series, and cannot be divided by an unconformity. That this assumption is unwarranted has again and again been proved. The break at the base of the Llandovery alluded to by our authors is, both in Shropshire and at Llandovery, between rocks of very similar character; and such is the case, it is generally stated, between the upper and lower parts of the Old Red Sandstone in Herefordshire, and between the Elgin and the Old Red Sandstone in Scotland. In most of these cases the separation is effected by the aid of the fossils, but in the present case stratigraphy has to do the work alone, and it is perfectly capable of doing it.

I trust that in the above remarks I may in no case have made a statement without at the same time indicating plainly how it may be checked, nor quoted my own opinion without giving any reasons for it, both of which procedures I hold to be inconsistent with scientific argument.

NOTICES OF MEMOIRS.

I.—Herstellung von Diamanten in Silikaten, entsprechend dem natürlichen Vorkommen in Kaplande. Vortrag gehalten im Verein zur Beförderung des Gewerbfleisses am 7 Februar, 1898, von I. Friedländer. (Berlin, 1898.)

(Artificial Production of Diamond in Silicates, corresponding to the Actual Mode of Occurrence in South Africa.)

IN the recent diamond-making experiments of M. Moissan, fused iron rich in carbon was allowed to cool in such a way that the separation of the excess of carbon took place under pressure, and it was thought that a high pressure was necessary to the success which had been attained. It is now known that the necessary pressure is not very high, for microscopic diamonds have been found as normal constituents of ordinary cast iron. In South Africa no iron is present in the metallic state in the diamond-bearing rock, although it is largely present as a chemical constituent of the stony matter. Hence, in regarding Moissan's method as being possibly identical with the one by which the South African diamonds had been formed, it was necessary to surmise that the crystals, after formation in the molten iron at some great depth below the earth's surface, had floated into the molten silicate-material above. It was, however, soon pointed out that the diamond-bearing rock, if in a state of fusion at small pressure, dissolves any diamonds contained in it.

Dr. Friedländer fused a small piece of olivine, a centimetre in diameter, by means of a gas-blowpipe, kept the upper portion in the molten state for some time by playing upon it with the flame, and stirred it with a little rod of graphite. After solidification the silicate was found to contain a vast number of microscopic crystals, but only in the part which had been in contact with the carbon. These Dr. Friedländer has subjected to a careful examination. They are octahedral or tetrahedral in form, are unattacked by hydrofluoric and sulphuric acids, have a high refractive index, sink slowly in

methylene-iodide, burn away when heated in a current of oxygen, and are unaltered if heated in a current of carbonic acid: the stony matter containing them scratches corundum. Hence Dr. Friedländer infers that they are diamond, and that the South African diamond may have been actually formed, as already suggested, by the action of a molten silicate, such as olivine, on graphite: carbonaceous shales are interrupted by the diamond-bearing rock, and numerous fragments of the shale, much altered, are found enclosed in the rock itself. The paper is illustrated with seven micro-photographs.

II.—Note on the Occurrence of Diatomaceous Earth at the Warrumbungle Mountains, New South Wales. By Professor T. W. Edgeworth David, B.A., F.G.S. Proc. Linn. Soc. New South Wales, 1896, pt. 2, pp. 261–268, pls. xv–xvii.

Diatomaceous Earth Deposits of New South Wales. By G. W. Card, F.G.S., and W. S. Dun. Records Geol. Surv. New South Wales, vol. v, pt. 3, 1897, pp. 128–148, pls. xii–xv.

DEPOSITS of Diatomaceous Earth occur not infrequently in Victoria and Queensland as well as in New South Wales, but so far there is no record of them in South Australia or in Western Australia. They are widely distributed in the older colony of New South Wales, for deposits are known at Cooma, about 260 miles to the south of Sydney; at Bathurst and the Mundooran district, 250 miles to the west; and also in the Warrumbungle Mountains, the Richmond River district, and at Barraba, from 300 to 350 miles to the north of Sydney.

At Cooma the deposit is over 20 feet in thickness; it lies in a hollow partly inclosed by hills of basalt, and is now only covered by surface soil. In the Warrumbungle Mountains there is a bed of diatomaceous earth 3 ft. 9 in. in thickness, interstratified in trachytic rocks, which are regarded by Professor David as of early Eocene or late Cretaceous age. In the Richmond River district the earth is found in depressions of scoriaceous basalt, and is overlaid by beds of the same material. At Barraba the diatom bed is eight feet in thickness, with a single intermediate band of coarse sand two inches in thickness; beneath it are mudstones and lava fragments imbedded in diatomaceous material, and it is overlaid by a flow of basalt considered by Mr. E. F. Pittman to be of Miocene age. This covering of basalt is now the summit of an elevated tableland.

In these various deposits there is a very close resemblance in the character of the diatomaceous earth, which is a light, whitish, powdery material, typically similar to that known from other parts of the world. In some instances the siliceous constituents have been partially dissolved, and now form bands and nodular masses of hard, homogeneous, colloid silica. Chemical analyses show from 81 to 97 per cent. of silica, with, as a rule, small amounts of ferric oxide, alumina, and carbonates of lime and magnesia.

Microscopic examination shows, further, a very singular uniformity in the diatoms composing these different deposits in New South

Wales, for they consist almost exclusively of two or three varieties of the genus *Melosira*, and, rarely, a few examples of *Navicula*. With the diatoms there is also a small proportion of acerate spicules of fresh-water sponges. The markings of the diatoms are as perfectly preserved as in recent forms. Detrital materials are absent in the beds, but in a few instances impressions of leaves of plants have been noticed. All the deposits are distinctly of fresh-water origin, and probably of Tertiary age. Professor David considers that the constant association of volcanic rocks with the diatomaceous beds is not accidental, as probably hot springs, and the lavas also, furnished supplies of silica to the lakes in which the diatoms lived. It is evident that the preservation of these beds is in many instances due to being overlaid by basaltic and trachytic lavas.

The diatomaceous deposits in Queensland, like those of New South Wales, mainly consist of *Melosira*, but in those of Victoria the variety of diatoms is considerably greater, and fourteen genera have been enumerated in some of the fresh-water beds.

G. J. H.

REVIEWS.

I.—Fossil Plants. For Students of Botany and Geology. By A. C. Seward, M.A., F.G.S. Vol. I. 8vo; pp. xviii, 452, with 111 illustrations. (Cambridge: Messrs. C. J. Clay & Sons, 1898. Price 12*s*.)

PALÆOBOTANY is no new creation of the *fin du siècle*, although, indeed, the subject has undergone considerable modification with the advance of botanical knowledge, more especially since it has been so largely assisted by the advances made in histological research.

We cannot but recall with gratitude the labours of such men as Sternberg, A. Brongniart, Lindley and Hutton, Göppert, Bowerbank, Schimper, Hooker, Williamson, Carruthers, De Saporta, Grand'Eury, and many others, who have paved the way for the botanist of to-day who desires to take up the study of Fossil Plants.

The author of the present volume is already favourably known as filling the office of Lecturer in Botany in the University of Cambridge, and has been a worker for the last ten years at palæobotany, one of his early papers having appeared in this Magazine for 1888 (p. 289); he is also the author of two volumes of a "Catalogue of Mesozoic Plants in the British Museum" (1894–5), and of several other papers of importance communicated to the Geological Society and elsewhere.

He tells us that "The subject of Palæobotany does not readily lend itself to adequate treatment in a work intended for both geological and botanical students. The botanist and geologist are not always acquainted with each other's subject in a sufficient degree to appreciate the significance of palæobotany in its several points of contact with geology and recent botany. . . . . It needs but