

outlines have first been traced by igneous powers, in lines undoubtedly often so faint that they may have been scarcely perceptible, always rough and imperfect. These lines the denuding agencies have in some cases enlarged, in some lessened, in all smoothed down or otherways so altered, that the original tracings are all but lost in the finished picture.

And in this we have a beautiful instance of the mode in which the all-powerful Creator causes the many agencies by which He accomplishes the great schemes of nature, to work together in harmony for the general well-being of His universe.

---

*Thursday, 16th April 1868.*

Dr PAGE, President, in the Chair.

The following Communications were read:—

- I. *Observations on the Miocene Beds of Greenland.* By ROBERT BROWN, F.R.G.S., Foreign Corresponding Fellow of the Society. Communicated by JAMES HASWELL, M.A.

[The following observations are contained in a letter which I received from Mr Brown in December last. He says—]

“ We brought home—that is to say, my companion Mr Edward Whympster (brother of my old travelling friend Mr F. Whympster, a Foreign Member of your Society) and myself, under my direction—an immense load of specimens—leaves, fruits, twigs, and possibly a cone of some coniferous tree—principally from Atanakerdluk (lat. 70° 02' 30" N.), Kudlesæt, and Ounartok, all localities in the Waigatz Straits, on the Noursak Peninsula and Disco Island, where alone in all Greenland Miocene strata have been found. Extending over a very limited district, these strata are composed of a great variety of beds of sandstone, alternating with lignitic coal, and topped by shales of various descriptions. In all the sandstones and shales (with the exception of the coarse grits) I found more or less of vegetable impressions, but it was only in the thin layers of a hard clay slate impregnated with iron that they retained their impressions very distinctly. All these strata were cut across by trap-dykes, in some places standing out bare and wall-like from the denuded softer strata through which they had protruded. In other places the trap was interstratified with the sedimentary rocks, and in others again it stood out in bold basaltic (amorphous) headlands or skerries in the sea, from which circumstance, indeed, the principal fossil locality, At-ān-āk-ērd-lūk ('the rocks in the sea'), gets its name.

"The stems I found at Kudlesæt, in lat. (by my observations, August 26, 1867)  $70^{\circ} 05' 35''$  N., *wholly imbedded in coal in a horizontal position*. The beds of coal there were about 2 or 3 feet in thickness, and the stems were on an average 2 feet in diameter.

"The fossil leaves were very perfect, even to the venation and serration, and undoubtedly never were *floated* there by water, but most probably grew *near* the spot (as has been supposed, theoretically, by Professor Heer of Zurich), but yet I cannot aver that *in any instance* did I find the leaves in *conjunction with* or *attached to* the stem, by which I could positively say that these were the leaves of the tree to which the stem belonged, or that the stem was brought there, or was in any way connected with the same natural or physical causes which influenced the leaves. Indeed, on my last visit to Copenhagen, on the question being stated to Professor Steenstrup, one of the most acute of all the Scandinavian naturalists, that eminent biologist immediately said, 'Perhaps they were blown by the wind to their present locality.'

"Of course, our collection is not the first specimens of this miocene flora which have reached Europe, though I am the first naturalist who ever examined the beds, collected the plants personally, or thought over the subject *with the locality before him*. Dr Heinrich Rink is generally supposed to be the discoverer of these beds; and in his valuable work, 'Grönland Geographisk og Statistisk beskrevet' (Kjöbenhavn, 1857), gave the first inkling of the existence of these strata; but he only passed the locality hastily, nor seemed he to be aware of the importance of the discovery, for he only mentions one plant, *Pinites Rinkiana*. Since then various odd specimens, brought in as curiosities by the Eskimo, or picked up by sailors or Danish officers in the same light, have reached England and the Continent, on which Dr Oswald Heer, Professor of Botany in Zurich, made a vast number of species (amounting already to more than one hundred species and genera, so called). [See his Paper in the 'Journal of the Royal Dublin Society,' 1866.] He is now engaged in incorporating all the Arctic fossil plants from Melville Island, the M'Kenzie River, &c., into a large work on the Arctic Fossil Flora,\* of which I have seen some of the proofs of the plates, and our collections have all gone to him for the same purpose. Now, although no one can value Professor Heer's qualifications for the task he has undertaken, or the utility of his proposed work, or of his other publications on the Tertiary flora of Europe, more than I do, yet I must, at this early period, emphatically, as an humble student of trees, shrubs, and plants in many parts of the world, and the only botanist who has

\* *Flora fossilis Artica*—since published.

visited the Greenland Tertiaries, and with all diffidence and modesty, protest against the way in which Professor Heer has been making species and genera out of these fossils, with a recklessness regardless of consequences. But in the making of species and genera out of slender characteristics, he perhaps does not stand alone; and I am glad that Mr W. Carruthers is doing the *synthetic* to other botanists' *analytic* subdivision of fossil species. It is well known that serration on the leaf, or want of serration, is no character by which to form a species or erect a new genus, as the same individual plant will have leaves serrated and plain, and leaves of entirely different form; besides, the stipular and radical leaves of many plants are totally different.

"The characters by which Professor Heer separates some of these fossil plants from recent species, such as *Sequoia Landsdorffii* from *Sequoia sempervirens* of California, are equally unfounded. I also happen to know that the locality from which the plants he first had were taken is not bigger than an ordinary sized room, and to have such a large number of species growing in that space, bespeaks not a temperate climate like that of Alta California, to which he compares it, but a tropical one like Central America, with both of which regions I am not unacquainted. . . .

"The most I could positively say about these plants is that they belonged to such and such an order and family, in some instances to such a like living genus, and in a few cases to such another living species, or has apparently good characters to separate it from any at present known to exist in a recent state. I defy any botanist to describe the *species* of the leaf-beds of the Isle of Wight, or even of Mull; and I know that only the other day a very eminent botanist declined working at the former for the same reasons that have induced me to pass those strictures on Professor Heer's work."

## II. *Brief Notes on the Precious Stones and Pearls of Scotland.*

By ALEX. M. COCKBURN.

Sir David Lindsay has recounted some of the advantages of Scotland in these terms—"Of ever ilk mettell we have the rich mynis, baith gold, silver, and *stones precious*." What these precious "stones" or gems of Scotland were he does not specify, and it will be the object of the following notes to give some account of those gems that are best known in Scotland. It may be taken for granted that diamonds, emeralds, sapphires, and rubies have never been found in Scotland; but that does not preclude the belief or possibility of their being discovered. Although poor in the more precious gems, yet Scotland can