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The hormone of the parathyroid gland.

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[*From Faribault, Minn.*]

The first stage in the extraction of parathyroid active principle is accomplished by extracting in hot acid, preferably *dilute* hydrochloric acid.[1]

PREPARATION OF THE HYDROCHLORIC X.

Fresh bovine parathyroid glands (freed from fat as much as possible, without removing parts of the gland) finely divided	30 gm.
Pure distilled water	495 cc.
Concentrated hydrochloric acid (C. P.)	5 cc.

This is boiled for two hours, the solution allowed to cool and made up to 500 cc. with pure distilled water. Most of the insoluble fats are removed by the ordinary process of skimming. Some of the fat adheres to the container in the solidified state. Pyrex glassware is used throughout the entire process, using glass ladles for skimming. The solution is filtered through gauze and fine mesh filter-paper. 5 cc. of the Hydrochloric X are equivalent to 0.3 gm. of the fresh gland. If the fresh glands are finely ground in a Latapie grinder, boiling for fifteen minutes is sufficient to bring out the full amount of the active principle obtainable. Boiling for two hours, however, does not lessen its activity.

The Hydrochloric X may be modified as the first step in its purification, by adding sodium hydroxide, preferably in a concentrated solution to avoid *too* great an increase in its bulk, to the point of maximum precipitation, filtering and concentrating by evaporating in a vacuum.

The injection of amounts of this preparation equivalent to 0.3 gm. of the fresh gland, causes a marked rise in the calcium content of the blood serum of thyroparathyroidectomized dogs, ranging in weight from 9 kg. to 14 kg. In the dogs reported, a rise in the blood serum calcium above the content normal for each dog,

[1] Hanson, *The Military Surgeon*, April, 1923; January, 1924.

or the content found previous to operation, the percentage increase ranged from 27.6 to 80.8; while the percentage increase above the lower level, following thyroparathyroidectomy, ranged from 82.5 to 136.

From the work of Dr. A. M. Hjort, whose article is now in press, it is shown that the Hydrochloric X is very stable, retaining its potency for 15 months, when kept in an ice-box. There is some evidence that points to a lesser degree of stability in neutral or slightly alkaline solution. The author calls attention to the variability of the response of different dogs to the same dose, as well as in the same dog at different times. This renders an absolute standardization difficult by the method of calcium determination. There are too many variables to justify an explanation of these differences in response. Operated dogs are more responsive than normal dogs. Operated dogs, before the onset of tetanic symptoms, respond more readily than do dogs in active tetany. In active tetany, larger doses are necessary to restore the dog to normal. Dr. Hjort also finds that the active element is not in the lipoids of the gland, for, parathyroid tissue, thoroughly dessicated and defatted with acetone and chloroform, yields a very active extract upon boiling with dilute hydrochloric acid. Neutral and alkaline aqueous and alcoholic extracts have so far proven inactive. Acid aqueous and alcoholic extracts contain the active element. He has succeeded in raising the calcium content of normal dogs 100 per cent with a preparation similar to the Hydrochloric X.

Dr. J. C. Collip has recently prepared an extract similar to the Hydrochloric X in that it is hydrochloric acid extract. He reports that it is effective in raising the calcium content of the blood.

An acid extract of the bovine parathyroid, as the Hydrochloric X, or its modification, contains that parathyroid element that produces a pronounced increase in the calcium content of the blood. This is conclusive, as this pronounced rise in the blood serum calcium was secured in thyroparathyroidectomized dogs on a meat diet.