front; and the soldiers looked down on the water below. Sweet trees and ample lawns; water plants and fowls; islets green and fretted by the crystal water, made a rural scene, which gratified the senses long tainted by busy habits.

A venerable gentleman (Mr. Worldwise, as we after-wards learnt) was seated within the umbrageous coolness of a tree, upon a free seat,—the vendor of seats looked upon him as a loss,—and he gazed upon the sailing ducks with a kindly eye. We shared his seat and participated in his thoughts, which he freely unbosomed. Tenebrosa contrasted the turmoil of the adjacent city with the calm and innocence around.

"Ah, yes!" said our new acquaintance, "and it might be painful to think what sin is going on there, whilst all is so pure here—that is to say, if this was not really so pleasant as to eradicate all unpleasant feelings."

"If they could only taste this as we taste it," said Archimago, "what good it would do them."

"Yes, I would love to see the multitude here, and in the enjoyment of such pleasures," remarked Mr. Worldwise. "Still, it might be incommodious—but why not have enjoyment where they are? That's what I say. It is only their wicked practices that make them so unhappy."

"You are right, sir," replied the Incarnate Guile, demurely shaking his head, and slowly adding, "Wicked practices do produce unhappiness."

At these words the gentleman for a moment lost his sedateness, gladdened in feature, and grew shriller in voice.

"Yes, sir, whenever a man comes to me," he cried, "and says he is unhappy, I tell him he must have been wicked, and I can have nothing more to say to him. If he says it is because he is poor, I give him the same answer. I am happy—always happy—I tell them so—and I tell them what makes me happy, and what will make them happy. It is a great secret I have—a golden maxim—that was taught me when I was a boy. I have stuck to it through life, and I am rich as well as happy by it. It is this,"—and we both leaned earnestly towards the blessed being that we might not lose a syllable, and he gravely, grandly, uttered these words, as if for the first time they had been spoken in the universe,—"Honesty is the best Policy."

Then Tenebrosa laid his hand on Mr. Worldwise's knee, and looked intently in his face, as though he had unfolded to him the mystery of man's destiny.

"You are right sir," he said. "That is a helm which if a man holds by he will ascend to riches, walk in a race of usefulness, have all a soldier's virtues under Providence, and spend his sere and yellow leaf in halls of contentment."

"It has been all that to me," cried Mr. Worldwise. "I uttered it every day when I was a boy, and through it got more favours than any of my playmates. When I was a young man I did the same, and was trusted with untold sums, whilst it rendered all my fellows suspected. It was harvest and fruit to me; and my master dying, left me his estate past all his friends and relations. It was indeed fruit and harvest to me. They were all disappointed, and mostly left poor, especially his sisters. But it only proved the value of the glorious maxim, for they had never broadly asserted it, nor stood on the platform of its truth."

"You are wise, you are happy," cried Archimago, seizing Mr. Worldwise's hand with both of his. "I must hear no more, lest I be envious."

"That is a maxim I have always admired as much as our acquaintance," I said, as we wandered over the Park towards Whitehall. "And he is a singular instance of its correctness."

"Bad proverbs have pleasant illustrations, as obscene books have fine plates; if it was not so, where would be their utility?" answered the Inscrutable.

"I am puzzled at your language," I cried. "Has that man done wrong in acting upon the proverb? Is the proverb itself a part of your artillery?"

"Certainly. The man who concocted it is as dear to me as the man who injected the thought of the Tower of Babel into his nation, and brought about the confusion of tongues. Think for a moment of what he achieved. Honesty was the sheet-anchor of man's salvation. It was the offspring of a pure heart. That man made it a 'policy'—the offspring of a corrupt one. He was one of those conquerors of the human soul, unknown, unheard of, with wider conquests than ever honoured the standards of an Alexander or a Cæsar, and unconfined here, like their short arms, by the force of death. Alp Arslan called himself the *Seourge of God*,—that man was the Scourge of Archimago. Logicians analyse matters of trivial consequence rather to show their own art than to improve their neighbours. They might be of some use to man in this instance, thus—but keep the secret.

"Look in your lexicon. *Policy* is an 'art,' a 'management;' it is 'prudence,' it is 'strategy.' So then—

"Policy is a strategy.

"Honesty is the best policy. Therefore—

"Honesty is the best strategy.

"Treated, then, as it is advised and acted upon,—not as the impulse of a pure mind, but as an art,—we have to take it as a mere appearance, which results thus—'the appearance of honesty is the best policy.' Was there, could there ever be, so fine a formula for making—my subjects? Suited equally for the platform, the haunt of business, the family circle, and the pulpit."

"Silence," said I, for whilst he spoke, night had come upon the earth. A deep unwonted quiet held our ears,—as in the momentary pause between the ebbing and the flow of waters, their turbulence and noise is stilled, so was there a transitory peace between the tides of daily life retired, and the tides of nightly strife still pent. The stars of heaven glimmered upon us in their golden courses, and a voice, as 'twere the voice of thought speaking to thought, came from the infinite which brooded on my sight,—so that I silenced Archimago, and gazed and listened heavenwards in awe.

"Methinks it is no vain belief that there is harmony in the motion of those bright orbs. That there is sympathy, too, between their order and the pure action of the law in human affairs. So nicely balanced are they all, it seems to me as if one atom less or more would confuse the whole of the mighty system,—even as in our physical being a trifling superfluity or want shakes the nice point of certain health."

"Thanks for your interruption," said the Mind-born Phantasy, "which brings us exactly to where we were. It is just so with the intellectual system. Add one false proposition, and everything is reduced to original chaos, without form and void. This has been accomplished by the proverb on which we have been speaking. . . . As to *policy*, if the interpretation of the lexicon does not suit you, go enquire there where it reigns, behind a throne although not upon one."

We had issued from out of the gateway of the Horse Guards, and looking in the direction indicated by Archimago, I saw the Tower of the Legislature of the land gazing upon us with two flaming faces.

I was wearied, and desired Archimago to accompany me to my lodgings.

"And now," said I, "what will you drink,—Madeira with Peter the Great, Malvoise with Cromwell, Romanee with Cardinal Richlieu, Chateau-Margau with Talleyrand? or, Chambertin with the great Napoleon, Tokay with the great Frederick, Lurenne with Henry IV., Sherry with Francois I., Alicante with Charles V., Medoe with Marshal de Richelieu, Champagne with Marshal de Saxe? or, Old Chablais with Rabelais, Marsala with Rubens, Montepulciano with Cervantes, Chianti with Le Sage, Sauterne with Humbolt, Vou-vray with Balzac, Johannisberg with Goethe, Port with Byron, Malmsey with Shakspeare, Ale with Burns, Coffee with Milton, or Water with Shelly?"

"Old Chablais, without doubt," replied Archimago.

"Ah! rare stuff to thaw the soul and loosen the tongue. I must have a chirrup."

June brought in by wind and hail;
Roses blighted ere born;
Day-dawn breaking cold and pale;
In the nightingale's breast the thorn—
Beauty dead in beauty's birth;
Music silent in hall and grove—
What care we?—ha! ha!—our mirth
Sparkles up in the red wine cup,
And we know all that man can know
Of worth, of wit, of love.

Masks of hate with winning smiles;
Lies for gain and power;
Sweethearts', traders', neighbours' guiles;
The golden sting of fortune's hour—
Hearts reft of life, life twisted in brain,
Hypocrisy in hands, hearts, faces—
What care we?—ha! ha!—our gain
Is so divine from the red, red wine,

That age wins youth, falseness learns truth,
And we sing with the Muses and dance with the Graces.

"I fear your dance will only be a reeling dizziness," I said.
"Come, come, respond in verse," cried Archimago.
"Well, if the singing in your ears does not prevent your hearing, I will oblige you."

Pray talk no more of wine and madness;
Wild thoughts and beatific vision;
Their glory is but crowned with sadness,
Their laughter dies in fierce derision.
Drink, when nature doth require,
And let the murmuring streams,
Translucent as Apollo's beams,
Quench the desire.

Under no other inspiration
Let us survey men's minds and actions,
Sift fraud, unveil equivocation,
And search the springs of loves and factions.
Be calm as is the calm deceiver;
See beauty with pure eyes,
And hear the poet's melodies
In solemn mood,—in honour to the giver.

"Now change the measure and the theme," said the Sovereign Mover of Men. "My promise——as to myself——"