GOITRE COMMITTEE.

STUDIES ON THE THYROID: I.

CHAPTER I.—INTRODUCTION.

A Goitre Committee has been set up under the auspices of the Medical Research Council with its headquarters in the Otago Medical School in Dunedin. Researches on thyroid problems which have been in progress in the Medical School for many years are in large measure being carried on by this Committee, and this report by C. E. Hercus, N. Edson, T. H. Kennedy, and H. D. Purves constitutes the first official publication from the Council on thyroid problems. Further investigations on the role which iodine-lack plays in the production of goitre are presented, particularly as regards the level of iodine metabolism as measured by the urinary excretion correlated with the incidence in goitre in various districts in New Zealand and in certain other countries which have been accessible to us. One of the objectives of the investigation has been to detect and define the part which factors other than iodine-lack are playing in the production of goitre. It has also been the aim to determine with more precision the manner in which iodine-lack produces thyroid derangement. The study also presents the results of certain experiments in goitre prophylaxis. In addition to the financial assistance provided by the Medical Research Council, work is embodied in this study which was carried out before the advent of the Council, and was made possible by financial aid from the Sir John Roberts' fund for Medical Research.

CHAPTER II.

Thyroid Physiology and Experimental Goitre.

(*a*) Hercus and Purves (1936) reported results of investigation of goitrogenic activity in *Brassicae* species in New Zealand. They showed that the seeds of various *Brassicae* when fed to rats caused hyperplasia, hypertrophy, and loss of colloid and iodine from the thyroids.

Further tests have been made with these materials. The diets employed were made up as follows: Ground seed, 45; skim milk, 30; maize-meal, 20; marmite, 3; cod-liver oil, 1; sodium chloride, 1: total, 100.

The iodine content of such diets averaged 270 micrograms per kilo, equivalent to approximately 67 micrograms per 1,000 calories. Such a diet is a comparatively iodine-rich one. The duration of each experiment was thirty-days.

Table I.

Diet.	Weight of Thyroid.	Activity.
	Mg.	
(*a*) Control	11	..
Radish-seed	14	Slight.
Old cabbage-seed	15	,,
Fresh cabbage-seed	41	Marked.
Turnip-seed	47	,,
(*b*) Steamed white mustard	25	Moderate.
Steamed mustard, ether and alcohol extracted	14	Slight.
(*c*) Turnip-seed	31	Marked.
Turnip-seed and iodide	14	Slight.

Diet.	Weight of Thyroid.		Activity of Steamed Diet.
	Diet unsteamed.	Diet steamed.	
	Mg.	Mg.	
(*d*) Rape-seed	24	12	Inactive.
Cabbage-seed	41	15	Activity greatly reduced.
Turnip-seed	47	21	

Table I shows the results obtained.

Of the two seeds not previously tested, one, radish, proved almost inactive, while the other, turnip, showed the highest activity yet found in this group, producing an enlargement of the thyroid to four times the normal size in thirty days. The experience with cabbage-seed shows that there is a loss of activity on storage. This loss was almost complete after two years' storage.

The steaming experiments are interesting since Webster (1932) recorded that steaming enhanced the activity of cabbage-leaves. Our results show for the seeds a considerable loss of activity from ten minutes' steaming, though turnip still retained a moderate activity after steaming.

It is proposed to continue these investigations by testing the effect of water, ether, and alcohol extracts of active seeds. If active extracts are obtained it is proposed to attempt the isolation of the active substance.