plausible explanation of the occurrence of the above-described albino duck, I gladly publish it as received :—

Writing on the 16th August, 1914, Mr. Kempthorne says, " I have just noticed a paragraph on page 9 of *Otago Witness* of the 12th August about an albino wild duck having been shot. I dare say you will be interested in a very probable explanation of this curiosity. At my mother's place (" Parkdale," Heriot) there is a large pond which for twenty years has been a sanctuary for the wild duck (it being on private property, and my mother's wishes that no shooting shall be allowed, have made it such). In wet weather hundreds of ducks gather there, and the ducks bred there make it their home. For years there were white tame ducks also, but they dwindled in number until only one drake remained. This drake mated with a wild grey duck that was unable to fly (or could fly very little) and necessarily had to live entirely at the pond. I remember four or five years ago coming on a mixed clutch of ducklings (whites and greys), but after seeing them two or three times I never saw them again, and concluded that a weasel had accounted for them. On a recent visit to " Parkdale " (three weeks ago) I saw an albino wild duck, and my brother said there were more than one. It could fly, as I made it my business to frighten it and see. Evidently the tame white drake and the crippled wild duck had mated again, and their progeny had lived. The distance between Heriot and Mataura in a direct line would be thirty-odd miles, and this would not be an excessive distance for the flight of a wild duck. The tame Indian runner duck and the wild grey duck mate without trouble, but this is the only case I have heard of a white tame duck mating with a wild grey duck. It would be interesting to test the case again on the wild grey ducks in the Botanical Gardens. The two ducks would have to be shut together continuously for a lengthened period to ensure a satisfactory result."

Art. XVII.—*On* Ascidioclava, *a New Genus of Gymnoblastic Hydroids.*

By Professor H. B. Kirk, M.A., Victoria University College, Wellington.

[*Read before the Wellington Philosophical Society, 26th October, 1914.*]

Plate I.

Characters of the Genus.

Trophosome.—A creeping hydrorhiza, branching freely, gives rise to unbranching hydrocauli, each terminating in a hydranth. Hydranths with filiform tentacles not in definite whorls, but tending to be arranged in three or four whorls. Perisarc entirely wanting.

Gonosome.—Medusa buds produced in clusters near the base of the hydranth, whether becoming free or not at present uncertain ; tentacles rounded.

Ascidioclava parasitica n. sp. Plate I.

Height of hydrocaulus and hydranth together, 2–3 mm. Tentacles of adult hydranth, 20 or more in number ; average length of tentacles, 0·4 mm. ; the widest part of the tentacle a little above the base, the tentacle then tapering to the tip, where the diameter is about half that of the widest part. Hydrorhiza branching freely and anastomozing, the branches becoming concrescent, with absorption of ectoderm and mesogloea at the points of contact, giving a continuous coenosarcal sheet. Endoderm of hydrorhizal

portion greatly developed, and cavities completely obliterated. Medusa buds shortly pedunculate, the hollow peduncle containing a prolongation of the gastro-vascular cavity. Gonads at present unobserved.

Ascidioclava parasitica presents in both trophosome and gonosome anatomical characters that seem to me of interest. I note here the most striking of these.

Trophosome.—The ectoderm shows great differences in the different parts. On the tentacles and the hypostome it is cellular, and presents no special features. Below the tentacles the ectoderm of the hydranth shows nuclei and fragments of nuclei arranged indiscriminately, often three or four deep. Cell-outlines have quite disappeared (fig. 2). In this part the ectoderm somewhat resembles that of *Clava squamata* as figured by Allman.*

Towards the base of the hydranth this thickened ectoderm thins out to form the thin non-cellular membranous ectoderm of the hydrocaulus. Through this membrane the outline of the bases of the endoderm cells, changed as noted below, can be seen, giving the appearance of a fine irregular network. The ectoderm of the upper surface of the hydrorhiza is thin and nuclei are sparse. On the lower surface, where it is in contact with the epithelium of the host, the ectoderm consists of columnar cells with very clearly marked outline (fig. 4). In no part of the organism have I been able to discover any trace of a chitinous secretion.

The mesogloea is everywhere thin, and almost membranous.

The endoderm of the hypostome comprises a large number of glandular cells, and these decrease in number towards the lower part of the hydranth (fig. 2). In the hydrocaulus the endoderm cells are reduced to large thin-walled vacuoles. Only occasionally can a shrivelled nucleus be found adhering to the cell-membrane. Towards the base of the hydrocaulus these gradually give place to living cells with highly granular protoplasm. These encroach upon the cavity until, at the very base of the hydrocaulus, it is completely obliterated. This obliteration of the cavity marks the hydrorhiza also, and when the dividing walls become absorbed there is a continuous sheet of endoderm surrounded by the thin mesogloea and the ectoderm (fig. 4).

The large vacuolated endodermal core of the tentacles is very well developed. These cells, like the clear endoderm cells of the hydrocaulus, usually contain each a single vacuole. Allman† says with regard to the central endoderm of tentacles, "It would seem that the solid axial tissue of the tentacles is in every instance separated by the mesosarc, not only from the ectodermal layer of the tentacles, but, by a duplicature of the mesosarc, from the endoderm which lines the body-cavity of the hydranth, as was first pointed out by von Koch in *Tubularia*." I can find no trace of such an arrangement here. The axial endoderm of the tentacles appears to me to rest unmistakably on the endoderm of the gastro-vascular cavity of the hydranth (fig. 2).

Gonosome.—Medusa buds are produced singly, or more often in groups of from two to four, near the base of the hydranth. I have not found more than one group on any hydranth. Material collected from October to December does not enable me to say with certainty whether the medusa becomes free. A single medusa better developed than the rest was found unattached, but it is possible that it became detached in the removal of the hydroid from its host. It still showed the scar at the point at which it had been attached.

* "A Monograph of the Gymnoblastic or Tubularian Hydroids," pt. i, pl. i, 1871.

† "Report on the Hydroida dredged by H.M.S. 'Challenger,'" p. x, 1888.

The medusa buds are shortly stalked, and the stalk contains a stomochord. There are four very short, blunt tentacles, one opposite the end of each radial canal. The medusa bud (fig. 5) is campanulate. The manubrium is pear-shaped, with the mouth at the narrow end. Scattered sparingly are enormous nematocysts, which are seen in section to project downwards into the mesogloea (fig. 6). Cross-section shows on the surface of the ex-umbrella four interradial grooves. In the detached specimen mentioned above small bodies are developing on the margin of the bell opposite the ends of these grooves. These bodies will probably prove to be statocysts.

The ectoderm of the ex-umbrella consists of flattened cells. At the extremity of the tentacles these give place to columnar cells, many of which are nematoblasts. The inner ends of these cells are dark with granules, but are not pigmented. There is probably no reason to regard these extremities of the tentacles as ocelli. Longitudinal section shows that the tentacle contains a central mass of cells that look much like nerve-cells; but these are cut off from the ectoderm by mesogloea. They are large vacuolated cells of the endoderm, with well-developed nuclei. The nuclei are surrounded by an envelope of protoplasm, from which envelope strands cross the vacuole to the opposite wall. The mass is in direct continuation with the endoderm that lines the radial canal, and is a specialized portion of the endoderm lamella. It is possible that the condition of these cells is preparatory to the hollow state of the tentacles that characterizes the *Clavidae;* but if a hollow were to be developed on lines at present suggested by the appearance of the section the result would be a hollow lined by mesogloea, which is not at all likely to occur. Longitudinal section taken between the radials shows no circular canal, which probably develops later.

The ectoderm of the sub-umbrella consists of columnar cells, differing in length. The result is an epithelium somewhat resembling in appearance the endoderm of the gastro-vascular cavity of the hydranth. The ectoderm cells about the mouth and the lower portion of the manubrium are columnar cells of great size, many of them nematoblasts.

None of the specimens sectioned show gonads, and it may be presumed that they are immature.

Ascidioclava parasitica is found in the peripharyngeal groove of an Ascidian (a species of *Polycarpa*) that occurs below low-water mark in Wellington Harbour. It, or an allied form, occurs sometimes, at all events, in the stalked Ascidian *Boltenia pachydermatina*. It is sometimes present in such abundance as almost to fill the peripharyngeal groove of the host. Attachment is very slight. I have frequently found small masses or detached portions in the pharynx of the host or in the stomach; but these were always dead and more or less macerated, or partially digested.

The infrequency of parasitism among the members of the class adds to the interest of this form.

All drawings made with Abbé apparatus.

EXPLANATION OF PLATE I.

Fig. 1. *Ascidioclava parasitica*, enlarged.
Fig. 2. Section of body-wall of hydranth. *gl.*, gland-cell of endoderm.
Fig. 3. Section of body-wall of lower part of hydranth and upper part of hydrocaulus.
Fig. 4. Section of base of hydrocaulus and adjacent portion of coenosarc. *end.*, endoderm; *m.*, mesogloea; *ect.*, ectoderm.
Fig. 5. Medusa buds.
Fig. 6. Section of tentacle and part of umbrella. *m.*, mesogloea; *nb.*, nematoblast; *v.*, velum; *ex.n.*, ex-umbral nerve ring; *r.c.*, radial canal.