

life cycle, and it renovates its case at least once between two consecutive instars. The study of case construction^{6,7} and its renovation in bagworms appears to be interesting.

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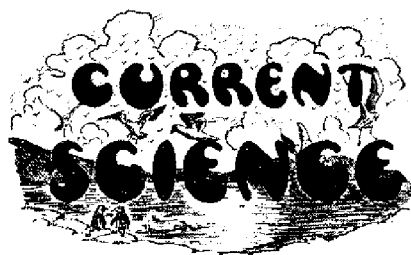
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ARVIND AGRAWAL
ATANU KUMAR PATI*

*School of Life Sciences,
Pt. Ravishankar Shukla University,
Raipur 492 010, India*

**For correspondence.
e-mail: akpati19@hotmail.com*



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The manufacture of glandular products: The organization of our slaughter houses

The chemist in this country who attempts work on glandular products, either for large-scale production in a factory, or for preparation on a small scale in the laboratory, is brought, sooner or later, inevitably to the realization that his raw materials, namely, the various animal glands, though potentially vast in quantity, are not available to him in the manner and form in which he would have desired to obtain them. While several hundreds of animals are killed daily in the slaughter houses of the cities in India, there is at present no provision made for facilities for the preservation of these glands in order that they might be worked up later, or be transported to a distant place where the central factory for the manufacture of the glandular hormones might be situated. The organizations which have been perfected in the

abattoirs of Europe and the Packing Houses of America are, it is sad to state, conspicuous by their absence in India. Few of us are, perhaps, aware that the collection and export of these tiny glands form the basis of a flourishing trade in South America, and still fewer realize that, even apart from such American firms as Park Davis Co., and others, some of the biggest pharmaceutical concerns in Great Britain are dependent to-day mainly on the countries across the Atlantic for their supply of raw materials for the manufacture of products like insulin, pituitrin, etc. The classical researches of Harington on the structure of Thyroxine might, perhaps, never have been accomplished but for the large amounts of raw materials in the shape of Thyroid glands supplied by the South American cattle yards. One of the chief secrets of this splendid organization in Europe and America lies in the high efficiency which has been attained in the technique of large-scale refrigeration. Insulated chambers, cooled by refrigerating machinery, are the essential features of all modern abattoirs. Immediately after the animals have been killed, the dressed carcasses are removed to the cold rooms. They are kept there for several hours during which all the endocrine glands are removed neatly under expert supervision. They are then frozen and conveyed immediately in iced and insulated trucks to local firms, if there are any, or packed into large refrigerated chambers in ships which take

them all the way across the Atlantic. In our country, on the other hand there are, I believe, no slaughter houses which can boast of insulated cold rooms. The result is that there is little time available for the selection and removal of the glands which, in several cases, have their potent principles destroyed to a large extent even by an hour's delay of removal, due to the setting in of autolysis.

A word in this connection about the methods of killing animals in our abattoirs may not be out of place. Cattle and sheep are, as a rule, not stunned as is the humane practice adopted in the abattoirs of Europe and America; on the contrary, the animals are almost always subjected to the horrible sights and smells of the slaughter house, and they often witness the sufferings of their fellows. One of the most important glandular products, Adrenaline, is known to be the hormone of emergency, and it is not at all improbable that in the struggle of the animals during the few minutes immediately preceding death, a considerable portion of the stock of this hormone in their glands finds its way into the blood stream, and is thereby lost. In introducing reforms in these wasteful practices, it is necessary not only to rouse the public conscience but also to have the intelligent co-operation of some of the meat-eating communities in India in bringing about the necessary relaxation of their religious scruples.

B. B. Dey