

dryl reagents, showed that SH groups of the apical membrane of toad bladder are involved in the regulation of both basal and stimulated Na transport, but no data on water transport were reported by these authors. Conversely, Bentley³ found that both GSH and GSSG blocked the hydros-motic effect of oxytocin in frog bladder, but the natri-fic effect of the hormone was not investigated in the presence of glutathione.

A survey of the literature concerning the action of diamide in other cell systems, shows that a perturbation of the thiol-disulfide status has been the mechanism usually invoked to explain the multiple effects induced by this agent^{4-7,13-16}. Although specificity of diamide as an intracellular oxidant of glutathione has been challenged^{17,18}, it is widely accepted that the shift of the GSH/GSSG ratio towards oxidized glutathione is a prominent feature of diamide action. Moreover, several recent reports suggest that the pertur-bation of GSH homeostasis by diamide can affect microfilaments¹⁹, intracellular Ca⁺⁺ levels^{20,21} and the as-sembly of microtubules^{14,15,22}. A newly described effect,

however, deserves particular attention here: the specific inhibition by diamide of protein kinases^{23,24} which are cAMP-dependent²⁵. Such an action may provide the most important clue for the understanding of the block of oxytocin, isoproterenol and theophylline reported in this work. It would imply, however, that diamide blocks the hormonal stimulus-effect coupling at a step beyond the generation of cAMP. To test this hypothesis, we examined the effect of 'external' diamide (1 mM) on exogenous cAMP and found a moderate (26%), although significant, inhibition of its natri-fic action (table 1).

Diamide appears to be a unique chemical probe to study the role of intracellular and/or membrane SH-groups on a variety of transport processes. The mechanism(s) under-lying the multiplicity and the sidedness of its effects in asymmetric cells are still unknown. Inhibition of kinase activity²³⁻²⁵ and/or cross-linking of membrane proteins²⁶ are appealing lines of research deserving further investiga-tion.

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Occurrence of an endocrine centre in the gonad of a land slug *Laevicaulis alte* (Gastropoda: Pulmonata)

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Summary. An endocrine centre consisting of club-shaped cells has been found in the gonad of a slug for the first time. It is situated in the right half of the gonad near the periphery.

Garnault² and Chalaux³ noted that in snails castrated by infection, the reproductive tract becomes attenuated. Laviolette⁴ confirmed this and considerably extended these results by experimental studies using various limacid and arionid slugs. The conclusion from these experiments is that the maturation of the albumen gland and the common duct is controlled by a hormone from the gonad. In *Ariolimax columbianus*, the production of tentacle sperma-togenic hormone appears to be controlled by a hormone releases from the gonad⁵. But no cytological evidence for any endocrine cells has so far been found in the gonad of these gastropods. Therefore it is of interest that we have

located the position of the endocrine centre in the gonad of a land slug *Laevicaulis alte*.

The slugs *L. alte* are available in great abundance in Nanjundapuram area in the vicinity of the Coimbatore city during the monsoon season. 'Susa' fixative was injected into the freshly collected large slugs to kill them and then the reproductive system was dissected out. The gonad was isolated and left in fresh fixative for 6-12 h, according to Runham and Laryea⁶, and serial sections at 5-8 µm pre-pared by paraffin method. The sections were stained in Gomori's chrome-haematoxylin-phloxin and paraldehyde fuchsin according to modifications of Halmi and Dawson⁷.

The gonad (hermaphrodite gland) in the present species has a single conical lobe as in *Vaginulus borellianus*⁸. Examination of serial sections of the gonad revealed the presence of a short tract of cells staining intensely with the 2 stains, which are most specific for the endocrine cells. The position of these cells in the gonad has been shown diagrammatically in figure 1. It may be noted that the endocrine centre is a narrow streak located in the right half of the gonad near the periphery. The cells in the centre are mostly club-shaped having an oval body and a narrow stalk (figure 2). The nuclei are fairly large and centrally placed in the broader part of the cells. They fail to take the stain and appear as white discs. The cytoplasm stains very intensely. The narrow stalks of many of these cells prolong further and give rise to fine branches which are often confluent among themselves (figure 2).

To confirm that the cells in question contain material of the nature of hormone, appropriate histochemical tests specific for hormones are performed on the sections. The Kober's test⁹ was positive on these cells. This is corroborated by the

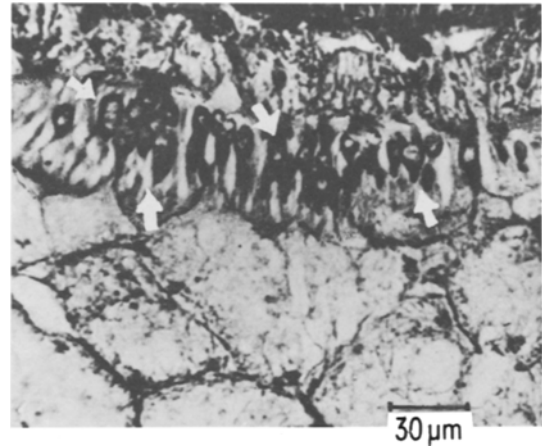


Fig. 2. Long section through the neurosecretory centre in the gonad of *Laevicaulis alte* stained in chrome-haematoxylin-phloxin. The arrows point to the groups of endocrine cells.

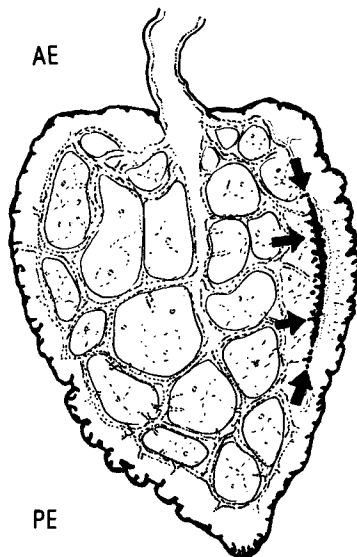


Fig. 1. Semi-diagrammatic figure of the frontal section through the gonad of *Laevicaulis alte*. The arrows denote the position of the endocrine centre. AE, anterior end; PE, posterior end.

positive reaction yielded by these cells to Hooker-Forbest and thiocol-copper sulphate tests for hormones^{10,11}. In the light of these observations, it may be inferred that the cells comprising the streak found on the right side of the gonad in *L. alte* are endocrine in function.

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Cocci and diphtheroids in blood cultures from patients in various pathological situations

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Summary. The evolution of cocci and diphtheroids taking origin from cell-wall-deficient forms seems not to be related to a particular state of illness, but to be the consequence of a generalized crypto-infection.

Previous research by other authors and ourselves¹⁻⁴ have demonstrated the presence, within the circulating blood of clinically normal subjects, of bacterial minimal reproductive units (MRU) and cell-wall-deficient (CWD) forms associated with the erythrocytes and platelets, which evolve in the haemocultures towards conventional forms of Corynebacteria-like microorganisms (diphtheroids) and *Staph. epidermidis*. It has been claimed^{5,6} that the incidence of

Corynebacteria-like microorganisms, recognizable as *Bacillus licheniformis* var. *endoparasiticus*, is higher in arthritic than in healthy subjects, and that such microorganisms may also be associated with malignancy¹. The authors already cited, and others who have carried out analogous research⁷, have observed that in the majority of cases the evolution of CWD and the reversion to conventional bacterial forms take place following very prolonged periods of incubation: