their abundance in the seas around Krusadai. Crude oil is extracted by fishermen from the flesh of this turtle and is used by them for smearing country-crafts. The determination of the nesting season and a study of its nesting habits have, therefore, a bearing on the protection of this turtle-fishery, should such a need arise in the future.

Krusadai Biological Station,
Pamban P.O., P. I. CHACKO.
December 9, 1942.

ON THE MANUFACTURE OF GLANDULAR PRODUCTS IN INDIA

THE recent note[1] by Prof. Dey on the preparation of adrenalin from suprarenal glands is of interest to those who are associated with the manufacture of adrenalin hydrochloride solution in India. In a previous note[2] it was recorded that the total amount of adrenalin that might be produced from natural resources would barely exceed 100 ounces; whereas Dr. Dey now on the authority of the Board of Scientific and Industrial Research mentions that the mobilisation of the raw materials from the slaughter houses of only ten of our large cities might lead to the production of sufficient adrenalin to meet the demands of civilian population and the military requirements. But Prof. Dey has not pointed out his method of extraction, nor the exact yield of adrenalin per 100 glands as collected from the local slaughter houses. In handling thousands of glands we are finding that the average weight of a suprarenal gland comes to about 4·8 to 5·0 gm., and the yield of pure adrenalin per 100 of such glands varies from 0·1 to 0·12 gm. This figure is about 25 per cent. lower than what is being recorded in some standard books[4] where the yield is shown to be 0·13 to 0·16 gm. per 100 glands. Of course it is not known to us whether this low yield is due to any defect in our technique of extraction, collection of glands or to some inherent drawback in the nature of glands themselves.

It must, however, be noted as already recorded by Dey[3] that adrenalin being a hormone of emergency may be excreted out into the circulatory system of the animals when they are brought to the abattoirs as existing in the present state. In connection with our work on the posterior pituitary lobes we also find that although the powder that is finally obtained by drying the fresh lobes collected from the local slaughter house possesses the same potency as what is being noted in a similar powder secured from reputed firms in the Western countries, the yield in dry powder is again about 40 per cent. less than that recorded by workers abroad. Thus, in isolating the physiological principles whether from suprarenals, gall bladders, pituitary lobes, or any other gland, the purity of the product is beyond question, but the yield on the amount of the active principle is invariably poor. The problem is how to increase this yield. The method of slaughtering is to be altered and the abattoirs are to be improved. The solution, however, seems mainly to remain in melioration of the breed and class of animals that are being daily brought down to the slaughter houses for supplying the meat requirements of the cities.

Bengal Immunity Research
Laboratory, Calcutta, U. P. BASU.
January 15, 1943.

1. This Journal, 1942, **11**, 414. 2. *Ibid.*, p. 290. 3. *Ibid.*, p. 420. 4. *Cf.*, Fourneau, *Organic Medicaments and Their Preparations* (J. & A. Churchill), 1925, p. 230.

I HAVE read with much interest the note sent by Dr. Basu on the manufacture of glandular products in India. Full details of experiments regarding methods of extraction, and exact figures relating to yields of products at different stages, could not be disclosed in the publications which have appeared from time to time from this laboratory, as the investigations were being carried out under the auspices of the Board of Scientific and Industrial Research who possessed all the rights over the results. The publications were intended principally to focus attention on what seemed to be a topic of great public interest, and I am glad to note that this purpose is being achieved to a great extent.

Without any fear of infringing on the rights of the Board, it may be stated definitely that the yields of adrenaline obtained in this laboratory, have been considerably higher than those reported by the writer. An important reference appears also to have been misquoted: The yield obtained by Fourneau is 0·13 to 0·16 gm. per 100 grams of gland material and not per 100 glands. The weights too of the glands mentioned 4·8 to 5 gm. make it obvious that only glands of cattle are referred to; the glands of sheep have been left out of the calculation. Several thousands of these animals, however, are being slaughtered daily in our cities, and although the sheep glands are much smaller than those of cattle, they must, by sheer weight of numbers, inevitably constitute the major bulk of the raw material for these products.

The statement that the yield of active principles from the glands of Indian animals is invariably poor is also not always borne out by experience. In the brief review of the technical work of the Board of Scientific and Industrial Research, published in your *Journal* (1942, p. 171), it was pointed out that desiccated Thyroid, as prepared in Madras, is considerably richer in Thyroxin-Iodine than the specimens imported from abroad. In the case also of the Pituitary, although the net weight of the whole gland is smaller, there is a special feature of the Indian animal gland which has been found to make up to some extent for its deficiency in weight.

I may take this opportunity to point out that further statistics, which have now been made available by the Board, confirm our original belief that, as in the case of adrenaline so also in the case of posterior pituitary extracts, India could supply all her requirements.

Presidency College,
Madras, B. B. DEY.
February 4, 1943.