

that the interpretation of the geological structure of the district depends upon the correct determination of the age of this limestone, and we seem so near obtaining what would be regarded a crucial test, I am glad to announce that Professor Hughes has instructed me to carry out some not very extensive excavations which we hope may yield important results.

I would like here to thank Mr. A. H. Bloomfield for the valuable assistance he gave me during my recent visit to Creechbarrow, and I strongly recommend anyone who is visiting Dorsetshire for the purpose of studying its geology and collecting fossils to secure his services.

NOTICES OF MEMOIRS.

I.—NEW FAUNAL HORIZONS IN THE BRISTOL COAL-FIELD.¹ By HERBERT BOLTON, F.R.S.E., F.G.S.

THE well-known rarity of animal remains in the Bristol coal-field is proving to be due rather to the concealment of the measures beneath newer rocks than to any actual absence of fossils.

In 1906-7 the writer determined the existence of four horizons each possessing a marine fauna, between the top of the Millstone Grit and the lowest workable seam in the Ashton district; and further work upon the beds lying above the Bedminster seam at South Liberty Colliery, Bedminster, and at Coalpit Heath in the north of the basin, has proved the occurrence of others. A section at South Liberty Colliery is as follows:—

Strata	127·4
Black Shale with <i>Anthracomya</i>	4·11
Strata	337·8
Grey Shale with <i>Anthracomya</i>	3·7
Strata	2·0
Dark grey Shale with shells	2·8
Strata	150·0
Black shell-bearing Shale	3·6
Strata	134·4
Bedminster Seam	3·0

At Coalpit Heath, a black shale forming the roof of the High Vein (Hollybush Vein of Parkfield) has proved exceptionally rich in specimens of *Leaia Leidyi*, var. *Salteriana*, whilst *Estheria* cf. *tenella* and *Anthracomya Phillipsi* also occur.

II.—STUDIES ON THE STRUCTURE AND AFFINITIES OF CRETACEOUS PLANTS.² By MARIE C. STOPES, Ph.D., D.Sc., F.L.S., Lecturer in Palæobotany, Manchester University, and K. FUJII, Ph.D., Assistant Professor of Botany, Imperial University, Tokio.

THE authors comment on the importance of the work done on the flora of the Palæozoic period, and the botanical interest that would attach to similar petrifications of plants from all ages of the

¹ Abstract of paper read at British Association Meeting, Winnipeg, in Section C (Geology), August, 1909.

² Abstract of paper read before the Royal Society, May 27, 1909; communicated by Dr. D. H. Scott, F.R.S.

Mesozoic period. They have had the good fortune to find excellently preserved material from the Cretaceous of Northern Japan.

In the present paper they describe eighteen plants from this material, which is extraordinarily rich. As hitherto there has been very little known from anatomical material of plants of this age, the present paper is by no means final, but is in the nature of a pioneer chart of the ground.

The petrification of the cells of the plants is often extremely good, though the fragments are not so complete as could be desired. The plant-structures include stems, roots, leaves, cones, fern sporangia, and even an Angiospermic flower, the first petrification of a flower to be described. The débris lie together in the nodules in much the same way that the débris lie in the Coal-balls of the Palæozoic, though they are mixed with fragments of shells. The latter are largely Ammonites, and serve to determine the age of the petrifications.

The flora as a whole represents an interesting mixed flora such as has not hitherto come to light among petrifications.

Roughly speaking, the flora seems to have consisted of about one-third Angiosperms, slightly more than one-third Gymnosperms, and the rest of ferns and lower plants. The anatomy of the early Angiosperms being such a desideratum in botany, their presence in the petrifications renders them doubly interesting, and particularly when they are found in so evenly balanced a mixed flora.

All the specimens described in this paper were cut in Tokio in the botanical department by the authors.

The plants described are as follows:—

Petrosphæria japonica, gen. et sp. nov. A fungus which has numerous microsclerotia, in the periderm of one of the Angiosperms, *Saururopsis*.

Schizæopteris Tansleyi, gen. et sp. nov. The sorus and sporangia of a Schizæaceous fern.

Fasciostelopteris mesozoica, gen. et sp. nov. The stem and petiole of a fern with a dictyostelic anatomy. Probably allied to the *Dicksoniaceæ*.

Fern rootlets, in excellent state of preservation, showing the diarch stele of the leptosporangiate ferns.

Niponophyllum cordaitiforme, gen. et sp. nov. The leaf of what appears to be some plant of Cycadean affinity, the anatomy bearing considerable resemblance to that of *Cordaites*.

Yezonia vulgaris, gen. et sp. nov. A Gymnosperm, of which stems, unthickened twigs, leafy axes, are all very plentiful. It is the commonest plant in the material, and at the same time the most unique. In the anatomy of both main axis and foliage it is not like any known type.

Yezostrobus Oliverii, gen. et sp. nov. The fructification of a Gymnosperm, the cone bearing simple scales with seeds, one on each, which are like those of Cycads in some respects, but have a nucellus standing up entirely free from the integument with a well-marked epidermis between.

Though continuity is lacking between these two plants, there seems considerable ground for suspecting them of belonging to the same plant from anatomical points of likeness.

Araucarioxylon tankoensis, sp. nov. Secondary wood, showing remarkably clear pittings in the transverse sections.

Cedroxylon Matsumurii, sp. nov. Well-preserved secondary wood.

Cedroxylon Yendoii, sp. nov. Secondary wood, with traumatic resin canals.

Cunninghamiostrobus yubariensis, gen. et sp. nov. A cone, as its name implies, belonging to the family of the Cunninghamias, with its external appearance partly preserved and the cone scales and axis fairly well petrified. The seeds have apparently been scattered.

Cryptomeriopsis antiqua, gen. et sp. nov. Stem with leaves attached, the foliage very like that of a *Cryptomeria*.

Saururopsis niponensis, gen. et sp. nov. The stem and attached roots of an Angiosperm, probably to be included in the Saururaceæ.

Jugloxylon Hamaoanum, gen. et sp. nov. The secondary wood of an Angiosperm.

Populocaulis yezoensis, gen. et sp. nov. The stems of an Angiosperm, with cortical tissue.

Fagoxylon hokkaidense, gen. et sp. nov. The secondary wood of an Angiosperm.

Sabiocaulis Sakurii, gen. et sp. nov. Minute stems and older twigs of an Angiosperm, with cortex, and well-preserved and characteristic anatomy.

Cretovarium japonicum, gen. et sp. nov. The flower of an Angiosperm, of which there are several specimens.

Of this list of plants, the commonest, i.e. those which have yielded the greatest number of specimens in the course of the work, are *Yezonia*, *Sabiocaulis*, and *Cretovarium*. It is noteworthy that these are among the most unusual and the most interesting of the plants.¹

REVIEWS.

I.—IGNEOUS ROCKS: COMPOSITION, TEXTURE, AND CLASSIFICATION; DESCRIPTION AND OCCURRENCE. By JOSEPH P. IDDINGS. In two volumes. Vol. I²: Composition, Texture, and Classification. 8vo; xi+464 pages, 130 figures, and 1 coloured plate. Cloth. New York, John Wiley and Sons; London, Chapman & Hall, Limited; 1909. \$5 (21s.) net.

THIS is the first part of a new textbook of the petrology of Igneous Rocks, and is meant to serve as an introduction to an exposition of the 'quantitative' classification. For this reason special prominence

¹ The authors acknowledge much assistance in the work from the Royal Society Government Grant Committee, which made it possible for one of them (M. C. S.) to attempt the work; and from the various departments of the Imperial Government of Japan in the course of collecting and preparing the material.

² Vol. II: Description and Occurrence (in preparation).