

of the Scriptures, they would find it coincide on every important point. The excavations at Chaldea furnished them with inscriptions showing the names of kings, their parentage, the gods they worshipped, the temples they built, the cities they founded, and many other particulars of their reign. He then mentioned some circumstances with reference to the mound at Birs-Nimroud, which he had recently uncovered, and which he found laid out in the form of seven terraces. These were arranged in the order in which the Caldeans or Sabeans supposed the planetary spheres were arranged, and each terrace being painted in different colours, in order to represent its respective planet. Another curious circumstance with reference to this excavation was the discovery of documents enclosed in this temple. From the appearance of the place, he was enabled at once to say in what part they were placed, and on opening the wall at the place he indicated, his workmen found two fine cylinders. He also mentioned another small ivory cylinder which he had discovered, and round which were engraved mathematical figures, so small that they could hardly be seen with the naked eye, and which could not have been engraved without the aid of a very strong lens. In concluding, he said that before the British Association met next year, he hoped to be able to bring before them the decipherment of several highly important inscriptions.

*On the less-known Fossil Floras of Scotland*, by Mr. HUGH MILLER. —Scotland has its four fossil Floras: its Flora of the Old Red Sandstone, its carboniferous Flora, its oolitic Flora, and that Flora of apparently tertiary age, of which His Grace the Duke of Argyll found so interesting a fragment, overlown by the thick basalt beds and trap tufts of Mull. Of these, the only one adequately known to the geologist is the gorgeous Flora of the coal-measures, probably the richest, in at least individual plants, which the world has yet seen. The others are all but wholly unknown; and the Association may be the more disposed to tolerate the comparative meagreness of the few brief remarks which I propose making on two of their number—the Floras of the Old Red Sandstone and the oolite—from the consideration that the meagreness is only too truly representative of the present state of our knowledge regarding them, and that if my descriptions be scanty and inadequate, it is only because the facts are still few. How much of the lost may yet be recovered I know not; but the circumstances that two great Floras—remote predecessors of the existing one—that once covered with their continuous mantle of green the dry land of what is now Scotland, should be represented but by a few coniferous fossils, a few cycadaceous fronds, a few ferns and club mosses, must serve to show what mere fragments of the past history of our country we have yet been able to recover from the rocks, and how very much in the work of exploration and discovery still remains for us to do. We stand on the further edge of the great Floras of by-past creations, and have gathered but a few handfuls of faded leaves, a few broken branches, a few decayed cones. The Silurian deposits of our country have not yet furnished us with any unequivocal traces of a terrestrial vegetation. Prof. Nicol, of Aberdeen, on subjecting to the microscope the ashes of a silurian anthracite which occurs in Peebles-shire, detected in it minute tubular fibres, which seem, he says, to indicate a higher class of vegetation than the algae; but these may have belonged to a marine vegetation notwithstanding. Associated with the earliest ichthyic remains of the Old Red Sandstone, we find vegetable organisms in such abundance, that they communicate often a fissile character to the stone in which they occur. But, existing as mere carbonaceous markings, their state of keeping is usually so bad, that they tell us little else than that the antequely-formed fishes of this remote period had swam over sea-bottoms darkened by forests of algae. The immensely developed flagstones of Caithness seem to owe their dark colour to organic matter, mainly of vegetable origin. So strongly bituminous, indeed, are some of the beds of dingier tint, that they flame in the fire like slates steeped in oil. The remains of terrestrial vegetation in this deposit are greatly scantier than those of its marine Flora; but they must be regarded as possessing a peculiar interest, as the oldest of their class in, at least, the British Islands, whose true place in the scale can be satisfactorily established. In the flagstones of Orkney there occurs, though very rarely, a minute vegetable organism, which I have elsewhere described as having much the appearance of one of our smaller ferns, such as the maidenhair spleenwort or dwarf moonwort. But the vegetable organism of the formation, indicative of the highest rank of any yet found in it, is a true wood of the cone-bearing order. I laid open the nodule which contains this specimen, in one of the ichthyolite beds of Cromarty, rather more than eighteen years ago; but, though I described it, in the first edition of a little work on 'The Old Red Sandstone' in 1841, as exhibiting the woody fibre, it was not until 1845 that, with the assistance of the op-

tical lapidary, I subjected its structure to the test of the microscope. It turned out, as I anticipated, to be the portion of a tree; and on my submitting the prepared specimen to one of our highest authorities, the late Mr. William Nicol, he at once decided that the "reticulated texture of the transverse section, though somewhat compressed, clearly indicated a coniferous origin." I may add, that this most ancient of Scottish lignites presented several peculiarities of structure. Like some of the Araucarians of the warmer latitudes, it exhibits no lines of yearly growth: its medullary rays are slender, and comparatively inconspicuous; and the discs which mottle the sides of its sap chambers, when viewed in the longitudinal section, are exceedingly minute, and are ranged, so far as can be judged in their imperfect state of keeping, in the alternate order peculiar to the Araucarians. On what perished land of the early Palaeozoic ages did this venerably antique tree cast root and flourish, when the extinct genera *Pterichthys* and *Cocosteus* were enjoying life by millions in the surrounding seas—long ere the Flora or Fauna of the coal measures had begun to be? The Caithness flagstones have furnished one vegetable organism apparently higher in the scale than those just described, in a well-marked specimen of *Lepidodendron*, which exhibits like the Araucarian of the Lower Old Red, though less distinctly, the internal structure. It was found about sixteen years ago in a pavement quarry near Clockbriggs—the last station on the Aberdeen and Forfar railway—as the traveller approaches the latter place from the north. Above this grey flagstone formation lies the Upper Old Red Sandstone, with its peculiar group of ichthyic organisms, none of which seem specifically identical with those of either the Caithness or the Forfarshire beds; for it is an interesting circumstance, suggestive surely of the vast periods which must have elapsed during its deposition, that the great Old Red system had its three distinct platforms of organic existence, each wholly different from the others. Generically and in the group, however, the Upper fishes much more closely resemble the fishes of the Lower, or Caithness and Cromarty platform, than they do those of the Forfarshire and Kincardine one. In the uppermost beds of the Upper Old Red formation in Scotland, which are usually of a pale or light yellow colour, the vegetable remains again become strongly carbonaceous, but their state of preservation continues bad—too bad to admit of their determination of either species or genera; and not until we rise a very little beyond the system do we find the remains of a Flora either rich or well preserved. But very remarkable is the change which at this stage at once occurs. We pass at a single stride from great poverty to great wealth. The suddenness of the change seems suited to remind one of that experienced by the voyager when, after traversing for many days some wide expanse of ocean, unvaried save by its banks of floating sea-weed, or where, occasionally and at wide intervals, he picks up some leaf-bearing bough, or marks some fragment of drift-weed go floating past, he enters at length the sheltered lagoon of some coral island, and sees all around the deep green of a tropical vegetation descending in tangled luxuriance to the water's edge—tall, erect ferns, and creeping *Lycopodaceæ*; and the pandanus, with its aerial roots and its screw-like clusters of narrow leaves; and high over all, tall palms, with their huge pinnate fronds, and their curiously aggregated groups of massive fruit. In this noble Flora of the coal-measures much still remains to be done in Scotland. Our Lower Carboniferous rocks are of immense development; the limestones of Burdie House, with their numerous terrestrial plants, occur many hundred feet beneath our mountain limestones; and our list of vegetable species peculiar to these lower deposits is still very incomplete. Even in those higher carboniferous rocks with which the many coal workings of the country have rendered us comparatively familiar, there seems to be still a good deal of the new and the unknown to repay the labour of future explorers. It was only last year that Mr. Gourlie, of this city, added to our fossil Flora a new *Volkmannia* from the coal-field of Carluke; and I detected very recently in a neighbouring locality, though in but an indifferent state of keeping, what seems to be a new and very peculiar fern. There is a *Stigmara*, too, on the table, very ornate in its sculpture, of which I have now found three specimens in a quarry of the coal-measures near Portobello, that has still to be figured and described. In this richly-ornamented *Stigmara* the characteristic *arcolæ* present the ordinary aspect; each, however, forms the centre of a sculptured star, consisting of from eighteen to twenty rays, or rather the centre of a sculptured flower of the Composite order, resembling a garden daisy. The minute petals—if we are to accept the latter comparison—are ranged in three concentric lines, and their form is irregularly lenticular. Even among the vegetable organisms already partially described and figured, much remains to be accomplished in the way of restoration. The detached