

CORRESPONDENCE.

SPIRAL CONCRETIONS AND BORING ORGANISMS.

SIR,—The writer was interested to read the recent paper by Mr. Thomas on “spiral concretions” (*Proc. Geol. Assoc.*, xlii, 1–17, 1935). Mr. Thomas’s conclusions as to the origin of these structures seem, however, at variance with certain facts put forward by the writer some few years ago (*Proc. Nat. Acad. Sci.*, 19, 139–143, 1933).

At one locality in the Miocene of Maryland there is exposed a sharp change of lithology between sands above, and fine-grained, “brittle” clay below. The contact between these two types is shown to be unconformable by its rising against the regional dip, by boring and channelling of the upper surface of the clay, and by consideration of distribution and other stratigraphic data.

Extending downward for a distance of some 2 feet from the top of the clay are spiral “structures”. They resemble exactly holes which might be made by a corkscrew 2 feet long and $1\frac{1}{2}$ inches outside diameter—these holes then being filled with sand from the bed overlying the unconformity. The “filling” of the holes is identified by its different colour, as well as by its mechanical and mineralogic composition.

At least two possible origins of these structures suggest themselves: (1) spiral concretions were formed in some manner in the clay; then these concretions were carried entirely away, sand from the overlying bed being substituted for the material of the concretions, or (2) animals (or plants?) living on the surface of the clay made spiral borings in it, during, or probably after which time, sand filled the borings. The sand continued to accumulate, forming the overlying bed.

To (1) it may be objected that: there are now no concretions, nor signs of concretions in the clay, or in the sand above; that the walls of the “borings” are sharp and clean, with no weathering or leaching of any kind visible; that it is remarkable that the putative concretions should all reach upward just to the unconformity at the top of the clay; that there are no joints, bedding planes, or other obvious channels for solutions to pass through the apparently impermeable clay; that, finally, had there been spiral concretions present, their origin would remain totally unexplained, despite references by Thomas to experiments on diffusion into gels and like substances. Lange has described “spirale Wohngänge” consisting of one spiral within the other (*Zeits. d. d. Geol. Ges.*, 84, 537–543, 1932). Diffusion into a gel would seem to be even less likely as an explanation in this case.

To (2) it may be objected that the boring form is not known.

It seems to the writer that no explanation other than that of boring from above is applicable in the cases described. However, one can easily envisage induration of the sand fillings, and their

subsequent separation from the less resistant rock surrounding them by erosion, weathering, or other processes. One confronted by such isolated structures might make almost any guess as to their origin. The examples figured by Thomas, as well as those of Mansfield, seem to be such indurated fillings, which now have lost most of their meaning because nothing is known of their relation to the rock which invested them.

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ANNOUNCEMENTS.

CLOUGH MEMORIAL RESEARCH FUND.

Through the generosity of Mrs. Clough a fund was instituted in 1935 in memory of her late husband Dr. C. T. Clough. The purpose was to encourage geological research in Scotland and the North of England, where Dr. Clough carried out his outstanding work. The North of England is defined as comprising the counties of Northumberland, Cumberland, Westmorland, Durham, and Yorkshire. Under the terms of administration of the fund a sum of approximately £30 will be available annually.

Applications for the grant are invited for the period 1st April, 1936, to 31st March, 1937. These applications should state:

- (1) The nature or research to be undertaken.
- (2) The amount of grant desired.
- (3) The specific purpose for which the grant will be used, e.g. travelling expenses, maintenance in the field, excavations of critical sections, etc.
- (4) Whether any other grant in aid has been obtained or applied for.

Applications should be in the hands of the Secretary, Clough Memorial Research Fund, Edinburgh Geological Society, Synod Hall, Castle Terrace, Edinburgh, not later than 1st February, 1936.

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