the roots of mountain chains forming ridge-shaped projections on the lower surface of the solid crust.

Perhaps it is not generally known how nearly this resembles a theory propounded by the late Mr. Hopkins of Cambridge thirty or forty years ago. He maintained that the earth is solid at the surface from cooling, and at the centre from pressure; that the solid centre is for the most part continuous with the solid crust; but that in volcanic regions there are subterranean lakes of molten matter between the two.

I speak with no authority, but I think it most probable that the earth is solid throughout, with the possible exception of small and perhaps only temporary reservoirs of lava. The fact that the lava in neighbouring craters often stands permanently at different levels, proves that they cannot be in communication with a common reservoir; and the tremulousness of the earth's surface, which the microphone reveals, seems to me to prove only that the materials composing it are elastic and slightly flexible.

BELFAST, 9*th Sept.* 1885. JOSEPH JOHN MURPHY.

MR. LYDEKKER ON *ESTHONYX*.

SIR,—The article in your August number by Mr. Lydekker on the identity of *Esthonyx*, Cope, with *Platychærops*, Charlesworth, excited my interest, and requires a few words of comment. It is of the greatest importance to determine, if possible, the identity of generic and specific forms in widely separated localities during past geological ages. This has occasionally been successfully accomplished, as, for instance, the determination of *Hyrachyus*, by Gaudry, and of *Oxyæna*, by Filhol, in France. In other cases discovery of missing parts has shown that such supposed identification were premature. Thus, I have been compelled to recede from some identifications of American with European Lemuroids.

After an examination of Prof. Owen's figures and description of *Miolophus planiceps*[1] cited by Mr. Lydekker, I find that the identity of *Esthonyx* with *Miolophus* is extremely improbable, and could as well be asserted of at least one other genus. Indeed, there is nothing in the technical characters of the superior molars to prevent the identification of *Miolophus* with *Chriacus*, *Mioclaenus* or *Deltatherium*, genera which only differ from each other in the characters of the superior and inferior premolars and inferior molars. But *Esthonyx* differs still more from the normal types in its very peculiar incisors. In order that *Miolophus* should be identified with *Esthonyx* under these circumstances, some evidence as to the characters of its incisors should be obtained, which is not the case as yet. Mr. Lydekker appears to attach some importance to a space behind p.m. 3. This space in the specimen of *Esthonyx Burmeisteri* figured by me, may be due to accident, as the maxillary bone is in bad condition, and a fissure traversed the first true inferior molar. There is also a good reason for suspecting that the genera in question are not identical. This is the presence of a loop-like inner posterior

[1] *Platychærops Richardsoni*, teste Lydekker.

cingulum, quite distinct from the rest of the crown, in *Esthonyx*, which is absent in *Miolophus*, according to Owen. Though this is not alone a generic character, in my opinion it is one of those indicators which generally accompany them. In like manner, *Miolophus* presents no important distinction from *Deltatharium*, but the wide internal lobes of the crowns lead me to suspect that such exist.

As to the name *Platychœrops*, it cannot be adopted, as its publication was not accompanied by the distinct generic description which the accepted rules of nomenclature require. E. D. Cope.

THE BATRACHIA[1] OF THE PERMIAN BEDS OF BOHEMIA.

Sir,—In Dr. Fritsch's volume we have the continuation of an extensive work which I have noticed at various times in the "Naturalist" as the successive parts appeared. I desire to add, on this occasion, my renewed commendation of the care and detail with which Dr. Fritsch continues to develope the subject, and my praise for the admirable plates which accompany the text. The species treated of are those which belong to the larger forms of the Rhachitomi, together with some of the intermediate types, such as the Dendrerpetonidæ. Of the greatest interest are two new genera of the order Embolomeri, *Chelydosaurus* and *Sphenosaurus*, where the additional vertebral centrum, entire in the type of the order (*Cricotus*), is divided into three segments, two lateral and an inferior. This is a curious discovery, especially as *Sphenosaurus* has hitherto been regarded as a reptile.[2] It also has an important bearing on the value of the order Embolomeri, which Dr. Fritsch is disposed (p. 4) to question. He thinks that the embolomerous vertebral structure is confined to the caudal region in the genus *Cricotus*, although I have figured it in the lumbar and cervical region of that genus, and described it as found in the dorsal[3] region. Dr. Fritsch reached this conclusion because he finds that in *Archegosaurus* the caudal region is embolomerous, and the dorsal region rhachitomous. His discovery of the persistence of the embolomerous condition in the dorsal region of *Chelydosaurus* and *Sphenosaurus* might have suggested to him the correctness of my observations on *Cricotus*. I add here that in *Eryops*, in which the dorsal vertebræ are rhachitomous, the caudal vertebræ are not embolomerous. So *Archegosaurus* stands alone in this respect. This determination of the characters of *Archegosaurus* by Dr. Fritsch is very useful to American palæontologists, as it has hitherto been very imperfectly described. I have stated that there are vertebræ of this type from Lebach in the Museum of Princeton College, New Jersey. As they agree exactly with Dr. Fritsch's figures of *Archegosaurus*, it is difficult to perceive why he denies the accuracy of my statement in the matter (p. 15). E. D. Cope.

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[1] Fauna der Gaskohle in d. Kalksteinen d. Permformation Böhmens. Von Dr. Anton Fritsch, b. ii. heft i.; Praag, 1885.

[2] These two genera should form a second family of the Embolomeri, characterized as above, which I call the Sphenosauridæ.

[3] Proc. Amer. Philo. Soc. 1884, p. 29.