immaturity of the new-born' seems to be in this case rather a physiological adaptation (in a broad sense) to a milk diet. In any event, β-galactosidase belongs to the few biochemical systems showing an activity in this period, generally marked by enzyme deficiencies[5], higher than in adult age.

Conchie *et al.*[4] have shown a considerable increase for this and other mammalian glycosidases in the epididymis, apparently associated with sexual development. The enzyme activity from other tissues remains about the same during and after growth, and this finding has been confirmed by us for the pancreas and liver in all the conditions mentioned here.

It should be noted that the fall in β-galactosidase activity is observed at the time of weaning, where other authors have found a loss of permeability to macromolecules, such as insulin and anticorps[6]. This age seems to be peculiar in the evolution of the gastro-intestinal tract of the rat.

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ANIBAL ALVAREZ
JOSÉ SAS

Departamento de Bioquímica y
Departamento de Neurobiología,
Instituto de Investigación de
Ciencias Biológicas,
Avda. Italia 3318
Montevideo, Uruguay.

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## Avian Schistosomes in Hertfordshire

*Limnaea stagnalis* collected from three sources in the vicinity of Winches Farm Field Station of the London School of Hygiene and Tropical Medicine were found to be shedding furcocercous cercariæ. On emergence from the snail, the cercariæ swam freely for a short time with either the head- or tail-end forward and then attached themselves to the side of a beaker nearest the light. The cercariæ were apharyngeal, possessed a pair of eyespots and had six pairs of flame cells in the body and one pair at the base of the tail. The posterior part of the body was taken up by five pairs of penetration glands, the two anterior pairs having coarsely granular and the three posterior pairs having finely granular contents. In its behaviour and morphological characters the cercaria is identical with that described as *C. ocellata* by Rees[1] and Taylor and Bayliss[2], who have given a detailed description of the cercaria which will not be repeated here. At one site (Verulamium Lake) a small percentage of *Limnaea ovata* were occasionally found to be shedding this cercaria. In both hosts the sporocysts were located in the digestive gland.

Several attempts were made to infect domestic ducks, by single and multiple infections, by cutaneous and oral routes with pooled cercariæ from a large number of infected snails. Droppings were examined for eggs at weekly intervals, and at 4–6 months post-mortem examinations for worms were made. All results were negative. It has been observed that the birds common to all three locations are duck, moorhen and coot.

D. L. H. ROBINSON

Bilharzia Research Unit,
Medical Research Council,
Winches Farm,
St. Albans, Herts.

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## Diapause, Neurosecretion and Hormones in Copepoda

DESPITE the great advances made during the past decade in the investigation of the endocrinology of the Crustacea Malacostraca[1], little or nothing has been published on the endocrine organs or hormones of the lower Crustacea. Neurosecretory cells have been observed in barnacles[2], but nothing is known for certain of any hormonal emanations from these cells.

*Calanus finmarchicus* and *C. helgolandicus* pass through three generations a year, in southern populations at least, overwintering as the last larval instar (the fifth copepodid stage)[3]. It has recently been shown (Smyly, W. J. P., personal communication) that *Cyclops leuckarti* has a similar life-history, and that, in this species, the overwintering copepodid penetrates to a depth of some 15 cm. into the mud of lake bottoms, passing the cold season in a quiescent state. This condition has obvious analogies with the diapause of many species of insects, which is known to be controlled by the endocrine system, especially by the neurosecretory system of the brain. We have therefore embarked on an investigation of the equivalent system of copepods.

The endocrine structures of the cerebral region of *Calanus* include a pair of lateral groups of neurosecretory cells at the front edge of the brain. From these the neurosecretory fibres pass forward and outward, skirting round the anterior blood sinus to reach the frontal organ. In adult and juvenile copepodids taken during the summer months these neurosecretory cells contain an abundant granular secretion. In the overwintering larvæ, however, this secretion is grossly depleted or even absent. By analogy with insects, therefore, we conclude that the secretion of these cells is probably playing some part in the control of the diapause, moulting and the overwintering metabolism and behaviour.

In the Crustacea Decapoda the same endocrine structures which are concerned with the control of moulting and metabolism also govern colour change. It therefore seemed reasonable to look for chromactivating hormones in copepods, even though they may possess no chromatophores. Accordingly, extracts of whole *Calanus finmarchicus* and of whole *Euchaeta norvegica* were assayed for chromactivating substance *A* (ref. 4) on *Leander adspersus*. One unit of this substance was found in 7·2 whole *Calanus*, while 6·5 units were found in one whole *Euchaeta*. The whole of the activity was found to be present in the cerebral region of the body in *Euchaeta*, and in the brain plus frontal organ of *Calanus*. It seems likely, therefore, that this hormone is secreted, as in decapods, by the neurosecretory cells of the brain.

This work is continuing, and a fuller account will be published elsewhere. We are grateful to Dr. F. S. Russell, Dr. S. M. Marshall, Mr. W. J. P. Smyly, Dr. B. Swedmark, the National Science Foundation and