

species collected, including notes on *Productus*, *Chonetes*, *Derbya*, and *Orthothetes*, contributed by Dr. A. Vaughan, and new species of *Chonetes*, *Raphistoma*, and *Loxonema*.

2. "Brachiopod Morphology: *Cincta*, *Eudesia*, and the Development of Ribs." By S. S. Buckman, F.G.S.

The test ornament of Brachiopods is found in three main phases—smooth, ribbed, and spinous; and of these three, a costate species is more advanced than a smooth one, and less advanced than a spinose one. There are catagenetic developments, also, in reverse order; but these may, for the present, be neglected. Dall has stated that *Cincta* (*Terebratula numismalis* Group) is a synonym of *Eudesia* (*T. cardium* Group); but, although it would be quite possible for costate forms to be developed from the smooth *Cincta*, yet they would not be costate forms of the *Eudesia* type: in the *Cincta* type the costæ developed would be of the kind which produced opposite carination of both valves, while in *Eudesia* the costæ on the two valves are alternate, the carinæ of one valve being opposed by sulci in the other. This fundamental difference not only prevents the inclusion of *Eudesia* and *Cincta* in one genus, but shows that they belong to entirely different series. The first phase of development dealt with may be called the lenticular stage, which might develop in either of the two directions indicated. The next phase would be the *Cincta* stage, in which the front margin is rounded in youth, truncate in adolescence, incipiently excavate and bilobate in the adult, as the growth-lines of the specimens show. The *Cincta* stage may develop in two directions—out of broad forms the quadrid stage, out of narrow forms the cornute stage. The next development may be called the quadricarinate or trigonellid stage; and the fourth stage, the multicarinate or *pectunculus* stage. In *Eudesia* there is a highly developed multicarinate stage, but the carinæ are alternate, not opposite. In degree of ribbing it is higher than *Cincta*, and in a way even higher than the *pectunculus* stage; but both the ribbing and the loop forbid connection with *Cincta*. The preceding stage is exemplified by *Ismenia pectunculoides*. A prior stage may be seen in *Megerlia Munieri*; and, as an example of the incipient uniplicate stage, *Terebratula Whitakeri* may be given. Certain emendations in nomenclature appear to be necessitated as a result of this communication; new names are given, and their application defined. A Table is added to show the successive stages of development along the two lines.

CORRESPONDENCE.

CALCAREOUS NODULES.

SIR,—It is interesting to learn, from Dr. Stopes' article on the relation of the Yarra concretionary nodules and the Lancashire and Yorkshire 'coal-balls,' that her recent researches, in conjunction with Mr. Watson, promise to settle the question of the origin of the latter

examples. In that paper Dr. Stopes states the supposition that the Yarra calcareous nodules are “more nearly approximate” to the clay-ironstone nodules of the Carboniferous. I was not aware, however, that these contained so large a proportion of woody material as we find in the Yarra nodules, the vegetable remains in the ‘siderites’ being usually in the form of impressions or carbonaceous films. The proportion of argillaceous matter, moreover, in the nodules from the Yarra, is exceedingly small, whilst the amount of calcareous material is comparatively large. Since I omitted to give the percentages in my paper on the subject, they are here appended. From the context of that paper it will be apparent that the qualifying term ‘clay’ (only once used in connection with these nodules) was a *lapsus calami*.

The analysis of the nodules from the Yarra estuary is as follows:—Carbonaceous matter = 55 per cent.; calcareous = 41 per cent.; arenaceous and argillaceous = 4 per cent. With regard to the occurrence of quartz-grains, zircons, etc., in the Yarra nodules, it will be seen on consideration that these are accidental constituents of the matrix, due to local conditions, and which would in no respect affect the comparison; whilst the solidity and more completely calcified condition of the English ‘coal-balls’ could be accounted for by difference in age.

I have examined a large number of the English ‘coal-balls,’ both microscopically and in hand specimens, and had brought with me to Melbourne a number of characteristic examples, which I have used for comparative purposes. I am not in a position, however, to discuss their relation to the beds in which they occur, since I have not examined them *in situ*; and therefore await Dr. Stopes’ detailed description with the greater interest. When these results are published we may perhaps also learn whether the stems of *Calamites* and twigs of *Lepidodendron* have been found actually passing from the nodules into the surrounding deposits. In conclusion, be the theory proved either way, personally speaking it will be equally satisfactory to know that the *modus operandi* of their formation has been successfully elucidated.

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AN UNPUBLISHED LETTER OF SIR JOSEPH PRESTWICH ON
SUBMERGENCE OF THE BRITISH ISLANDS IN PLEISTOCENE
TIMES.

SIR,—At a time when the views of those who, like myself, hold that the partial submergence of the British Isles is the only way in which the existence of beds with marine shells of living species can be truly accounted for, have been partially discredited by the address of the President of Section C at York last year, it may be well to produce the following letter of Sir Joseph Prestwich, upon which I have accidentally lighted while turning over a book of geological memoranda written some years since. In explanation of this letter I may mention that it was written in answer to one from myself, in which I called