

selves destined to be modified by similar causes. The known permanence of certain animals and plants for several hundred years, and the sterility of hybrids, were adduced as evidence that aberrant animals and plants recur to the type from which they have diverged, and that true species are permanent.

The Chairman, alluding to the admitted progressive character of fossil species, wished that the Lecturer had been able to take into consideration the cause of that progressive advance.

---



---

CORRESPONDENCE.

---

NOTE ON BELEMNITES CLAVATUS, BLAINV.—I am happy to be able to reply to the inquiry of Professor Phillips, regarding the form of the phragmacone in *Belemnites pistilliformis*, Sow. (*B. clavatus*, Blainv.), by the statement that it has proportions similar to those of other *Belemnites*, and is *not* slender and elongated as in *Xiphoteuthis*. A specimen showing this (a guard and phragmacone, in stone, rubbed down and polished so as to exhibit a section) was lately in my collection, and is now, if I mistake not, in the Museum of Practical Geology.

NOTE ON XIPHOTEUTHIS ELONGATA.—Since the publication of Professor Huxley's Memoir, I have obtained a fine specimen (now in the Jermyn Street Collection) of this species. The guard of this example was fractured in extraction from the matrix, and showed clearly that, in this instance at least, it was tubular throughout, though closed at the extremity. From what I have seen in other specimens that have come under my notice, I am strongly of opinion that this is a normal character, and that a solid guard is the result of fossilization.—EDWARD C. HARTSINCK DAY, Charmouth.

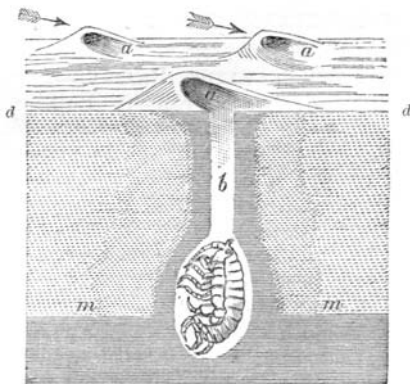
---

SURFACE-MARKINGS ON SANDSTONE.

*To the Editor of the GEOLOGICAL MAGAZINE.*

SIR,—For many years the peculiar markings found so frequently in sandstone and other rocks, from the Cambrian upwards, have been attributed by Geologists to the effect of heavy rain-drops falling on plastic mud, or moist impressible sand. Together with my fellows, I believed the markings to be due to rain-drops, until a fortunate discovery proved the conjecture untenable. During the summer of 1859, while shooting sea-fowl, shortly after sun-rise, on the sands near Leith, I observed peculiar depressions, with cusps, precisely similar to those so well represented in Plate IV. in No. IX. of the GEOLOGICAL MAGAZINE. They were identical with the depressions caused by rain-drops during a thunder-storm; but as the streets in the town were dry, my curiosity was excited. On calling the attention of a neighbouring watchman to the markings, he informed me that no rain had fallen through the night, and so I looked for another cause

to produce the effect. It was not long before I discovered that these depressions were confined to a certain well-defined zone in the sandy shore, none appearing above or below it; further, that they were the burrows of the *Gammarus*, or Sand-hopper. Each of these conical depressions contained water; and as the wind was blowing the sand from above, a cusp was produced round each towards the leeward side of the minute crater. (See Woodcut.) Now, all that was necessary to preserve these *Gammarus*-burrows, was simply their being filled up by the dry sand, and thus kept from the degrading action of the advancing tide.



TALITRUS (*Gammarus*) SALTATOR, Edw.  
The common Sand-hopper in its burrow.

(*a, a, a*), apertures of three burrows upon the surface of dry sandy beach (*d, d*);—(*b*) burrow seen in section around which the sand is always moist;—(*m, m*) depth at which the beach is moist at low water. The arrows indicate the direction of the wind.

Another consideration satisfied me that in no instance can we expect to find the fossil marks of rain-drops unless a special condition, such as Gideon of old prayed for, were obtained; namely, that one portion should be dry, and all around moist. For all the casts of foot-prints, gasteropod-tracks, and the so-called fossil rain-drops, one condition is essential,—that before the next tide these markings must be filled up with dry dust or sand. It is therefore clear that no such traces of rain-drops can be found, as all around must have been wet, and the next tide would certainly obliterate any trace of the depressions. Great caution is necessary to distinguish the track of a Gasteropod from that of a Nereid on the soft sand. When the track of a whelk is being filled up by the dry sand blown into the depression *in the line of progress*, no difficulty is felt in recognizing it as the track of a Gasteropod; but should the wind blow at right angles to the track of the Mollusc, a series of setæ-like markings will be observed to leeward, caused by the dry sand adhering to the moist. In this instance a geologist would naturally assign the markings to the impression of *Graptolites pristis* or *G. sagittarius*. And if the wind suddenly shifted to the opposite direction, another series of setæ

would be formed on the other side of the Mollusc's track ; and the observer would at once pronounce the marks to be due to a gigantic *Crossopodia*, or fringe-footed Annelide.—Yours truly,

A. BRYSON.

Hawkhill, Edinburgh.

---

### MISCELLANEOUS.

---

**THE FALCONER MEMORIAL.**—At a meeting held in London on the 25th of February, Sir Proby T. Cautley, K.C.B., in the chair, it was resolved to record the great loss sustained by Science in the early death of the late Dr. Hugh Falconer, and to perpetuate his name as a Naturalist and a Scholar by a suitable Memorial. It was unanimously resolved that this Memorial should include a Marble Bust, to be placed in the rooms of one of the Scientific Societies, or elsewhere, in London, as might be determined. One of the objects in which the late Dr. Falconer took deep interest, up to the latest hour of his life, was the foundation of Fellowships or Scholarships in the University of Edinburgh, to enable deserving students to prolong their studies beyond the usual academical period. It was therefore further resolved to collect funds for the purpose of founding, in that University, a Fellowship or Scholarship in Natural Science, tenable for a limited term of years, and to be called 'The Falconer Fellowship' or 'Scholarship.' The Presidents of the Royal, Linnean, Geological, Geographical, and Ethnological Societies, and many other friends and admirers of Dr. Falconer, have formed a Committee for promoting the objects of the 'Falconer Memorial.'

**THE LATE EARTHQUAKE IN THE NORTH OF ENGLAND.**—On Wednesday, the 15th of January, an earthquake of very unusual severity occurred in Morecambe Bay, and the neighbouring district of Furness. The following account of the more striking effects is abridged from a long article in the 'Barrow Herald' of Feb. 18th :—About three minutes past 11 A.M., the people of Barrow were terror-stricken by an earthquake-wave which came in the direction of Salhouse Marsh, and passed along towards Hindpool, where it would appear to have terminated. So far as yet known, the vibration would appear to have commenced at Mickle Island in Morecambe Bay, where it threw up large volumes of sand and stones to the height of 5 or 6 feet. Two distinct shocks were felt there, following each other at an interval of five minutes. Roa Island, close by, suffered severely. At the Pier Hotel the walls and ceilings were cracked, and bottles, plates, &c., were thrown down. The cellar seems to have escaped injury. Great fissures were made in the earth 300 yards from the hotel, towards the railway-embankment. At Westfield, Pease Holmes, and Rampside (on the coast), which seems to have suffered most, walls, ceilings, roofs, and chimneys of houses and outbuildings were fissured or severely injured by the shocks: indeed, there are many instances of cracked, bulging, and fallen walls and chimneys. Furniture was thrown down; and in