ON THE GENUS KRAUSSINA IN TASMANIA.

By W. H. Twelvetrees and W. F. Petterd.

In 1852 the late Dr. Davidson established the genus Kraussia (which he afterwards altered to Kraussina) for a small terebratuloid brachiopod with diminutive arms and a very insignificant brachial support, consisting of two divergent lamellae or lateral processes branching off right and left from the median septum of the dorsal valve. The genus now accommodates seven species, all recent, viz.:—

Kraussina rubra, *Pallas.* Found off Natal and Port Elizabeth, South Africa.

„ Cognata, *Sowerby.* Found off Cape of Good Hope.

„ Deshayesi, *Davidson.* Found off Cape of Good Hope, 120 fathoms.

„ pisum, *Valenciennes.* Found off Cape of Good Hope, 150 fathoms.

„ Davidsoni, *Vélain.* Found at the Island of St. Paul, low water mark.

„ Lamarckiana, *Davidson.* Found at Port Jackson, N.S.W.; S.E. Australia ; New Zealand ; Mouth of River Tamar and in Long Bay, Tasmania.

„ Atkinsoni, *Tenison Woods.* Found Long Bay, South Tasmania, 10 fathoms.

Professor Deslongchamps has carried K. Lamarckiana and K. Davidsoni over to a sub-genus Megerlina, possessing two rudimentary septum processes underneath the calcareous forks supporting the brachial (or more strictly speaking, labial) appendages.

The two Tasmanian species have engaged our attention. The discovery of comparatively smooth individuals of what appear to be K. Lamarckiana at George Town, near the mouth of the Tamar, has suggested an inquiry as to whether these really belong to that species, and if so, what are the real differences between them and K. Atkinsoni. At the time of Davidson's last monograph, the latter was regarded as the sole smooth species of its genus.

Kraussina lamarckiana is frequent at George Town and between there and the Tamar Heads, at and below low water mark, attached to rocks and large stones. Though the shells

are apt to escape notice, when once they have been recognised they are afterwards easy of detection. The peduncle is very short, and consequently the shell adheres to the rock rather closely. The species has not been recorded elsewhere along the northern coast of Tasmania, and this is quite in accordance with what often happens in the distribution of brachiopoda. Owing probably to their sedentary habit, numerous individuals of a species are found confined to a small area, while they are absent over the wide distances which separate different colonies of the animals. The Rev. H. D. Atkinson, B.A., informs us that he has dredged specimens in the south of the island in D'Entrecasteaux Channel, but that he has never met with any on the North-West Coast.

The shell is sub-circular in form and generally strongly ribbed. In the smooth variety, however, the pedunculated valve is somewhat sub-trigonal. This difference, though slight, is sufficient to enable us to separate a collection of both kinds at a glance into two series without even paying attention to the presence or absence of ribs. We have subjected the shell of both varieties to microscopical examination in thin sections, but cannot declare any difference in the pattern or size of the perforations. The average diameter of the shell canals is $\frac{1}{900}''$ to $\frac{1}{1000}''$, and they are mostly $\frac{1}{500}''$ to $\frac{1}{700}''$ apart, measured from centre to centre. Their diameter, where they open on the external surface, is about $\frac{1}{350}''$. We append illustrations of the perforations found in the Tasmanian shells of this genus. The figures being photographic and not diagrammatic, may be looked upon as trustworthy representations of these singular structures, considered at various times as connected with sensory organs, with respiratory organs, and with processes of nutrition. After all that has been written on the subject, their function is still unsettled. Structurally the perforations are cross sections of vertical or oblique canals in the shell, which receive caecal prolongations of the mantle of the animal.

In this species the brachial apparatus does not materially change with age, and we profess ourselves unable to detect any decided variation in the form of the calcareous lamellae of the smooth and ribbed shells. These supports are minute, and the brachial (or oral) appendages are correspondingly small, being comprised altogether in the central area of the shell. In shape the oral arms are incurved cirrhated tubes, the cirri of which are about 1/30″ long, and from $\frac{1}{700}$ to $\frac{1}{1000}''$ in diameter. The cirri themselves are hollow tubes, with acuminate terminations and a wavy habit.

Professor E. Deslongchamps in separating Kraussina, Megerlia, Terebratulina, Listhyris, and Platydia from the

other brachiopoda, calls attention to the presence of calcareous spicula in their mantle and its appendages. It is not altogether certain that this is a reliable character for forming large groups, and it has yet to be proved that it is of value even for generic distinctions. From sections which have been made for us by Mr. F. E. Furbury, of Launceston, we observe that the fleshy substance of the oral arm in K. Lamarckiana is strengthened in a remarkable manner by an interlocking mass of branching and denticulate spicula, often of a staghorn form. These do not form a continuous network, but with care can be disarticulated. Evidently this internal skeleton, as it may be called, supports and fortifies the arms, and is mostly found in the animals which have only short brachial supports, the place of which they thus take to some extent.

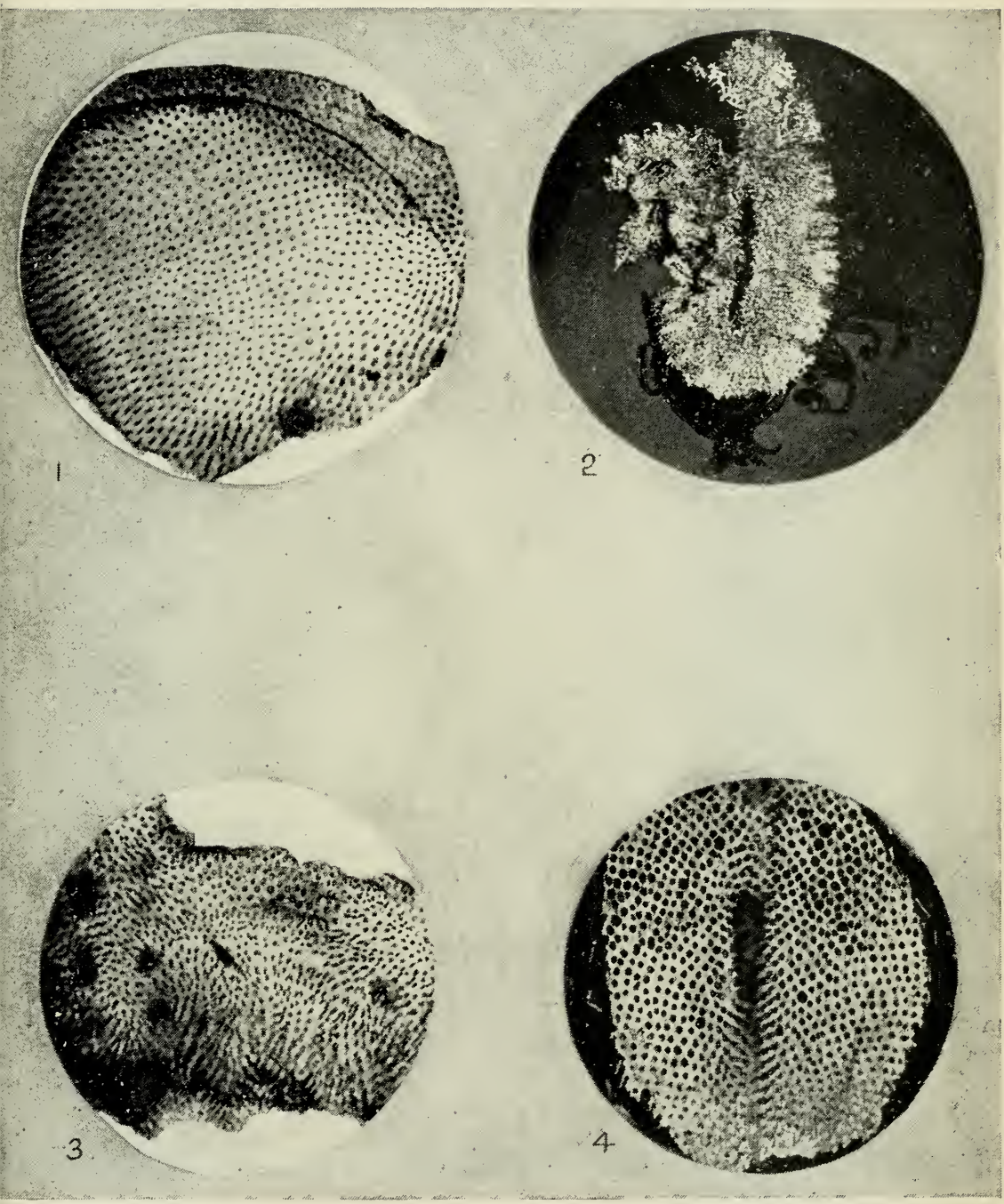
From what we have gathered from our observations detailed above, we are inclined to regard the smooth shell as nothing more than a varietal form of Kraussina Lamarckiana.

Kraussina Atkinsoni.—This small shell, catalogued by Tenison-Woods, was dredged by the Rev. H. D. Atkinson in Long Bay, D'Entrecasteaux Channel. Dr. Davidson says it is the only smooth Kraussina known to him, but as we have just shown, K. Lamarckiana embraces a smooth variety. Davidson has described the shell completely in his monograph of Recent Brachiopoda (p. 127), and we need not repeat what he has done so well. Several specimens have been kindly placed at our disposal by the Rev. H. D. Atkinson, and we have consequently been able to examine thoroughly this little-known shell. The differences between its brachial support, and that of K. Lamarckiana, may be summed up by saying that its lateral lamellae are on a horizontal plane, instead of being directed slightly downwards, and the shape of these is strap-like instead of being swollen as in K. Lamarckiana. The shell canals, too, are unusually large, as may be seen in our illustration. Unfortunately the animal was absent from the valves entrusted to us, and consequently we have to regret not being able to demonstrate the characters of the spicula of this little-known species. That it is a good species, and not a mere variety of K. Lamarckiana, the material at our command is, as we think, sufficient to establish.

Explanation of Plate.

Fig. 1.—Transverse section of shell canals of Kraussina Lamarckiana, smooth variety, taken near surface of shell. ×17. Ordinary light.

Fig. 2.—Oral arm of Kraussina Lamarckiana ×17. The photograph has been taken in polarised light, which illumi-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nates the branching network of white spicula, while the fleshy cirri are left dark, and only dimly visible. This method of illumination very effectively demonstrates the way in which the internal spicular skeleton strengthens the arms.

Fig. 3.—Transverse section of shell canals of Kraussina Lamarckiana (the typical ribbed kind). This represents nearly the whole thickness of the shell, and shows the oblique direction of the tubular canals × 17. Ordinary light.

Fig. 4.—Transverse section of shell canals of Kraussina Atkinsoni. Although the shell is somewhat smaller than K. Lamarckiana, the canals are considerably wider. The dark line in the centre is the mesial septum. × 17. Polarised light.