the zoœcium, or cell. To this view of Allman I must completely assent, though I cannot go so far as to regard likewise the ovarium and the testis as distinct zooïds.

Indeed I look upon every colony of "Bryozoa entoprocta"[1] as being a compound animal ("Thierstock"), composed of two different classes of zooïds, the "cystoid zooïds" and the "polypoid zooïds." The cystoid zooïds assume very different shapes, their various forms causing the great diversity of the external form of the Bryozoa. In this group are to be reckoned—

1. The cœnœcium of the Phylactolæmata, showing not yet separated lodges (Lophopus), and the cells or zoœcia of the Phylactolæmata with distinct lodges, Chilostomata, Ctenostomata, and Cyclostomata.
2. The avicularia of the Chilostomata.
3. The ovicells or oœcia of the Chilostomata.
4. The vibracularia of the Chilostomata.
5. The stem-joints of the Vesiculariadæ.
6. A part of the spines and root filaments of the Chilostomata and Ctenostomata (?).

The primary zooïd of every colony is a cystoid zooïd produced by a direct metamorphosis of a ciliated larva.

The polypoïd zooïds are always produced by a process of budding from the inner side of the endocyst of a cystoid zooïd; but since only the two first-mentioned modifications of cystoid zooïds are endowed with the faculty of producing polypoid buds, there are only two forms of polypoid zooïds:

1. The common polypide, generally considered as the intestinal apparatus, and the tentacular crown of the polyzoon.
2. The round bodies, bearing a brush of sensible setæ, in the avicularia of some species.[2]

The cystoid zooïds are intrusted with the whole amount of reproductive functions, both sexual and asexual, the polypoid zooïds providing for the nutritition, the respiration, and the sensitive functions, the functions of the polypides of the avicularia being limited to the latter function.

Lastly, I must state that I cannot find any adequate reason to regard the so-called "nervous system of the colony" as a true nervous organ.

A more elaborate account of the facts leading me to this conviction I shall give in a subsequent paper.

Leipzig, 1st February, 1871.

[1] H. Nitsche, 'Beiträge zur Kenntniss d. Bryozoen. Zeitschrift für Wissenschaftliche Zoologie,' v. xx, p. 34.

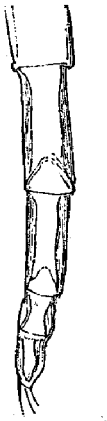
[2] Busk, "On Avicularia," 'Quarterly Journal of Microscopical Science,' New Series, Vol. II, 1854, p. 26, Pl. II.

On some Species *of* Parasites *hitherto undescribed.* By Alexander Macalister, Professor of Zoology and Director of the Museum, University of Dublin.

In the course of the dissection of some birds and mammals in the anatomy department of Trinity College, Dublin, I met with the following species of parasites, which I think are as yet undescribed. The animals from which these specimens were obtained were mostly purchased by the Rev. Dr. Haughton, from the Dublin Zoological Gardens, and I have looked in vain for the description of these species in the works of Denny, Walckenaer, Nitzsch, Burmeister, Giebel, or Rudow; so I suppose them to be as yet unnamed. The new species are as follows:

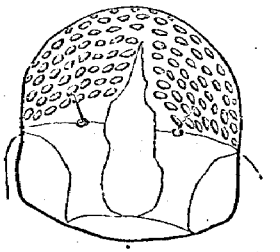
1. *Lipeurus Phœnicopteri.*

This was obtained from the body of a fine female flamingo

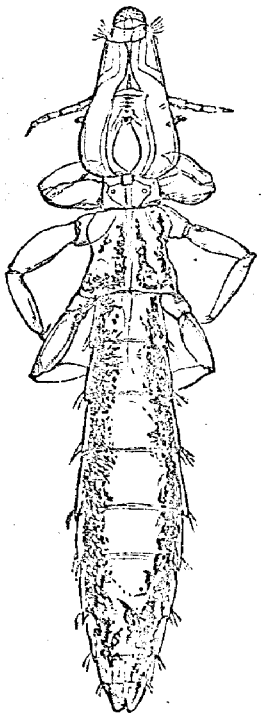


Antenna.

Claw.



Labrum.



Lipeurus Phœnicopteri.

(*Phœnicopterus ruber*, Temminck), which had been but a short time living in the gardens. I could only find a single individual of the parasite, a female, although I examined the surface carefully. By its elongate body, its absence of trabeculæ, long legs, obtusely setaceous antennæ, and posterior notch, it is plainly a Lipeurus, and belongs to the section of the genus characterised by the possession of an elongated head. Its specific characters may be summarised thus:—Glistening white; depressed head; elongated triangular labrum, covered with rows of depressed, rounded, or lenticular depressions, arranged quincuncially in seven or eight series; posterior clypeus with two lateral depressed lines, concave internally; antennæ with the second joint longest; prothorax quadrilateral; first pair of legs short, with a wart-like black dot at the posterior part of the extremity of the femur; abdomen margined with irregular pigment masses, in the form of a slightly sinuated and occasionally interrupted line, the last segment being immaculate and notched. The specimen being a female, has simple antennary joints, the fifth being very short and obtuse. The length of the entire insect is a line and a half, and its greatest breadth is about the one eighth of this.

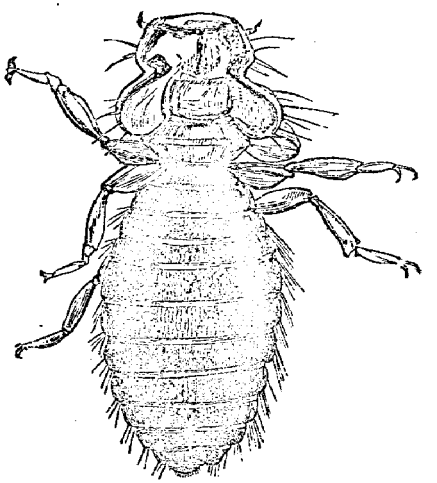
The only other flamingo parasite that I am acquainted with is the *Lipeurus subsignatus* of Nitzsch, from the *Phœnicopterus antiquorum*, Temm., referred to by Giebel, in his 'Zeitschrift für die Gesammten Naturwissenschaften,' vol. xxviii, p. 384; but this has not got the dotted labrum, nor the sinuated abdominal marginal pigment-line. It differs from the *L. squalidus* of the duck in these respects also, and in not having the regular quadrilateral markings on the side of the abdomen.

2. *Colpocephalum marginatum.*

This specimen was obtained from the feathers of the *Ardea comata* of the South of Europe, and it seems to me to come close to *C. importunum*, Nitzsch, of the *Ardea cinerea*; to *C. nyctarde*, Denny, of the *Nycticorax ardeola*; and to *C. vittatum*, Rudow, of the *Ardea ralloides* ('Zeitsch. für Gesammt. Nat.,' vol. xxvii, p. 469).

My specimens are 1-11th of an inch long, of a deep chestnut-brown colour, smooth on the surface, and much darker along the margin than in the middle. Head large, flat; anterior margin of labrum plane, posterior border of occiput concave, temporal lobes large rounded, lateral margin of clypeus deeply sinuated, orbital sinus deep and acute, antennæ small, obscure, clypeus with two dark sepia-brown

patches in front of the eye, and with three rounded umber spots at the sides and centre of the anterior border; two



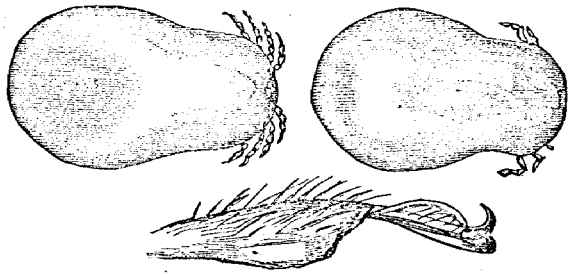
Colpocephalum marginatum.

light brown lines extend, one on each side, from the lateral notch to the base of the occiput; prothorax subrhomboidal, with a transverse line from angle to angle; mesothorax very short, metathorax not so wide as head; abdomen elliptical, longer in proportion than that in *C. Nyctarde*, and not at all claviform, as in *C. importunum*, much paler in the centre than at the side, last segment of the abdomen fringed densely with short close hairs, in a continuous series along the posterior margin, lateral border of the abdomen exhibiting indentations between the somites; femora oval, tibiæ clavate, second joint of the tarsus much longer than the first; the last joint of the hindmost leg a little longer than that of the middle, and that a little longer than the corresponding segment of the anterior pair. It differs from *C. vittatum* in its more elliptic abdomen and its darker margins.

3. *Ixodes Phascolomyis.*

This specimen was obtained from the wombat (*Phascolomys wombata*). It measures ·65 of an inch in length; its greatest breadth is ·45 of an inch. In shape it is pyriform-oval, with an elongated depression on its posterior surface, with a central rugous elevation; ventral surface with a triangular depression; limbs attached to a short oblique ridge, ·15 of

an inch long; they are ·2 of an inch in length, and terminate each in a double claw, with an expanded pulvillus, clypeus,



Ixodes Phascolymis, Tick of the Wombat (*Phascolomys Wombata*). Twice natural size.

somewhat heart-shaped, lighter in colour than the rest of the body, which is deep chestnut-brown; stigmata ventral at the apex of the triangular ventral depression, and in a small sulcus posterior; rostrum small, conical. This specimen is thus of very large size and firm and tenacious in the consistence of its integument. Several species of the genus are described from Australia, but they are all, as far as I am aware, reptilian parasites with this exception.

Dr. Royston-Pigott's Researches.[1]

The great interest which attaches to all researches directed to the improvement of the microscope, and especially to the invention by which Dr. Royston-Pigott claims to increase magnifying power, without, in the same degree, diminishing focal distance, make us desirous of laying before our readers as complete an account of them as possible. We have, therefore, gladly availed ourselves of the kind permission of the Council of the Royal Society, and of Dr. Pigott himself, to reproduce the substance of a paper communicated by him to the 'Philosophical Transactions,' and the illustrative plates, without which, in fact, much of what he has written would be unintelligible.

[1] 'On a Searcher for Aplanatic Images applied to Microscopes, and its Effects in Increasing Power and Improving Definition.' By G. W. Royston-Pigott, M.A., M.D. Cantab., M.R.C.P., F.C.P.S., F.R.A.S., formerly Fellow of St. Peter's College, Cambridge.

In this paper are described—

I. Some experiments which suggested an inquiry into a method of raising microscopic power consistent with a corresponding improvement in the precision of definition, so generally destroyed by excessive amplification.

II. The inquiries by which the construction of an aplanatic-image searcher was gradually arrived at; the object of which was to search for aplanatic foci, to compensate residuary errors by new spherical and chromatic corrections whilst amplifying power, and to increase the small interval existing between a deep objective and its object, whilst the focal perspective or depth was also increased.

The research was originally suggested by the accidental resolution of the Podura scale. This exquisite object, so justly prized by the optician for the trial of microscopes, affords peculiar markings resembling notes of admiration, of sufficient delicacy to put even the defining-power of objectives of one fiftieth of an inch to a severe ordeal. Dr. Pigott had observed these markings to disappear and be resolved into black beads. The objective employed had nearly one seventh of an inch focal length, and an aperture of 50°. The object was illuminated by solar rays reflected obliquely by a plane mirror. Having related this effect to eminent opticians, he was informed that no objectives (at that time, 1862) could resolve this test. Messrs. Powell and Lealand were, however, prevailed upon to construct a "very fine" one eighth expressly for this resolution; as this totally failed, a one sixteenth was carefully constructed with no better success, and finally a one fourth of very large aperture; all these failed to exhibit the Podura beading. Some unsuspected cause of this failure evidently remained to be investigated. The evidently delusive character of the standard test, so much relied upon for the construction of microscopic object-glasses, suggested the necessity of a search for other less uncertain methods of testing. The principle of proceeding from the known to the unknown appeared to offer the only sound basis of inquiry.

Simple objects were now examined. The finest glass threads presented linear images of any conceivable degree of proximity, whilst their fused extremities, when selected as forming refracting spherules one thousandth of an inch in diameter, presented miniature landscapes and points of light of remarkable precision, the spherical aberration of which could be easily calculated to be of insignificant amount for limited apertures. Even a plano-convex lens of one thirtieth of an inch focal length and three hundredths aperture dis-