synthesizing particles appears to be the plasma membrane.

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C. L. VILLEMEZ*
J. M. MCNAB†
P. ALBERSHEIM

Department of Chemistry,
University of Colorado,
Boulder, Colorado.

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* Present address: Department of Chemistry, Ohio University, Athens, Ohio 45701, USA.
† Present address: Department of Chemistry, University of Edinburgh, Scotland.

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Steroid 3β-ol-Dehydrogenase Activity in the Cyclostome Gonad

HISTOCHEMICAL techniques for the localization of the enzyme steroid 3β-ol-dehydrogenase have been widely used to demonstrate the sites of cellular steroidogenesis. In mammals this enzyme has been demonstrated in the adrenal cortex, gonadal interstitium and placenta, and in non-mammalian species positive reactions have been observed in the somatic gonadal tissues of birds[1,2], reptiles[3], elasmobranchs[4] and teleosts[5-7]. So far no studies of this kind seem to have been made on the gonads of the primitive agnathans.

In the testis of the river lamprey, *L. fluviatilis*, endocrine activity has been attributed to the interlobular tissue, which undergoes a cycle of development during sexual maturation[8], comparable with that of the vertebrate Leydig cells. During the earlier phases of spermatogenesis in the autumn, the interstitial tissue consists of isolated interlobular connective tissue elements, and throughout the winter these appear to increase in number, while their cytoplasm develops small osmophilic and sudanophilic granules. In the later stages of spermioteleosis in early spring, the testis interstitium accumulates large areas of lipid and cholesterol positive droplets.

Tests for the presence of the enzyme have been carried out on the lamprey testis throughout the period from October to April, and on the ovaries of sexually mature females. After freezing the tissue on solid CO_2, sections cut on the cryostat were subjected to the procedures described by Galil and Deane[9] and incubated in a medium containing dehydroepiandrosterone, together with DPN and nitro-BT. A positive reaction was indicated by the appearance of discrete formazan granules within the lipid droplets in both ovary and testis, but in the former a distinct blue or purple staining was also observed. Removal of free lipid after incubation, by treating the sections with mixtures of ether and alcohol, left the formazan deposits intact at the sites of deposition. In the testis, formazan deposition was usually confined to the interlobular areas where the interstitial cells occur, and in the ovary the most intense reactions were observed in the granulosa cells. During the period from October to December, when, for the most part, the male germ cells are in the spermatogonial or primary spermatocyte stages, only weak reactions were obtained. In February and early March, more marked reactions were observed, although enzyme activity at this time showed considerable variability from one animal to another. Later, in March and early April, when spermatozoa are present, positive reactions were more general, although tending to be less intense.

These observations apparently provide the first direct evidence of steroid biosynthesis in the interlobular tissue of the lamprey gonad and tend to confirm the homology of this tissue with the vertebrate Leydig cells.

M. W. HARDISTY
K. BARNES

School of Biological Sciences,
Bath University of Technology.

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Intraspecific Relations of Insects living in Groups

THE modern idea of a species as a whole system is characterized by particular relations between members of the species. Thus the reactions of individual members of a population to external forces are different from the reactions of the whole population. The dependence of the behaviour and way of life of invertebrates on the interactions between members of a population has not often been investigated. It has been considered more often with reference to the theory of intraspecific competition and the principle of Malthus.

It is very interesting to examine intraspecific relations which are clearly seen, for example, between insects which live in groups but which have not yet reached a high level of specialization or morphological differentiation such as the social insects have reached. Until recently neither the advantages of the group life of some butterfly larvae nor the reasons for such a way of life had been much studied, and authors who had taken up the question had not provided any explanation[1-5].

We have studied the larvae of *Nygmia phaeorrhoea* and *Galleria mellonella*, which live in groups. The former hibernate in common nests, and at other times of the year remain near the nest during the day and return to it in the evenings. Larvae of *Galleria mellonella* also live in groups, consisting of some scores of caterpillars living in empty pieces of honeycomb. *Ocneria dispar* larvae, which remain independent from birth, were used for comparison.

We found that the most important factor which determines the group way of life is temperature. In the spring of 1952 we measured the atmospheric temperature of winter nests containing caterpillars (live nests), and of empty winter nests (dead nests) of *Nygmia phaeorrhoea*. We also measured the temperature of the group of cater-