

outlying Eocene tracts, which were in existence during late Pliocene time, were broken up and spread out by the severe climatic conditions of the Glacial Period. In post-Glacial time little has been added, but much removed by erosion.

2. "On Footprints from the Permian of Mansfield (Nottinghamshire)." By George Hickling, B.Sc. (Communicated by Professor W. Boyd Dawkins, D.Sc., F.R.S., F.G.S.)

These fossils were discovered in 1897 by Mr. Francis Holmes in the Rock Valley Quarry, Mansfield, in a local lenticular mass of sandstone intercalated in the Magnesian Limestone. The impressions formed two double rows, approximately parallel, and 7 and 2 feet long respectively. Nearly the whole of the longer series is in the Nottingham Museum, and part of the shorter series in the Manchester Museum. Both sets were made by the same species of animal, the stride in one case being 8 and in the other  $8\frac{3}{4}$  inches. The prints show a well-marked heel and comparatively slender digits, and there is evidence of a membrane between the toes. There is wide separation between the right and left sides, this separation being more marked in the fore than in the hinder footprints. The prints present some resemblance to those named *Ichnium acrodactylum*, from the Upper Permian of Thuringia. Recently the author has found other prints in the same quarry.

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## CORRESPONDENCE.

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### THE ZONE OF *OSTREA LUNATA*.

STR,—I am very glad that Mr. Brydone is publishing his further observations on the Chalk bluffs of Trimmingham, and it is clear they will throw valuable light on the much disputed question of the manner in which these masses were brought into their present positions.

I am sorry, however, that he should object to my choice of *Ostrea lunata* as the index-fossil for the zone which his previous observations enabled me to establish on a firm basis; the more so as his reason for objecting to the choice seems to me to have little force. He admits that *O. lunata* "has two characteristics of an ideal name-fossil in that it is, as far as we know, almost confined to the Trimmingham Chalk, and that in that chalk it always occurs abundantly if at all." He thinks, however, that "it fails to fulfil the most important requirement for a good zone-fossil in that it is not distributed all through its so-called zone."

Moreover, Mr. Brydone seems so sure that *O. lunata* will not do as an index that he proposes to rename the beds as the "zone of *Terebratulina gracilis* and *T. Gisei*," in spite of the most obvious objections. I am therefore compelled to defend my choice of a zone-name from his attack upon it.

In the first place I must ask Mr. Brydone why he asserts that the

index-fossil of a zone must be distributed "all through its zone," and what he means by this expression. I am sure that he does not expect to find the chosen fossil in every foot of the chalk which makes up the zone. I suppose, therefore, he means that it ought to occur at frequent intervals throughout the zone, and that the total thickness of beds in which it does occur should be greater than that of those in which it does not.

I greatly wish that fossils would occur in such a well-regulated manner, but unfortunately their behaviour often falls sadly short of what we should like it to be. Mr. Brydone must surely have forgotten that *Marsupites* is not a common fossil throughout the zone of which it is accepted as the index. In fact, it is common only in the *Marsupites* band or subzone, and is rare or absent in the *Uintaerinus* band. Yet I am not aware that anyone has objected to its being used as the index-fossil of the zone, and I sincerely hope that no such objection will ever be taken.

Again, has Mr. Brydone considered the case of the zone of *Act. quadratus*, where that species (as now restricted) only occurs rarely, especially in the higher part of the zone. It is true that Mr. Rowe has proposed to take *Offaster pilula* as the index-fossil, because it is common throughout, but this generally occurs at intervals only, being common in spots or in bands and rare or absent in the intermediate beds, just as *Ostrea lunata* seems to be absent from certain beds in the Trimmingham Chalk.

From the succession of beds given by Mr. Brydone on p. 14 of this Magazine, and assuming his group 3 to be identical with part of his group 4, it is seen that *O. lunata* occurs abundantly at four horizons in the series, and that it occurs in all three divisions. This is quite sufficient to satisfy all reasonable demands on any fossil for qualification as the index of a zone; consequently I must maintain the propriety of my choice, and must object to any other species being substituted for *Ostrea lunata*, unless a much better reason can be given than that advanced by Mr. Brydone.

A. J. JUKES-BROWNE.

FLORISTON, TORQUAY.

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DISCOVERY OF *EXOGYRA SINUATA* IN THE LOWER GREENSAND OF CULHAM, NEAR OXFORD.

SIR.—It might interest your readers to hear of the finding of a specimen of *Exogyra sinuata* by Mr. W. D. Hutchinson and myself in the Lower Greensand of Culham, near Oxford.

The specimen is a large one, and was found in a bed of coarse laminated sandstone, in a neighbourhood where the Greensand has been considered unfossiliferous.

CLINTON G. E. DAWKINS  
(Balliol College, Oxford).

6, LARKSTONE TERRACE, ILFRACOMBE.