A TASMANIAN SPECIES OF HALYSITES.

(By R. Etheridge, Jun., Curator of the Australian Museum, Sydney.)

Mr. Thomas Stephens, M.A., F.G.S., has been kind enough to afford me the opportunity of examining a Tasmanian species of *Halysites* from the River Mersey, between Liena and Mole Creeks. Unfortunately, it has undergone so much alteration by secondary replacement that specific identification is rendered very difficult and uncertain.

In 1862 the late Mr. Charles Gould published a report on "Macquarie Heads," giving a list of fossils from the Gordon River Limestone, and mentioned, amongst others, a species of the genus in question.

Mr. Stephens has favoured me with the following extract from the report in question—"The following are the observations* which I made at the last meeting of the Royal Society with regard to the fossils contained in this limestone:—'In these rocks fossils are abundant; they are only conspicuous, however, in that portion of the beds exposed to the action of running water. It is exceedingly difficult to ascertain their presence on a fractured surface, although they may be abundantly concealed in the specimens, and the ordinary atmospheric agencies appear to simply disintegrate the rock without causing the specimen to be exposed in relief, as is the case with many of those upon the table. Hence it follows that the ground for collecting fossils is limited to the surface of the rocks, between the level of the water and about 30ft. above it, the greatest heights to which floods attain—as might be anticipated. The different beds or zones in the formation are not equally fossiliferous, nor do they contain identical species, one part being conspicuous for the abundance of corals, another of univalve shells, while a third is characterised by containing abundant fragments of large chambered orthocerata, etc. I shall briefly enumerate a few of the most striking, characteristic, and best preserved forms:—

Orthoceratites	2
Lituites	1
Halysites	1
Favosites	2
Raphistoma	1
Orthis	1
Rhynchonella	1
Euomphalus...	2
Murchisonia...	3

* Macquarie Harbour—Report of the Government Geologist to Parliament, 29th July, 1862. *Tasmanian Parliamentary Papers, 1862.*

'The collective evidence of these fossils is unmistakable. They are all Silurian, and some of them, especially the Raphistoma and one species of Murchisonia, are Lower Silurian types.

'The lithological character and associations of the strata east and west (that is, across the strike) of this formation is the only evidence of their age, no fossils having yet been discovered in any other of the group of formations comprised in the western country, except the Silurian mudstones, etc., of the Eldon River. There can, however, be little doubt that they are none of them later than Silurian, while some are evidently referable to the very earliest epochs.'"

To this extract Mr. Stephens adds the following note:—"This is an extract from a Parliamentary Paper containing Mr. Gould's Report on the geology of the country east of Macquarie Harbour, including the limestones of the Gordon River. The passage marked by single inverted commas appears to have been read at a meeting of the Royal Society, but is not printed among its papers."

In Mr. Stephens' specimen, the fasciculo-reticulate corallum measures two and a half wide by three inches long. The intersecting reticulations, or fenestrules, as in the recently described *H. australis*, mihi,† are variable in size and shape, but again, as in the latter, are round, oval, transversely elongated, irregular, or polygonal (hexagonal and pentagonal), varying in size from six millimetres by four, up to eleven by eight millimetres, and even twenty-five by three, with intermediate gradations, and a like variability in the angles of junction of the various plates comprising the corallum. As a rule, the reticulations are longer in one direction than the other, but this does not always hold good.

The coral is exposed on the weathered surface of a piece of limestone, and only in a few places can the inner surfaces of the plates be seen, where they project above the surface of the matrix, and are covered by Beekite rosettes. This alteration and weathering have so far destroyed the finer points of structure that it is not possible to ascertain the number of corallites with accuracy in any one interstice, but sufficient remains to indicate that they were numerous. In a few instances the inter-corallite walls are still visible; these are trenchant and narrow, leaving no room for the presence of interstitial corallites, similar to those of the well-known *H. catenulatus*, Linn. The whole of the corallites seem, therefore, to be "normal," and indicate that we are dealing with a species of the *H. escharoides* group, as distinguished from those forms in which there are both normal and interstitial corallites, typified by the species first mentioned.

† Rec. Austr. Mus. 1898, iii, No. 4, p. 78.

These normal corallites, in the present specimen, average one millimetre in length, in the direction of the chain.

The alteration that the tissues have undergone is even of a more rigorous nature than that described by me in *Halysites australis*. The walls are thickened, in places inordinately so, the original tissues where visible being composed of grey or brown sclerenchyma, but for long distances, several millimetres in fact, the entire wall is replaced by blebs of chalcedonic quartz that have quite destroyed the original matter. At times, although much less frequently, the inter-corallite walls are similarly effaced, but the tabulæ never. In one particular corallite this thickening has progressed so far as to practically reduce the visceral channel to a mere narrow tube, and another has been similarly reduced by chalcedonic blebs.

In a horizontal section prepared for the microscope, where least alteration has taken place, the corallites are seen to be oval in outline, the inter-corallite walls apparently stout and solid, and without any definite proof of the presence of interstitial corallites in them, a very important feature in the structure of *Halysites*. Here and there are traces of the cut edges of tabulæ, and scattered around the edges of the visceral chambers small round bodies are not infrequently seen, of the same colour and texture as the sclerenchyma of the walls. These have a very suspicious resemblance to the distal extremities of septa protruding through the infilling calcite from a lower level, as is so frequently seen in corals of a Favositoid nature. In more than one instance, I believe I can detect a process protruding more or less horizontally from the wall just as a spiniform septum should. There is some reason to believe, therefore, that we are here dealing with a septate form, and consequently, in the additional absence of interstitial corallites, with one allied rather to *Halysites escharoides* than *H. catenulatus*, for in these two points lie the great distinction between the species in question.

In a vertical section, similarly prepared, I have also quite failed to detect any interstitial corallites. The tabulæ are well developed and complete, concave, and from three to four in the space of one millimetre.

The conclusions I am led to by an examination of this coral, and making all allowance for its state of preservation, are—(1) That it is distinct from *Halysites australis*, mihi (2) that it appertains to the group of *H. escharoides*, rather than to that of *H. catenulatus*; (3) whether it is identical with the European *H. escharoides* is a more difficult question to answer, but I am inclined to think not.

This last opinion is based on the much greater size of the reticulations formed by the laminæ, and a laxer form of

growth, in this respect corresponding to *H. australis*. This alone, however, cannot be relied on for specific separation, for in the American form ascribed to *H. escharoides* by the late Prof. James Hall,‡ these particular features differ very greatly from those figured and described in typical European examples by Messrs. Milne-Edwards and Haime.§

Under these circumstances I refrain from passing any positive opinion as to the coral's specific identity until I have had an opportunity of examining better preserved examples.

‡ Pal. New York, 1852, ii. t. 35.

§ Brit. Foss. Corals, Pt. 5, 1854, p. 272, t. 64, f. 2 and 2a.