

Letters to the Editor.

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The Essential Hormone of the Parathyroid Gland.

THE essential hormone of the parathyroid gland has been obtained in certain extracts of the fresh glands of the ox (*J. Biol. Chem.*, 1925, 63, 395). Potent extracts have been prepared by first submitting the glands to acid hydrolysis under carefully controlled conditions. The active principle has thus been fractionated along with co-existent substances from the hydrosylate and thus obtained in a relatively high degree of purity.

That a principle contained in these extracts represents the essential normal internal secretion of the parathyroid gland has been shown by the fact that thyroparathyroidectomised dogs on a lean meat diet, treated with these extracts, have been kept free from tetany so long as adequate dosage at proper time intervals has been maintained. The withdrawal of this treatment has resulted in the onset of tetany in these animals. Also, it has been shown that thyroparathyroidectomised dogs which have developed tetany could be restored to normal by the use of potent parathyroid extracts. There is at this time in our laboratory a thyroparathyroidectomised dog which was operated upon some four months ago. This animal is in perfect health. It has been treated continuously with parathyroid extract. Withdrawal of the extract for one day, even after four months of such therapy, has resulted in the precipitation of violent tetany, which has been relieved by the reinstitution of the treatment.

Along with many others, it has been our conviction that parathyroid tetany is primarily due to a lowered calcium content of the blood serum. It was a matter of great interest, therefore, to show that the administration of potent parathyroid extracts results in a mobilisation of calcium salts in the blood-stream. It has been found that potent parathyroid extracts cause a mobilisation of calcium not only in thyroparathyroidectomised dogs, but also in normal dogs. Just as there is a typical blood-sugar curve following the administration of insulin, so also there is a typical blood-serum calcium curve following the injection of active parathyroid extract into dogs. The degree of hypercalcaemia induced in a dog by the injection of a parathyroid extract was also found to be directly related to the size of the dose administered. The potency of parathyroid extracts can therefore be determined with a fair degree of accuracy by the use of several normal animals which are under dietary regulation.

Repeated injection into normal meat-fed dogs of an active extract at intervals of a few hours, has resulted in a condition of profound hypercalcaemia. This condition, if maintained, has ended in a fatal issue. In such cases a typical train of symptoms has been manifested. Many changes in the physical and chemical characteristics of the blood induced by parathyroid hormone overdosage have been observed. Probably the most important of these changes in relation to the fatal issue is a decrease in blood volume and the consequent thickening of the blood itself. Preliminary experiments directed towards the antidoting of the symptoms of parathyroid hormone overdosage seem to point to this as the main factor to avoid or, if present, to counteract. Repeated intra-

venous injections of hypertonic glucose or saline solutions have proved of definite value. When such treatment has been instituted early in the case of dogs receiving repeated injections of potent extract, the animals lived longer than the controls. No absolute antidote has as yet been found.

It is also of interest to note that typical guanidine tetany has been induced in normal dogs at a time when they were also manifesting a condition of profound hypercalcaemia as a result of repeated simultaneous administrations of guanidine hydrochloride and potent parathyroid extract.

Experiments have shown as well that there is some intimate relationship between the habits of life of an animal and the function of the parathyroid glands. The rabbit, for example, has been found to be peculiarly resistant to repeated injections of the hormone, whereas the dog has been shown to be highly sensitive to it.

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The Preservation of Fishing-nets, Mosquito-nets, and Tent Fabrics.

It has been shown by H. F. Taylor and A. W. Wells (Bureau of Fisheries, Document No. 947, Washington, 1923) that copper oleate dissolved in petrol or benzol is an efficient preservative for nets immersed in salt water. To avoid the creeping out of the soap to the surface on drying, the ten per cent. oleate solution receives one per cent. of mineral oil or of creosote. In fresh water, less satisfactory results were obtained unless a considerable amount of tar was added as a binder.

I have carried out a few tests, using this method, and the results have all been favourable. Silk plankton tow-nets become weakened in about three months' use, varying with the amount of wear. Previous work showed that this is in part due to the action of sunlight, but the major part appears to be due to bacterial action. Silk netting treated with copper oleate was kept in sea-water for six months, the water being changed every other day, and though in time the soap vanished the netting remained sound. Controls were much weakened inside five weeks, and shortly after that could be torn like wet paper. Since silk nets are costly, about 11*l.* for a set of four, and the preservative costs less than a shilling per net, the advantage of using it is obvious.

When tried on stout "stramin" (hemp) netting good results were also obtained, but less striking, for this material is vastly more resistant than silk. In addition to copper oleate a mixed copper soap specially prepared by Mr. W. A. Davis, of Messrs. Lever Bros., was also tried. This, being less soluble than oleate, was used in five per cent. solution. It has proved as efficient, or rather more efficient, than the pure oleate, though used in half the concentration.

After six months in sea-water the lighter stramin netting was found to be rotten, but the piece treated with mixed soaps remained sound, and single threads could only be broken with difficulty. The stouter stramin stank after six months in sea-water; though it could not be torn its appearance and feel had altered and single threads could be broken. The portions treated with oleate and the mixed soaps remained perfectly sound; single threads could not be broken by hand. A sufficient amount of copper soap remained on these pieces to render them much darker in colour than the untreated; of the two the mixed soaps appeared to remain on better than the oleate.

Linen and cotton tentings treated with oleate or