

CHAPTER XVI

1851-52

OPENING OF GLASGOW ATHENÆUM—EXHIBITION OF 1851
— FIRST OFFER OF GOVERNMENT OFFICE — THE
COUP D'ÉTAT—DISCOVERY OF ARDTUN LEAF-BED—
ELECTED CHANCELLOR OF ST. ANDREW'S UNIVER-
SITY

AFTER our return to Rosneath, in January, 1851, I was called to Glasgow to fulfil an engagement to open in that city a new Athenæum for public reading and study. The largest hall in Glasgow was full to overflowing, and I had an enthusiastic audience. As this was the first of many occasions on which, during forty years, I have been called on to address great meetings in Glasgow on all subjects—social, religious, and political—I wish here to bear my testimony to the great superiority of the people of Glasgow over all others whom I have ever addressed, in respect to that liveliness, quickness, and high intelligence on which every speaker must depend for all the pleasure and all the satisfaction he can possibly derive from his exertions. Next to them, and very near them, I should place the people of Paisley.

When we returned to London in the early spring of 1851, we found the whole world talking and thinking of little else than the approaching Great Exhibition. The present generation can hardly realize what it was. We are now familiar, even to weariness, with repetitions and imitations of that idea. But in 1851 it was an absolute novelty, and both friends and

enemies talked the wildest nonsense about it. Its enthusiastic supporters seemed to think that it would inaugurate in the world an age of universal peace. Swords were to be beaten into plough-shares and spears into pruning-hooks all the world over. Its enemies conjured up every sort of danger, from crowds of foreign refugees and a tumultuous concourse of uncontrollable mobs. As a fact, the Exhibition was a splendid success, seen by hundreds of thousands clad in universal smiles. As a fact also, alas! some of the most bloody wars in history have been waged since its opening, and now it would almost seem as if wars to secure commercial markets are to be as fierce as wars used to be for actual territory. The opening of that Exhibition was a sight never to be forgotten. It was by far the most beautiful spectacle I have ever seen—using the word beautiful in the strictest sense. There was nothing of the majesty, solemnity, and infinite pathos of the magnificent procession that escorted the Queen on her Jubilee in 1887 from Buckingham Palace to Westminster, and of the scene in the Abbey, when her people and the Princes of Europe did honour to a simple character and to an illustrious reign. But, merely as a spectacle of joy and of supreme beauty, the opening of the Great Exhibition of 1851 stands in my memory as a thing unapproachable and alone. This supreme beauty was mainly in the building, not in its contents, nor even in the brilliant and happy throng that filled it. The sight of it was a new sensation, as if Fancy had been suddenly unveiled. Nothing like it had ever been seen before—its lightsomeness, its loftiness, its interminable vistas, its aisles and domes of shining and brilliant colouring. Yet few knew that this setting for the great pageant, which lent it all its wonderful charm, was the product of a man of genius, who was discovered and brought forward by the Duke of Devonshire.

The Duke was very fond of horticulture, to which

he gave much time, and to which he devoted much of his ample fortune. It was he who introduced the cultivation of orchids, since so immensely popular, and I recollect once hearing a celebrated collector mourning over the Duke's death, as there was no one to take his place as a munificent patron of horticulture. There was a story current in his family that he was so engrossed by the discovery of a new species of orchid, called 'Dendrobium,' that, in absence of mind, he signed a letter 'Yours truly, Dendrobium,' instead of 'Devonshire.' One of the Duke's special gifts was well known to be an extraordinary sagacity in the perception of character, and in one case at least it bore good fruit. Walking one day in his gardens at Chiswick, he happened to notice the pruning of a plant on a wall, which was being done by a journeyman gardener mounted on a ladder. The Duke stopped to ask some question of the man, who gave an unusually intelligent reply, and showed a countenance which at once struck the Duke's penetrating eye as in the highest degree remarkable. He asked his name. It was Joseph Paxton, and from that moment the Duke took the man in hand. In no long time Paxton became head of the Chiswick gardens, and from Chiswick he was further promoted to be head gardener at Chatsworth. Under Paxton's inspiration, the Duke erected at that place an immense conservatory, on a scale greatly beyond anything then existing. It was a long, straight house, so lofty as to hold well-grown palms and other tropical vegetation. The erection was entirely of glass and wood, with a 'ridge-and-furrow' roof, the idea of which Paxton took from the structure of some leaf. Paxton was the life and soul of all the Duke's magnificent works at Chatsworth, especially of those undertaken in honour of an approaching visit from the Emperor Nicholas of Russia.

Paxton's name became celebrated all over the kingdom, and he was one of the prominent men whom

Prince Albert placed on the Royal Commission for the Great Exhibition of 1851. The site fixed for the purpose was on the fine level stretch of ground in Hyde Park, between Rotten Row and the drive to Kensington, but on the choice of this position there was an outbreak of furious opposition, and not unnaturally. The opposite householders would have been greatly damaged, and if the building was to be of brick or stone, it would have ruined one of the finest open spaces of the Park. Lord Campbell, Chief Justice of England, was one of the threatened householders. He was furious. Lord Brougham took part with his judicial brother, all the more eagerly that he had early associations adverse to the Court. A party was stirred up in the House of Commons, and it needed all the exertions of the leaders of both political parties to repulse the attack. But all this difficulty was solved by Joseph Paxton. He conceived the idea of a building neither of stone nor of brick, but of iron and glass alone. He suggested a gigantic conservatory. It was to be the Chatsworth conservatory glorified. It would be built with less labour, and was more sure to be removed than a more substantial building. But one objection to the site remained. It so happened that two of the finest old elm-trees in Hyde Park grew exactly in the centre of the proposed site—one close to the northern edge of it in Rotten Row, the other close to the southern edge of it in the Kensington Drive. The sacrifice of those trees was angrily deplored. But the genius of Paxton came to the front again. Why should those two fine trees be cut down? Why not enclose them in the building? Why should not the great central vaulted roof be thrown right over the top of those great trees, so that not a branch, or twig, or leaf of them should be touched? Nobody but Paxton would ever have thought of such a daring proposal. But when made, and when the contractors declared that they could execute this great design, it was joyfully accepted.

And thus arose one of the most curious and striking beauties of that wonderful building. It was cruciform—a long nave with a magnificent transept, and at the end of each arm of this transept was a great forest tree, in full foliage, with the glittering dome of glass arching high over its stately head. The procession at the opening was beautiful, but it was nothing to this magnificent and fairy-like building through which it filed. It was indeed a splendid triumph of the human imagination, and of the industrial resources of modern constructive skill. Other incidents threw in their contributions to the charm of the scene. The radiant happiness of the Queen in seeing the success of her husband's great idea was one of these. The universal and affectionate homage paid to the old Duke of Wellington as he passed was another. In seeing all other famous things, even the greatest—such as St. Peter's at Rome, or the Coliseum—I have always felt that I could conceive, and had conceived, them greater. But this building far transcended all expectation, an effect no doubt of its absolute novelty, as well as of its splendour in transparency and light.

During 1851 the Government of Lord John Russell was evidently tottering to its fall. The Peelites did all they could to support it, for the sake of keeping Lord Stanley out; but it was difficult. Parties were demoralized, and adverse divisions on particular questions placed the Government in occasional minorities. Lord John actually resigned, but no Government could be formed, and he came back with his whole crew. It was about this time that the first proposal of office was made to me. Lord John Russell made it through his colleague, Lord Carlisle, my wife's uncle. It was made in a very kind and complimentary letter, explaining that though the office he wished to place at my disposal was not a Cabinet one, yet in my case it would be practically at the 'door of the Cabinet.' Personally I felt as if this was almost a ridiculous

proposal, being very like an invitation to join his crew from the captain of a sinking ship; but, of course, I treated it seriously. I replied at once, in a very diplomatic letter, that I felt grateful for Lord John's kind appreciation, but pointed out that parties were then in a state of transition, and, as it was impossible at that moment to foresee how the future divisions or combinations might arise, I did not feel able to act alone in anticipating results under such very peculiar conditions. I mention the terms of this letter particularly, because they were in themselves a refutation of the clap-trap phrase 'Coalition' afterwards applied by Disraeli to his opponents when they did unite. There was no other possibility of a strong Government. The old Whigs alone had fallen into decrepitude, and were especially helpless in finance. The Peelites were equally incapable of standing alone. The Protectionists were very much in the same position, and were losing ground rapidly as a party with any hope of restoring a discredited fiscal system.

There is all the difference in the world between an unprincipled coalition of personal politicians long opposed and a union of parties between whom the divisions had disappeared, by the settlement of old questions and the rise of new questions on which they were not divided, but, on the contrary, were united. My letter to Lord John Russell was one indication out of a thousand others that a complete reconstruction of parties was then anticipated as a necessity, and that every man was expected to do his duty in promoting it. During the rest of 1851 attempts were continually being made by John Russell to lengthen his cords and to strengthen his stakes. Soundings were taken in all waters, and I doubt whether there was a single member of the Peelite group who did not receive, directly or indirectly, proposals, or at least inquiries, as to joining the Government. They were all founded on the assumption that Lord John must be the Prime

Minister, whereas there was among us all a growing feeling that his part had been nearly played out, and that some new head was wanted to give a fresh start to any effective combination of broken and disintegrated parties. None of us could then foresee the strange events which were so soon to precipitate a crisis and to make this alternative compulsory.

When the beautiful building of the Crystal Palace had ceased to engross conversation, we found ourselves all talking of two things—first, the tottering condition of our own Cabinet, and, secondly, the apparently inevitable approach of some new revolutionary change in France. Nobody believed for a moment in the stability of the Assemblies which assumed the rule of France when the Orleans dynasty had fled. The name of a republic was a mere temporary cover, under which internecine factions could hatch their conspiracies and bide their time. Legitimists, and Orleanists, and Bonapartists, and Socialists, and Red Republicans, were all plotting and intriguing; but when the French people, by an immense majority under universal suffrage, elected Louis Napoleon to be President, it was clear what this could only mean. He had no known abilities. He was a dreamer and a born conspirator. His election now by such a rush of voters could only mean a terror of revolution and a clutching at any name which could restore authority and found a lasting Government. The existing law might, and did, bind the President to the absurd constitution under which he was elected. But none of the contending factions ever dreamed of being bound by it themselves. They would, and they did, plot as they pleased. But he was to sit still with his hands folded, and to do nothing. Under these conditions, France was driving straight upon the rocks of anarchy. The British press almost universally recognised this to be the position of affairs, when suddenly the President, plotting against the plotters, and having both money and the masses behind him, struck his

decisive blow in the famous *coup d'état* of December 2, 1851.

The reactions of French politics upon the politics of England, although far less strong and direct than on the politics of the Continental nations, have nevertheless been well marked. The waves of the great French Revolution did indeed break in vain on our shores, thanks to the magnificent attitude of Pitt and to the loyalty of the people whose spirit he embodied. But they caused the Irish rebellion of 1798. The later French Revolution, which overthrew the dynasty of the elder Bourbons, had an undoubted effect in stimulating the Reform Movement in England which triumphed in 1832. The still later Revolution of 1848 had as yet done nothing to disturb us here. But now, suddenly, the man who had served as one of our special constables in London in that year was elected to the supreme Government of France, by a demonstration of popular favour which was indeed mysterious in its import, but was at least generally regarded in France as a vote against the anarchy of rival factions, every one of them revolutionary.

When the news of the Prince-President's *coup d'état* reached London, it had a curious effect on English society. We are so accustomed to a steady reign of order and of law that such unprincipled acts of violence shock us and disgust us. There was much in this particular example to accentuate such impressions. That one man, without the shadow of a legal right, should arrest in their beds some dozens of the most distinguished citizens of France, and should march them off to prison under the guard of a file of soldiers, seemed simply an act of coarse and brutal violence. The British press took this view at once, and the *Times* attacked the President daily in articles of great power and of still greater virulence. On the other hand, there were many—of whom I was one—who could not forget that such an idea as the duty of faithful allegiance to any form of Government had been long

destroyed in France by her repeated Revolutions, and had ceased to exist as an acknowledged moral obligation. They remembered, too, that the Prince-President was simply an arch-plotter amongst other plotters, and that the plebiscite in his favour gave him a plausible, and perhaps even a real, claim to regard his own authority as the one to which a great majority of the French people looked for deliverance.

I had soon a curious illustration of the wide contrast between the political and the journalistic mind in this storm of opinion. My wife and I had settled to join a large family party in spending the month of December, 1851, at Castle Howard, the beautiful place of Lord Carlisle, not far from York. The news of the *coup d'état* reached us on our journey, which we broke at York, in order to call on Canon William Harcourt, one of the most agreeable and distinguished among the many younger sons of the old Archbishop Harcourt. With Murchison, Sedgwick, De la Beche, and a few others, he was one of the original founders of the British Association for the Advancement of Science. The whole multitudinous offspring of Archbishop Harcourt were cousins of my wife. Cousinships are less considered in England than in Scotland; but even in England a congenial friend is somewhat more valued when he is a cousin, whilst less congenial cousins can be ignored. There was not very much communication between the Gowers and the Harcourts in my time, except with Canon William, to whom I took a great liking from the first moment I saw him. He seemed good, dignified, and wise, whilst his love of science and of literature gave interest to his conversation. At a date some years later than that I am now speaking of, when, by the death of his eldest brother George, William Harcourt had succeeded to the family estates, we visited him at the fine house, with the stately groves which look down at Nuneham over rich meadows upon shining reaches of the Thames close to Oxford. On this occasion, in the end of 1851, we found him in

the house attached to his canonry under the shadow of York Minster. There he introduced to us a new cousin, his son, also William, who had just come from London—now the far-famed and redoubtable party leader, Sir William Harcourt.* A tall, handsome youth, full of fire and fury on the subject of the *coup d'état*, against which he was reputed to be one of the fulminators in the press, he was then very much what he has continued to be—able, voluble, unrestrained, and vehement. Of course we talked of what everybody else was talking of at the moment. It was at once apparent that the venerable Canon did not at all sympathize with the violent interpretation of his son, and the contrast was instructive between the unmeasured and undisciplined views of the young journalist and the calmer judgment of the old philosopher.

From York we proceeded to Castle Howard, and it was in the midst of our quiet enjoyment of that fine place, of that still finer house, and, best of all, of the charming society it contained, that we found ourselves confronted again in a new form with that sharp antagonism of opinion on French politics which we had seen so acute between Canon William Harcourt and his son. Our host, Lord Carlisle, was suddenly summoned to a Cabinet in London, and soon after we heard that Lord John Russell had summarily dismissed Lord Palmerston from the Foreign Office. The cause assigned was that Palmerston, in conversation with the French Ambassador, Walewski, had expressed a decided sympathy with the Prince-President, if not actual approval of his action. This was undoubtedly an unguarded thing to do. It committed the British Government and the Crown to an opinion which had never received any sanction from the Cabinet. Palmerston, when called upon for an explanation, could give none that was satisfactory, and

* Died October 1, 1904.

Lord John at once called upon him to resign the seals of the Foreign Office. There was one circumstance about this crisis in domestic politics which excited special interest at Castle Howard: it was the choice made by Lord John Russell of a successor to Palmerston. That choice fell upon Lord Granville, who was the nephew of old Lady Carlisle. It was not without some amusement that I saw myself, so far as both relationship and friendship was concerned, becoming more and more intimately associated with the Whig Ministry. The appointment was not without some alloy to the family at Castle Howard. It placed Granville at a bound in an office high in importance above any which his cousin, Lord Carlisle, had ever held, whilst Lord Carlisle had long held a much more prominent place in general consideration. In speaking, Lord Carlisle was a considerable orator, whilst his long tenure of the seat for the West Riding of Yorkshire had marked him as one of the most prominent members of the House of Commons. He had been for some years in the Cabinet. It was therefore not an altogether agreeable surprise to see himself passed over as regarded the most important office in the Cabinet short of that of Prime Minister. But there were reasons—sound, yet rather indefinable—which accounted for and entirely justified Lord John Russell's decision in favour of Granville. He was popular in society, not merely on account of his very agreeable powers of conversation, but for his great good-temper, tact, and sagacity of character, and for other qualities, in short, which it was more easy to feel than to describe. The general impression of ability he produced among all who knew him had begun to spread among his opponents in politics, as well as among his friends. I very well recollect that, some years before this date, Granville had to answer some question in the Lords on behalf of the Government. This he did with a discretion and in a manner which attracted the long-experienced eye

of Lord Aberdeen, who turned to me when Granville sat down, and said: 'I think this is the best man they've got.' At this time I wrote a letter to Lord Aberdeen, a portion of which I insert here :

'As to Palmerston, I have heard since I wrote to you the version which I must presume to be his, from the source from which it came to me; and if it be quite correct, it does seem that he has been rather sharply treated by his colleagues.

'When the French Minister called on 2nd December—before any of the shooting affairs or the other more violent acts were known—he explained the position of the President of France in such a way that Lord Palmerston was induced to say (in a private and unofficial interview) "that the condition and danger of the President being such as described, it seemed to him that he was justified, on the principle of self-defence." I am authentically informed that this was the utmost extent of the words used—words only, and that nothing more passed. If this be so, it seems clear that no sufficient ground was given, by this alone, for such an abrupt dismissal by his colleagues, and we can only suppose that, as you say, it was but "the drop which made the cup overflow." Still, as they have hitherto upheld him in more dangerous pranks, explanation under these circumstances will not be easy.

'Granville was clearly the best man.

'I see that the Palmerston party—including some very good Conservatives—are furious about the Foreign Office affair, from a suspicion of undue influence in a quarter represented by the Court. But this seems to me great nonsense. There, as elsewhere, I doubt not, great dissatisfaction was felt at Lord Palmerston's conduct, and satisfaction at his dismissal.'

I here allude to the first indication of unjustifiable feeling against the Prince Consort which soon rose to a storm. The Queen has since sanctioned the publication of documents which fully confirm the conjectures expressed in the above letter—that Palmerston's course of conduct for a long time towards his Sovereign and his own colleagues had become intolerable—and we now know that the Queen had long been of opinion

that it ought not to be submitted to. The explanations given in Parliament by Lord John Russell on this subject threw a new light on the constitutional rights of the Crown. One of these was, to be kept in full and timely knowledge of every important step to be taken by the Ministers, so that the personal mind of the Sovereign might be expressed and duly weighed by the Cabinet.

It was in May, 1852, that I first appeared as an author on a scientific subject, in a paper communicated to the Geological Society of London on certain new fossil leaves I had found in the Isle of Mull. It is not often that a beginner in any science makes in it a discovery of considerable importance. Yet such was my good fortune in the present case, and the circumstances are curious. My special tastes and reading had always been directed to the biological branches of natural science, and especially to ornithology. During my boyhood geology was only being gradually built up in England by Lyell, Murchison, and Sedgwick. I well recollect hearing an old friend of my father—a certain George Peter Irvine—telling him at Ardencaple that he had a friend in the army who used to be an excellent fellow and a most agreeable comrade, but who now thought and spoke only of something that he called ‘the Silurian System.’ The tone of scorn and ridicule with which this new and apparently pompous title was pronounced remains to this day engraven on my memory. Otherwise, however, I heard nothing of geology in those early years, except in connection with a favourite pursuit of my father’s intimate friend Smith of Jordanhill. That pursuit was conchology, the collecting of marine shells, both living and dead—the living shells by dredging in his yacht, the dead by collecting all he could get from the beds of clay to be found along the shores, and often considerably above the existing shores, within the limits of the ‘old coast-line,’ which is a conspicuous feature in the estuary of the Clyde.

To this pursuit he was introduced accidentally by my father, then Lord John Campbell. He was erecting a saw-mill in 1835, and was digging the foundation at the bottom of the steep bank which marks the old coast-line. The excavation uncovered a mass of stiff blue clay, in which a good many sea-shells were found. My father noticed the fact as interesting, and directed to it the attention of his friend Jordanhill. He took it up at once, and pursued the investigations systematically. Smith soon began to observe that, among the shells found in the lower beds of clay which had been left upon an older sea-line, there were many different from any now to be found in the adjacent waters ; and, further, he observed that several of these older shells were of a species now living in the Arctic regions. Once set upon this scent, he pursued it to its only legitimate and necessary conclusion—that the sea which washed the shores of the West of Scotland in the ages when it stood from 50 to 60 feet lower than it does now must have been a sea existing under conditions of Arctic cold. This result he communicated to the scientific societies so early as 1839, fortified by a long and conclusive series of observations and of specimens. Smith of Jordanhill was therefore the real founder of the Glacial Theory, which has played so great a part in recent geology. It is commonly assigned to Agassiz, but he did not visit this country till 1840, and his arguments were open to dispute. Smith had prepared the way for whatever success Agassiz had in pointing to the agency of ice as that which would alone account for certain markings and mechanical effects visible on our rock surfaces.

Of course, Agassiz's reasoning on the cause of these mechanical effects was in a moment rendered easy of acceptance when it fitted in so completely with the zoological fact, otherwise and previously ascertained, that a glacial molluscous fauna had lived and flourished in our seas at a time so comparatively recent. The claim of Smith of Jordanhill to priority in this dis-

covery is admitted by all authorities on the history of geological knowledge. Much, indeed, has been discovered, and much more has been imagined, since his time in respect to the Glacial Age. No part, however, of the science has been more cumbered with fads and faddists, and I question whether any one fact has been as yet so clearly proved as that which he established—namely, the occurrence in very recent geological times of a cold and glacial, but a quiet and tranquil, sea, which endured so long on our coasts that it had time to cut out a broad and well-marked terrace on which a peculiar assemblage of shell-fish, now common in Iceland, lived and died on deposits of mud and clay, which are now often many feet above the highest tide, but have never been broken or disturbed.

Although as a lad I had often heard Smith talking on the subject, and had seen his enthusiastic search for new shells, I had never myself taken further notice of geology, nor had I picked up its bearings on natural problems of the greatest curiosity and interest. All that I had heard lay in my mind embedded and covered up by other material, like seeds in the ground which are dormant, but ready to germinate when favourable conditions come. I had always eyes wide, but ignorantly, open to the observation of everything in external nature, and I always had a vague sense of the innumerable problems which they suggest, but about 1851 I had taken to reading about geology more or less. In that year my wife and I made one of our usual visits to the estates in Mull, and lived some little time at the village of Bunessan. Though not in itself a beautiful spot, its surroundings are both beautiful and magnificent, particularly the great headland of Bourg, 1,600 feet high, in which the volcanic ranges of Ben More terminate precipitously in the sea. One day the leading shopkeeper in the village, an intelligent man of the name of McDiarmid, told me that in climbing down a ravine in the rocks near the mouth of Loch Laigh, at the head of which Bunessan is

situated, he had taken hold of a projecting ledge of stone, which had broken off with his weight, and on the slice of it which remained in his hand he was surprised to see what seemed to be the impression of a leaf of a tree. At my request he brought it to me, and I was greatly surprised to see the most beautifully-preserved impression of a very large forest leaf, apparently that of a sycamore or of a platanus. The venation was all preserved, and I could detect even some remains of the substance of the leaf in a delicate pellicle of vegetable matter. I at once asked McDiarmid to go to the place and bring me some larger specimens. This was now done, and my surprise was much increased to find that large blocks of stone were almost entirely composed of a mass of vegetable leaves of all sorts and kinds. The platanus was most conspicuous; but there were quantities of equisetum, or 'mare's tails,' of yew, of leaves like that of the alder, of the rose, and of many others. In short, it gave me the idea of a hardened mud crammed full of a forest vegetation which had fallen year after year into some still pool or back-water, and which had thus become matted with the rotten foliage. Associated with the bed of leaves there were two other beds, well marked and distinct, one below and the other above the leaf-bed, consisting in the upper one of a pudding-stone of chalk flints, which had the aspect of having been burnt, and in the lower one of what looked like the ashes of a volcano, mixed with fragments of indurated chalk. The whole series was capped on the surface by a thick bed of basaltic rock, while the beds themselves rested on the top of a high precipice of columnar basalt, with pillars as regular and perfect as those of Staffa, which was only six miles away.

I did not then know, nor, indeed, do I now know, all the inferences to be drawn from those embedded leaves, because they suggest many questions which I have never yet seen solved; but I saw enough to



BOUEG HEADLAND, MULL: ARDTUN HEAD LEAF BEDS.

From a picture by the Duke of Argyll.

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rouse my curiosity thoroughly. I sent off specimens to Sir Henry de la Beche, whom I had known when he was founding the Museum of Practical Geology in Craig's Court, which afterwards attained such a splendid development in the institution in Jermyn Street. On going to London in the spring of 1852, I saw him, and after questioning me whether the leaves were certainly underneath the basalt, and my telling him I was quite sure of that, he at once told me I had 'made a very pretty point,' and advised me to make it the subject of a public paper. My dear old friend Smith of Jordanhill, whose early affection for my father and mother overflowed upon me as long as he lived, was highly delighted by my discovery. He went off to Mull as soon as he could in his yacht, and with the apparatus of ropes and fathom-lines available from her, he made a careful measurement of the whole precipice and of each and all of the beds. These data he supplied to me, and my paper was published in the *Journal of the Geological Society of London* for May, 1852. This is not the place to enter on any details as to the significance in science of the discovery of the Ardtun leaf-beds. Suffice it to say that for the first time it indicated the geological age of the enormous prolonged volcanic outbursts which have covered with lava a vast area of country, extending from Antrim in Ireland to the Faroe Islands in the North Sea. It proved those outbursts to have been not submarine, but subaerial—that is to say, they were outbursts through and upon old surfaces of land, where a splendid vegetation had had quiet intervals of time to begin to flourish and to accumulate, until they were again overwhelmed by fresh outbursts of volcanic violence. No other spot in the whole of that great area of broken fragments of an ancient land had furnished anything like the evidence to this effect which is so beautifully preserved at Ardtun. I must confess, too, that at the time and ever since I have been filled with the most profound scepticism regarding the extreme

doctrine of uniformity in the agencies of change, which became popular, if not established, under the old teaching of Hutton, and was systematized and argued with great ability by my friend Sir Charles Lyell.

Whilst the physical sciences in one of their branches were thus exercising their old attraction over me, I was, during those years, reading a good deal and thinking a good deal more on questions of philosophy. In particular I read Bishop Butler with care, having only slightly looked into him before. Dry and difficult as I thought his style, I found it gained upon me, chiefly from one feature—namely, its conspicuous and careful self-restraint—so that in questions above all others the most difficult, one never had the fear of being entrapped into unsound conclusions by the undue influence of enthusiasm or of fancy. But, beyond this unspeakable merit in a philosophical writer, I drank in as a cardinal truth the one great idea—that if a Divine Being is the Author both of Nature and of every higher revelation of Himself, it is sure to happen that the same difficulties which arise in the one sphere will more or less be felt, at least by analogy, in the other. This lies at the root of all Butler's teaching. It was cognate with much that had been impressed upon my own mind as a boy in the study of animal mechanics, in which, as it seemed to me, the proofs of a living and understanding author were direct and immediate, yet so easily ignored and even so angrily denied. The more I thought of it, the sounder did Butler's fundamental conception of an analogy appear to me to be. I knew, indeed, that the particular objections against religion which he dealt with in his time were not the same as those most common at a later date, but I knew also that the more modern views of the same tendency were connected with the interpretations and suggestions which arose out of the progress of the physical sciences since Butler's time, and I could not doubt that if this fundamental principle was as

sound as it seemed to me to be, it would be found as applicable to all that we can know of Nature now as to all that was known of Nature then. I know, indeed, that a new school has arisen which affects to treat Butler with contempt, but I observe that it is a school which is blind to the power of analogy in all the operations of the mind, to the place it takes and the part it plays in everything that we can understand, as an explanation of anything in the world.

It was at a time when my mind had come to be a good deal occupied with these subjects that the University of St. Andrews, the most ancient in Scotland, did me the honour of electing me as its Chancellor—an honour all the greater as I had no local connection with the East of Scotland. I found it was expected that I should deliver an address to the students at the ceremony of my installation. This I accordingly did on March 25, 1852. It was entirely successful, so far as regarded the close attention of the audience, which included all the professors of the University and a number of old 'Alumni.' The criticism passed upon it at the time by some was that it was too theological. It would have been great affectation in me if I had made it classical; and, as the tendency of the Scottish mind is much more philosophical than classical, I thought it best to speak on that subject on which I had thought the most, and on which my address was most likely to be of use. It was in this address that I foreshadowed much of my own future intellectual work in one sentence, when I said that an endeavour to bring the great argument of Butler abreast of the science of the present time ought to be the labour of our day.

In the autumn of this year, 1852, my wife and I spent some time in one of our frequent visits to the Sutherlands at Dunrobin. Besides fishing and some shooting, I passed one most interesting day in geologizing on the seashore at Helmsdale. To my surprise, I found the shore covered with fossilized wood and

with shales, in one of which I detected the tail of a fossil fish, apparently of what is called the homocercal type. The lumps of fossil wood were so abundant that I could have easily filled a cart, and it was to me curious to observe that the aspect of wood and fibre was so entirely unchanged by conversion into the mineral substance of a silicious limestone that the most inexperienced eye could not fail to detect it at once. One specimen I found which interested me greatly, from the measure it presented of the epochs of geological time. It was the root of one of the trees whose branches afforded the quantities of fossil wood all around. This root had been growing on the shales which were the subsoil of those old forests, and it had grasped with so firm a hold some layers of stone that when the tree was uprooted by winds or floods, its roots had carried away portions of the rock with it. I picked out one of these bits of sandy shale, and on handling it, I observed that it contained in it one scale of a ganoid fish, like those belonging to the old red fishes so common in the flagstones of Caithness. That scale told a tale indeed. It had belonged to a fish that swam in the old red seas or lakes. The mud of that sea had been converted into stone. It had been then elevated into dry land. It had next supported a fine forest of Araucarian pines. These, again, had been destroyed and submerged and fossilized. But the root had never let go its grip upon the rock on which it had stood, which told of a much older world, as compared with which the now long-vanished Araucarians were young indeed.

Before leaving the North of Scotland I paid a visit to the little town of Cromarty, the residence at that time of the celebrated Hugh Miller, whose geological and literary works had so lately astonished and charmed the world. He received me very kindly, showed me over his collection of fossils, and presented me with a fine specimen of one of those

'ichthyolite' nodules which he had so vividly described in his admirable book on 'The Old Red Sandstone.' This specimen I still carefully preserve and highly value, as one of classic interest in the history of science. It was a great delight and interest to me to see and have some conversation with this remarkable man. I had been much fascinated by his work on 'The Old Red Sandstone'—the first book I ever read which cast the light and the charm of poetry on the dry paths of science. I had heard the most learned writers—men who were students and professors in the universities—declare that they would give their ears to be able to write as this new author wrote on the lessons of geology. And yet he was reported to be an ordinary working-man—an operative mason, whose youth had been spent in building walls and laying mortar, and in cutting stones with chisel and mallet in his hands. I was immensely curious to see him, and my curiosity was well repaid.

Hugh Miller continued to be in outward aspect exactly what he had always been—a working-man—without a trace of social culture in his manners or appearance. He had, indeed, a low and gentle voice, which sounded shy, but his accent was unlike that of an educated man. His expression was more than thoughtful—it was very grave, meditative, and abstracted; but I saw in a moment the secret of his being. He had an enormous head, made still larger in appearance by a huge shock of unkempt hair, which hung over his brows and eyes. There have been only four men whom I have come across in life who have had the enormous brain-case which was conspicuous in Hugh Miller. One was Dr. Thomas Chalmers; another was Sir James Simpson; the third was Hugh Miller; and the fourth was Professor Whewell, Master of Trinity, and author of the 'History of the Inductive Sciences.' These were all men of more than what we call ability—they were all men of genius. With such a brain nothing is impossible, provided only it be fur-

nished with a very few simple tools. We are too apt to forget how admirably such tools have been fashioned and put into the hands of the humblest classes in Scotland in her parochial schools. If a scholar from one of these schools was guided by his own inborn tastes and instincts to spend his spare time in solid and substantial reading, instead of devouring trash, it is easy to understand how quickly he might climb the ladder. Hugh Miller was one of those who was thus led to feed upon a few good books, such as were common in his youth. This it is which explains the fact that when Robert Burns, the ploughman poet, began to correspond, his earliest letters were those of an educated gentleman. So when Hugh Miller took a walking tour through England, he produced another charming book, which shows that he had been long familiar with not a few of the classic authors of English literature. He made pilgrimages to the homes of great authors, and trod on the walks of Hume, on the paths of Olney and the Leasowes.* As to style, Hugh Miller's writings are a signal proof how little may be due to any example, still less to any imitation.

Dr. Johnson has said that whoever would desire to have a polished English style 'must give his days and his nights to the pages of Addison.' I venture to think that this is nonsense. Hugh Miller's English is quite as good as Addison's, and far more full of thought and of charm. It is the brain that makes style in writing, just as it is the brain that makes the harmonies of line and colour in painting, and of sound and sense in poetry. In speaking to Hugh Miller, I felt that I was speaking to a born genius, and the roughness of the setting seemed to me only to set off more distinctly the native brilliance of the gem. It was a sad misfortune for Hugh Miller, for science, and for Scotland, when the managers of the Free Church chained him to the galley-oar by appointing

* The home of Shenstone.

him editor of a mere party newspaper. This was not work for him. He felt the strain, and spoke of the constant work of cutting shavings off his brain as a burden and a waste. It helped to break him down, until one of the finest minds which Scotland has produced in my time fell into the shadows of mental distress and into the catastrophe of self-destruction.