

visible if the pseudopodia were withdrawn. Perhaps some reader of NATURE who has studied these protozoa may be able to tell me whether these striæ are commonly met with (in which case lack of power of observation has caused me previously to overlook them), or whether they may be pathological, resulting from some debility in the organism. Certainly the Amœbæ in which I noticed the striated protoplasm seemed to be as lively as any without it. Like all those whose business it is to teach elementary biology, I have examined hundreds of Amœbæ, but to-day for the first time I saw the condition described. No text-book in my possession refers to or figures it. I shall be happy to send a drawing to anyone who may wish.

Eton College, February 12.

M. D. HILL.

#### An Alleged Originator of the Theory of Atoms.

MOCHUS of SIDON, the alleged precursor of Demokritus, is not so unknown to historians of science as Prof. See seems to think (February 13, p. 345), nor is Strabo the only ancient writer who alludes to him; see, for instance, Josephus, "Antiquities," i., 3, 9. But nobody takes him seriously. The book of Mochus is one of the numerous literary forgeries which appeared in Alexandrian times. So far as I can find, it is not mentioned by any of the doxographic writers, so it is probably not much older than the time of Posidonius.

J. L. E. DREYER.

Armagh Observatory.

#### NOTES ON ANCIENT BRITISH MONUMENTS.<sup>1</sup>

##### V.—Avenues (continued).

SO far I have not referred to the avenues at Shap. Mr. Lewis, in a memoir "on the past and present condition of certain rude stone monuments in Westmorland,"<sup>2</sup> gives extracts from several authorities showing that in the long past these avenues were not inferior to any in Britain.

Thus Camden (middle of the sixteenth century) writes:—"Several huge stones of a pyramidal form, some of them 9 feet high and 4 feet thick, standing in a row for near a mile, at an equal distance, which seem to have been erected in memory of some transaction there which by length of time is lost." Dr. Stukeley, writing about the middle of the last century, says:—"At the south side of the town of Shap we saw the beginning of a great Celtic avenue on a green common; this avenue is 70 feet broad, composed of very large stones set at equal intervals; it seems to be closed at this end, which is on an eminence and near a long flattish barrow with stone works upon it, hence it proceeds northward to the town, which intercepts the continuation of it and was the occasion of its ruin, for many of the stones are put under the foundations of walls and houses, being pushed by machines they call a 'betty,' or blown up with gunpowder; . . . houses and fields lie across the track of this avenue, and some of the houses lie in the enclosure; it ascends a hill, crosses the common road to Penrith, and so goes into the cornfields on the other side of the way westward, where some stones are left standing, one particularly remarkable, called the 'Guggleby' stone<sup>3</sup> . . . I guess by the celebrity and number of the stones remaining there must have been 200 on a side" (he says the interval between the stones was 35 feet, which would give about 7000 feet, or nearly a mile and a third, or, allowing for the thickness of the stones themselves, a mile and a half, as the length of the avenue); "near them in several places are remains of circles to be seen of stones set on end, but there are no quantity of barrows about the place, which I wonder at." Gough, in his edition of Camden (1806), says:—"At the south end of the

village, on the common near the road-side [on the east side thereof] is an area upwards of half-a-mile long and between 20 and 30 yards broad, of small stones; and parallel to the road begins a double row of immense granites, 3 or 4 yards diameter, and 8, 10, or 12 yards asunder, crossed at the end by another row, all placed at some distance from each other. This alley extended within memory over a mile quite through the village, since removed to clear the ground; the space between the lines at the south-east end is 80 feet, but near Shap only 59, so that they probably met at last in a point. At the upper end is a circle of the like stones 18 feet diameter." This description is evidently taken by Gough from the "History and Antiquities of the Counties of Westmorland and Cumberland," by Joseph Nicolson, Esq., and Richard Burn, LL.D. (London, 1777), an extract from which has been obligingly communicated to me by Col. Hellard, R.E., the director of the Ordnance Survey, and from which the remark enclosed in square brackets has been taken.

Mr. Lewis informs us that "Camden also mentioned an ebbing and flowing well, which Gough said was lost, and that its peculiarity was purely fortuitous; still it might have been used for the advantage of the priesthood who probably set up the stones. . . . From the descriptions already quoted it would seem that the avenue ran northerly or slightly north-westerly."

With such assiduity were these memorials of the past removed that when the Ordnance survey was made the final examiner recorded in the parish name-book for Shap (1858):—"No one person in the parish of Shap can point out the site of the old avenue of granite stones, or can tell whether the small spot well known as 'Karl Lofts'<sup>1</sup> is the S. or N. end of the Monument. It is most likely the N. end, as about  $\frac{1}{2}$  a mile S. is a portion of a circle still to be seen, composed of huge granite boulders, and which probably is the southern turning of the Avenue. It would appear to have been preserved in Doctor Burn's time, but except 2 or 3 boulders, itself and all recollection of it, have faded from Shap."

In spite of this, I think it has been possible to make out the position and direction of the avenues from the few stones shown on the Ordnance 25-inch maps which Col. Hellard has been good enough to send me. Taking the stones of which at least three are in the same straight line, we get two avenues crossing to the E. of the turnpike and to the south of the village, as stated in the preceding descriptions. As measured on the 25-inch Ordnance sheet, the azimuths are S. 19° E. and S. 40° E. From measurements of the contours on the 1-inch map, the elevation of the horizon is about 1° 10' in each case.

These data give us declinations 32° 32' S. and 25° 54' S. respectively.

In bringing together the information available about avenues, I have been greatly struck by the existence of several with an orientation of S. 20°-30° E. The first of this series which I came across, on the ground, were those at Challacombe, an imposing monument once consisting of eight rows of stones with an orientation of N. 23° 27' W., or S. 23° 27' E. ("Stonehenge," p. 158). The rows might have been used in the south-east direction to observe the rising of a southern star; on the other hand, in the north-west direction, they might have been aligned on the setting of Arcturus, warning the summer solstice sunrise in 1860 B.C.

As this date was near to those suggested by the

<sup>1</sup> About 47 chains S. by E. of St. Michael's church.

<sup>1</sup> Continued from p. 251.

<sup>2</sup> Journal Anthropological Institute, November, 1885.

<sup>3</sup> Twenty-six chains S.W. of St. Michael's church. It is about 8 feet high, of a wedge-like or conical shape, placed upright with the heavy end uppermost. (Ordnance surveyor's note.)