I further assume that in this case, as also in Aphrodite, these cells are in connection with the digestive functions of the sponge, and take up and absorb microscopic food-particles, which may get into the lacunæ of the inhalent system, and there come in contact with the epithelium.

GEOGRAPHICAL DISTRIBUTION.

East Coast of Australia, Port Jackson (Ramsay.)

BATHYMETRICAL DISTRIBUTION.

40 metres.

The type specimens of this sponge are in the Australian Museum, Sydney.

III.—HALME TINGENS.

A SPONGE WITH REMARKABLE COLOURING POWER.

Among the sponges sent by Dr. Haacke from Thursday Island, is a new species of my genus Halme.

HALME TINGENS. Nov. spec.

Sponge composed of reticulate lamella, massive 200 x 300 x 100 mm. large. No dermal lamella. Meshes on an average 12 mm. wide. Lamella curved 2-3 mm. thick, covered with small conuli. Very little sand in the skin. Skeleton composed of very distant fine fibres. Radial main fibres charged with foreign bodies and tangental connecting fibres free from such. Colour in spirits at first white, then violet.

The spirit extracts a yellow colour from the sponge, which appears to remain in solution in the spirits. This sponge was dredged by Dr. Haacke at Thursday Island.

It is an intermediate form connecting the sub-family Auleninæ with the genus Hippospongia.

Halme tingens is very peculiar inasmuch as it colours paper and other substances with a dark violet tint. If paper is inserted in a bottle containing this sponge and spirits, it will be

found that the paper, after a day or two, is stained a deep violet blue. A colour which will not disappear when the paper is washed with water or ether. Concentrated acids and strong alkalis affect the colour. Acids make it red like litmus. Alkalis turn the red colour blue again.

I do not know anything about the chemical nature of the colour. It is very remarkable that the spirits are only stained light yellow by the sponge. It appears that the colour is precipitated on the paper, &c., after it has been extracted from the sponge by the spirits.

It appears that a great quantity of paper, &c., can be stained by a very small piece of the sponge, and I think that possibly this discovery might be turned to practical account for the purpose of dyeing blue-violet.

IV. TWO CASES OF MIMICRY IN SPONGES.

In the cases in question two species of horny sponges imitate two species of Siliceous sponges. As both the two imitating and also the two imitated sponges are new species, it will be necessary to give a short description of them first.

GENUS. CHALINOPSIS.

Sponges which belong to the family Spongidæ, sub-family Chalinopsinæ which imitate the shape of Chalinidæ, more or less closely, and which have a light and tender skeleton composed of radial main and tangental connecting fibres without conuli and without vestibule spaces. The skeleton is more or less grey in the dry state. Sponges of digitate shape.

CHALINOPSIS IMITANS. Nova species.

Digitate processes regular smooth and cylindrical, very long and slender, slightly branched. Oscula very small. Digitate processes tapering to a more or less sharp point. The sponge is attached by a short thick stem.

Thickness of digitate processes 8 mm., length 600 mm. The whole sponge hard and elastic.

Locality : East Coast of Australia, Illawarra.

This species is represented in fig. 19.

CHALINOPSIS DICHOTOMA. Nov spec.

Digitate processes cylindrical of not very uniform diameter, repeatedly branched in a dichotomous manner. The whole sponge attached by a thin stem.

Oscula large and very numerous. Digitate processes 12 mm. thick, tending to extend in one plain, particularly at the points of ramification. Irregular digitate and conic processes on the surface. Sponge 400 mm. long.

Locality : West Coast of Australia, Western Australia.

This sponge is represented in fig. 21.

GENUS. DACTYLOCHALINA.

Sponges belonging to the Monactinellæ. Skeleton composed of a hexactinellid network of horny fibres. Meshes pretty small. An extremely fine network of slender threads with very small meshes on the surface.

Very small and slender spicules *ac. ac.* straight or slightly curved are found in the axis of the horny fibres. These spicules are not numerous. They are more scarce in the connecting than in the main fibres. They are found also in the fibres of the fine surface-net.

Sponges with digitate processes.

DACTYLOCHALINA CYLINDRICA. Nov spec.

Digitate processes nearly straight, slightly branched, growing in a penicillate manner parallel from the expanding branches at the base. They coalesce here and there, where they accidentally touch. They are slightly undulating, regularly cylindrical and 7 mm. thick. They terminate with rounded ends. Oscula small, common stem short and thick. Length of sponge 500 mm.

Locality : East Coast of Australia, Port Jackson.

This sponge is represented in fig. 20.

DACTYLOCHALINA RETICULATA. Nov. spec.

Digitate processes irregular, repeatedly branched and anastomosing, 12 mm. thick, more or less cylindrical, with an uneven surface, and much curved. Tapering at the tips to a pointed terminus. Length of the sponge 200 mm.. Oscula large, scattered over the surface.

Locality : East Coast of Australia, Port Jackson.

This sponge is represented in fig. 22.

When working out the sponges I was so deluded by the external similarity of these sponges, as actually to put Chalinopsis imitans and Dactylochalina cylindrica, and also Chalinopsis dichotoma and Dactylochalina reticulata specimens together. Only afterwards I ascertained by examining sections of different specimens under the microscope, that I had confounded sponges belonging to two different orders with one another.

All the representatives of my sub-family Chalinopsinæ of the family Spongidæ, are more or less similar to species of Chalinidæ-Monactinellid sponges. The most striking similarity however, is shown by the four species described above.

The similarity could be accounted for in various ways. We might assume that the Chalinopsidæ where the links connecting the Ceraospongia with the Monactinellidæ. In this case we would have to assume that either the horny sponges have descended from the silicious, and that the Chalinopsinæ were horny sponges which had been just produced by the loss of the silicious spicules in the fibres of the similar Chalinidæ, or that *vice versa* the Chalinidæ are descended from horny sponges, and that these forms are the ones just commencing to obtain spicules. We might also assume that these sponges were not at all related with each other.

I have some years ago advocated the view, that silicious sponges descended from horny ones, the evidence however, which has since then been brought forward seems to indicate that the silicious sponges are the ancestors of the horny ones, a view advocated by Vosmær and Poléjaeff.

I think that the Chalinopsinæ are very nearly allied to the Chalinidæ, but I do not think that they are so nearly related to each other as the similarity of their outer appearance would indicate. It seems most probable that the two species of Chalinopsis described above are descendants of digitate Chalinidæ, they have lost the defensive spicules which are no doubt of great value to Dactylochalina, but they have retained the outer appearance. It is probable that the Dactylochalina species have undergone changes since then, and that these species of Chalinopsis have had to change their own shape accordingly so as always to remain similar to a defensive sponge. I would therefore call the similarity in these two cases, although it has originated in true relationship, Mimicry, because the structure of the important internal organs has changed, whilst no difference is perceptible in the outer appearance which is so very variable in sponges.

EXPLANATION OF PLATES.

Plate, 39.

Fig. 1.—*Dendrilla cavernosa.* R. v. L.
Section through the sponge.
$\frac{1}{4}$th of the natural size.

Fig. 2.—*Dendrilla cavernosa.* R. v. L.
Pore membrane covering the vestibule lacunæ. Seen from the surface.
1:20 magnified.
Alcohol, Hæmatoxylin specimen.

Fig. 3.—*Dendrilla cavernosa.* R. v. L.
Pore membrane covering the vestibule lacunæ. Seen from above. Margin of one of the pores.
1:20 magnified.
Alcohol, Hæmatoxylin specimen.

Fig. 4.—*Dendrilla cavernosa.* R. v. L.
Transverse section through the pore membrane. Showing one pore.
1:80 magnified.
Alcohol, Hæmatoxylin.

Fig. 5.—*Dendrilla cavernosa.* R. v. L.
Transverse section through the pore membrane showing the margin of a pore.
1:800 magnified.
Alcohol, Hæmatoxylin specimen.
(a.) Amœboid wandering cells.
(m.) Muscular cells.
(g.) Ganglia cells.
(d) Gland cells.
(s.) Sensitive cells.
(p.) Flat epithel cells.

Plate 40.

Fig. 6.—*Raphyrus Hixonii.* R. v. L.
Photographed from life.
En profil.
$\frac{1}{8}$ of the natural size.

Plate 41.

Fig. 7.—*Raphyrus Hixonii.* R. v. L.
Transverse section through the outer portion of the sponge
1:50 magnified.
Alcohol, Hæmotoxylin.

Fig. 8.—*Raphyrus Hixonii.* R. v. L.
Some of the digestive amœboid wandering cells in the soft tissue of the internal meshes.
Spirit specimen.
1:400 magnified.

Plate 42.

Fig. 9.—*Raphyrus Hixonii.* R. v. L.
Transverse section through the outer portion of the sponge.
1:15 magnified.
Alcohol, Hæmatoxylin.

Fig. 10.—*Raphyrus Hixonii.* R. v. L.
Bulb ac. spicule.
Most frequent shape in the supporting skeleton of the network.
1:150 magnified.

Fig. 11.—*Raphyrus Hixonii.* R. v. L.
Bulb ac. spicule. The head showing a spine.
1:250 magnified.

Fig. 12.—*Raphyrus Hixonii.* R. v. L.
Bulb ac. spicule, with a large spine. The head.
200:1 magnified.

Fig. 13.—*Raphyrus Hixonii.* R. v. L.
Bulb ac. spicule, the truncate end showing the extended terminus of the axial canal.
1:500 magnified.

Fig. 14.—*Raphyrus Hixonii.* R. v. L.
Tr. tr. sp. spicule of the dermal armour. Straight kind.
1:700 magnified.

Fig. 15.—*Raphyrus Hixonii.* R. v. L.
Tr. tr. sp. spicule of the dermal armour. Curved kind.
1:700 magnified.

Fig. 16.—*Raphyrus Hixonii.* R. v. L.
Ac. ac. sp. spicule of the soft tissue.
1:400 magnified.

Fig. 17.—*Raphyrus Hixonii.* R. v. L.
Tr. ac. spicule.
150:1 magnified.

PLATE 43.

Fig. 18.—*Chalinopsis imitatus.* R. v. L.
Photographed from a skeleton.
$\frac{1}{8}$ of the natural size.

Fig. 19.—*Dactylochalina cylindrica.* R. v. L.
Photographed from a skeleton.
$\frac{1}{2}$ of the natural size.

PLATE 44.

Fig. 20.—*Chalinopsis dichotoma.* R. v. L.
Photographed from a skeleton.
$\frac{1}{2}$ of the natural size.

Fig. 21.—*Dactylochalina reticulata.* R. v. L.
Photographed from a skeleton.
$\frac{1}{8}$ of the natural size.

DESCRIPTIONS OF NEW OR RARE AUSTRALIAN FISHES.

BY E. PIERSON RAMSAY, F.R.S.E., AND J. DOUGLAS-OGILBY.

PTEROPLATEA AUSTRALIS. sp. nov.

Disk rather less than twice as wide as long; tail three-eighths of the length of the disk, without spine or rudimentary fin, but with faint indications of a cutaneous fold above and below. Spiracle provided with a tentacle. Teeth with a long median and two short lateral cusps. Skin smooth. Dark-brown, almost black above; white beneath; tail with two interrupted white rings about midway.

This fine species, belonging to a genus hitherto unknown from Australia, was forwarded some years ago by Mr. J. Brown from Cape Hawke, N. S. Wales, and measures twenty-three inches across the disk.

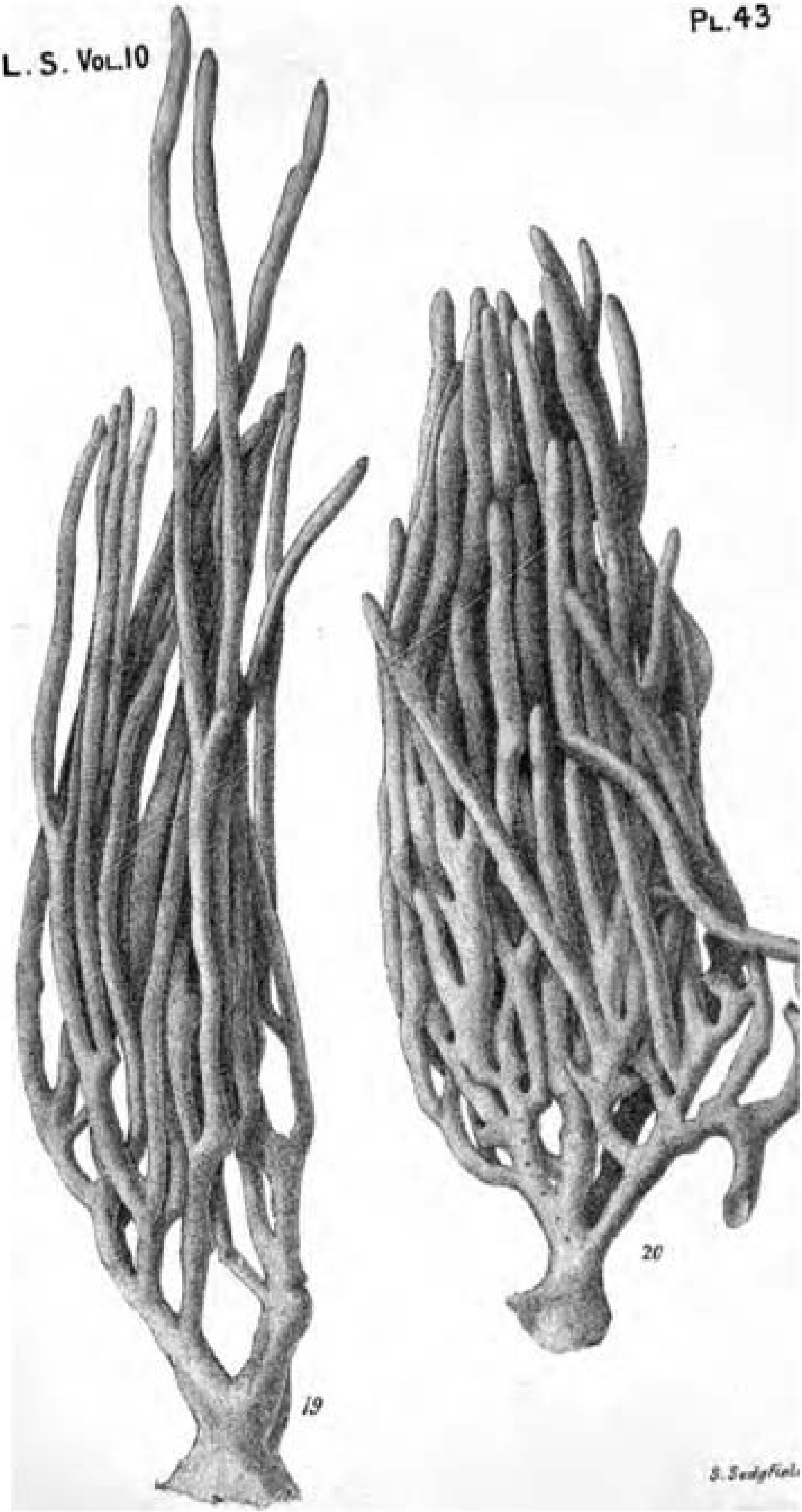
It is possible that this may be identical with the Mediterranean *P. altavela*, but in the absence of books of reference it is impossible to settle the question satisfactorily owing to the insufficient description given in the British Museum Catalogue.

Registered number in the Australian Museum A. 9357.

CIRRHITICHTHYS APRINUS, C. & V.

. VI. D. 10/12-13. A. 3/6-7. V. 1/5. P. 7/7 or 8/6
5. L. lat. 42. L. trans. 4/11.

ngth of head rather more than 4, of caudal fin $5\frac{1}{3}$, height of body the total length. Diameter of eye $\frac{1}{4}$ of the length of the and $\frac{4}{7}$ of that of snout. Interorbital space concave, from $\frac{2}{3}$ to the diameter of eye. Cleft of mouth oblique. Maxilla reaches vertical from anterior margin of eye. Preorbital and post- al serrated. Vertical limb of preopercle strongly serrated;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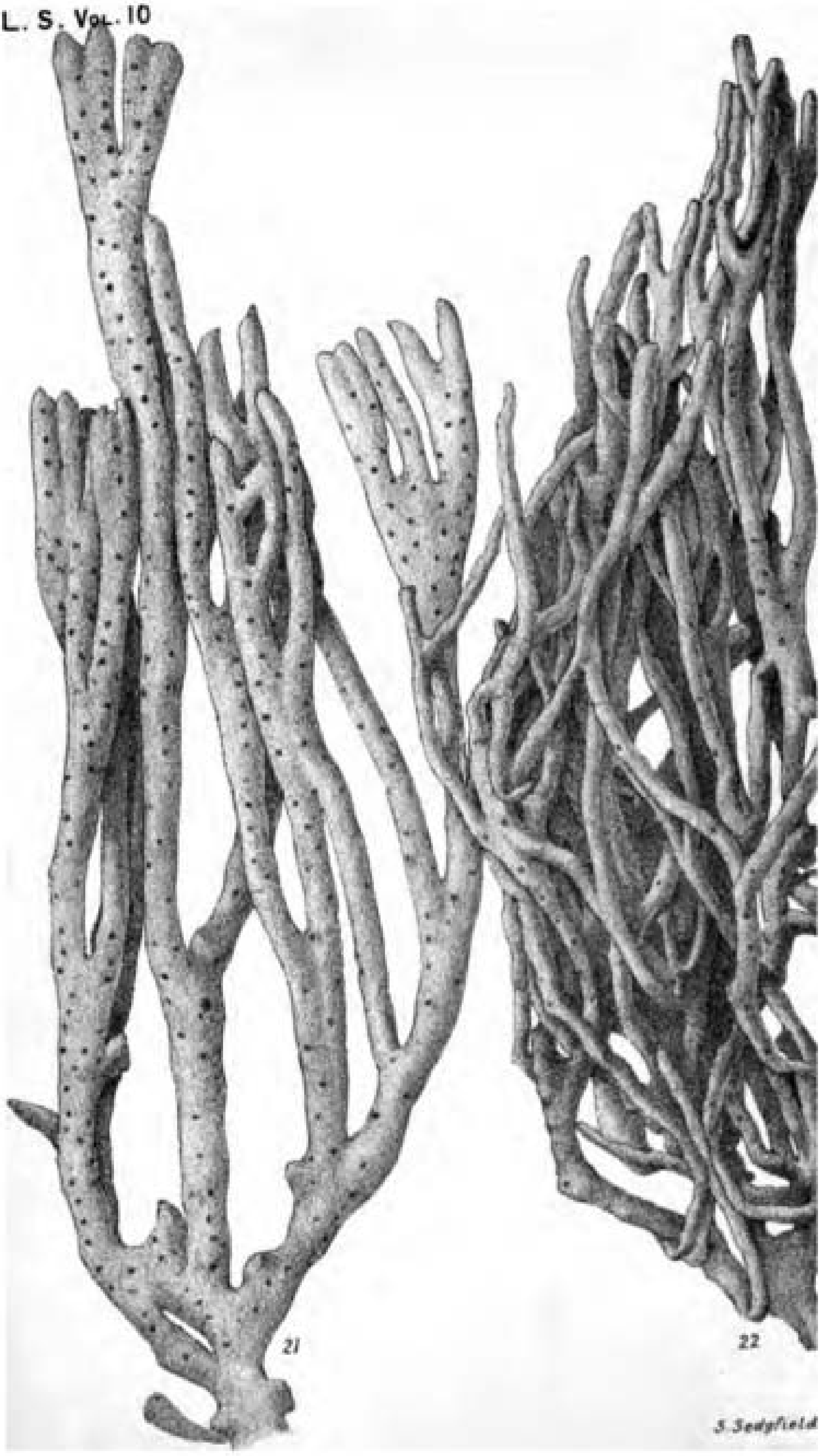
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