

SPONGE SPICULES IN RHYOLITIC ASHES

SIR,—Dr. K. P. Oakley, in his paper on “The Organic Content of Recent Rhyolitic Ashes in Malaya” (this Magazine, July–August, 1940, pp. 289–294), queries the opinions previously expressed by myself and Dr. M. Burton (“A Recent Rhyolite-ash with Sponge-spicules and Diatoms in Malaya”, this Magazine, September, 1930, pp. 385–393) that certain bodies are sponge-spicules, and adds that now Dr. Burton is inclined to agree with his views. In a letter dated 2nd February, 1942, Dr. Burton informs me that he now agrees with Dr. Oakley that these bodies are not sponge-remains. As the supposition that they were originated with me I take full responsibility for it and should be ready to let the matter rest pending further information were it not for two points. The first is that in the 1939 Annual Report of the Federated Malay States Geological Survey Department it was stated that it had been proved that the ash does not contain any sponge-remains. No proof has been established about the nature of these bodies, but conflicting opinions have been expressed. The other point is that after further work on slides that I fortunately have in Bedford and on fresh material I cannot agree with Dr. Oakley’s objections on p. 292 of his paper to these bodies, which can be briefly described as rods, spheres, and club-shaped objects, being sponge-remains. The objections are:—

1. The spheres, which Dr. Oakley calls spheraster-like forms, are said to be merely globules of opal. In my 1930 paper I said they are not all like that shown in pl. xxii, fig. 4, but that many are much smaller, knobbly or spiny (sterasters or spherasters: there was some confusion in my paper about the use of the term spheraster). Re-examination of my slides confirms the presence of the knobbly ones with a surface resembling that of a blackberry or a familiar type of golf-ball. I have shown Dr. Oakley a specimen of these but can only produce now a photograph of a spiny one. Spheres of medium size sometimes show a trace of this regular, knobbly surface, and I think the largest have lost it through abrasion and solution resulting in pitting.

2. There is no more than a vague resemblance between the star-shaped forms and Lithistid spherasters. This refers to the club-shaped objects and on p. 293 Dr. Oakley suggests that they might have been formed by the infilling of cracks in the volcanic glass by opal. I called these objects “club-shaped” because

in most cases they show one projection longer than the others, suggesting the handle of a club (1930 paper, pl. xxii, figs. 5 and 6). This seems to give a regularity of form more compatible with organic origin.

3. No pointed terminations to the rods, which are the most abundant of the bodies, were observed by Dr. Oakley. Pointed terminations are rare, but I have sent examples for inspection and moreover not all sponge-spicules of the monaxon type are pointed. They may have rounded (strongyle) or knob-like (tylote) terminations. I figured a possible tylote termination in pl. xxii, fig. 7. Again these bodies have been subjected to abrasion and solution, so sharp terminations were not likely to persist.

4. No rods show unmistakable signs of tapering to one end. Pl. xxi, fig. 1, of my paper shows near the top a dark rod tapering to the right. Pl. xxii, fig. 2, shows another that I described as a broken pointed spicule. Re-examination makes me think tapering rods are not very uncommon and they would not be prominent if the bulk of the spicules had been strongyle or tylote.

5. "None (of the rods) shows any signs of an axial canal, which is an essential and striking feature of the unaltered monaxon spicule of a siliceous sponge." I regret that when Dr. Oakley kindly showed me his paper in April, 1940, I did not remember then that I had a slide of a freshwater sponge from the Bedford waterworks. I told him later that the spicules of this sponge, though monaxon, showed no canal, and gathered that if I had done so earlier he would have restricted his statement to marine siliceous sponges. I must confess that the importance of an axial canal had not occurred to me; but when, late in 1941, I acquired a large new bath-sponge, probably from the eastern Mediterranean. I examined the sand from it to test Dr. Oakley's statement further. It contains numerous spicules, broken and entire, which can safely be assumed to be marine. The great majority of the monaxons, easily distinguishable from the calcareous spicules by being isotropic, show under the microscope clearly visible axial canals, sometimes greater in diameter than the wall of the spicule, but it is not difficult to find monaxons with a very narrow canal, with no canal but a visible filamentous axis, or with neither canal nor axis visible under a $\frac{1}{6}$ in. objective. Dr. Oakley has seen one of my slides showing examples.

I am not an authority on sponges and do not know if it is held that the monaxons of all freshwater sponges lack an axial

canal, but would recall that in my 1930 paper I wrote (p. 387) : "In view of the position of the deposit and the associated diatoms I had suggested that the sponges were freshwater species." On pp. 388 and 392 I mentioned spicules in mud from Lake Chini. I have re-examined some slides of this mud and see that the spicules, which are sharply pointed monaxons and obviously of very recent origin, have clearly visible axial canals. They and the very minute spherasters that accompany them are most probably derived from a local, unrecorded freshwater sponge.

Dr. Oakley has recorded in his paper remarks of mine about these bodies that I need not repeat here. With regard to the figures on p. 291, I have not seen anything like A but have seen one object resembling B. In the Tanjong Perak Estate ash I have seen and drawn a few strange objects that resemble vegetable cells with sieve-tubes viewed laterally, but have not seen anything like a sieve-tube in plan.

All these bodies that suggest vegetable origin appear to be distinct from the rods, spheres, and club-shaped objects. Regarding these three latter I have an open mind and shall be grateful if someone can prove whence they are derived ; but Dr. Oakley's arguments fail to convince me that they are not sponge-remains, which is still the simplest solution ; and my observations indicate that the presence or absence of an axial canal is of little diagnostic value. A sponge from Bedford waterworks has monaxons with no canals. Spicules from Lake Chini, also monaxons, and most probably of freshwater origin, show canals. Marine monaxon spicules entangled in a bath-sponge show canals in most cases, but in some show none : they are certainly not essential nor always striking.

For the sake of brevity I have avoided as much as possible repeating things in this letter that I have already said in my 1930 paper, which contains a lot of information and numerous figures. I hope to be able to continue working on these problematical objects, but meanwhile their marine origin is at least uncertain.

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