than Graves' disease, as for example, pernicious anemia and simple goiter.

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Effect of Ergotamine Tartrate on the Heat Production of Normal and Thyroidectomized Rabbits.

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There are available in atropine and pilocarpine a good paralyzing and a good stimulating drug for the parasympathetic nervous system. For the sympathetic nervous system we have in adrenalin a powerful stimulant, but as yet no proven drug which paralyzes the sympathetic or neutralizes the action of adrenalin.

Recently through the work of Stoll[1] a very promising drug, ergotamine (ergotoxin of Dale[2]), has become available in sufficient amounts and purity to work with. This drug has been shown to have many activities opposite to those of adrenalin. For example, it lowers blood sugar,[3] body temperature and heat production, especially in case of exophthalmic goiter.

The only observations on the effect of ergotamine on heat production in animals which we have been able to find are those of Bouckaert,[4] who noted a rapid fall in heat production following the injection of ½ mg. of ergotamine tartrate in a thyroidized dog from +26.4 to —19 per cent. This same observer was unable to obtain a reduction in a normal dog. It seemed so unlikely that a drug which lowers metabolism in thyroidized animals should not also lower metabolism of normal animals that we were led to repeat this experiment, using rabbits and doses of 1/8, 1/4 and 1/2 mg. of ergotamine tartrate* given subcutaneously. In the control rabbits 1 cc. of 0.9 salt solution was injected subcutaneously. The results are given in the following table:

* The ergotamine tartrate (Gynergen) was supplied by the H. A. Metz Co., Brooklyn, N. Y.

TABLE

Rabbit No. Sex Date of birth		Ergotamine Tartrate						1 cc. 0.9 per cent Salt Solution					
		612 M Born 11/20/25			617 F Born 3/31/25			589 F Born 3/12/25			607 M Born 11/20/25		
Date and amt. ergotamine inj.	Periods of 2 hrs. each	Wgt.	Total cal.	Cal. per kg. per hr.	Wgt.	Total cal.	Cal. per kg. per hr.	Wgt.	Total cal.	Cal. per kg. per hr.	Wgt.	Total cal.	Cal. per kg. per hr.
		gms.			gm.			gm.			gm.		
Obser. No. 1 12/7/26	Before inj.	2602	14.38	2.77	2728	11.90	2.18	2582	10.57	2.05	2465	12.46	2.53
1/8 mg.	After inj.												
	1st		13.87	2.67		11.61	2.14		12.10	2.35		12.62	2.56
	2nd		12.18	2.35		11.72	2.16		11.70	2.27		14.64	2.98
Obser. No. 2 12/10/26	Before inj.	2496	12.52	2.51	2621	11.78	2.25	2463	**	**	2420	11.06	2.28
1/4 mg.	After inj.												
	1st		11.79	2.38		9.88	1.88		12.10	2.46		12.17	2.52
	2nd		10.68	2.16		10.24	1.96		11.84	2.41		12.40	2.57
	3rd		10.88	2.20		8.90	1.70		10.59	2.16		11.62	2.41
	4th		11.22	2.27		11.23	2.15		10.70	2.18		11.18	2.32
Obser. No. 3 12/15/26	Before inj.	2531	13.01	2.57	2605	10.89	2.09	2510	13.21	2.63	2372	12.00	2.53
1/4 mg.	After inj.												
	1st		11.12	2.20		8.83	1.70		12.46	2.50		12.19	2.57
	2nd		11.46	2.27		9.12	1.75		12.87	2.60		10.85	2.29
	3rd		11.67	2.31		10.54	2.03		12.76	2.57		11.20	2.37
	4th		12.04	2.39		10.69	2.06		11.96	2.42		11.07	2.35
Obser. No. 4 12/22/26	Before inj.	2598	14.58	2.81	2595	10.22	1.96	2597	**	**	2394	13.01	2.72
1/2 mg.	After inj.												
	1st		11.50	2.22		8.37	1.62		13.66	2.66		13.59	2.85
	2nd		12.42	2.40		9.07	1.75		13.81	2.69		11.02	2.31
Obser. No. 5* 1/6/27	Before inj.	2839	11.02	1.94	2822	9.61	1.70	Died of pneumonia 12/24/26			2445	9.65	1.97
1/4 mg.	After inj.												
	1st		10.97	1.94		8.24	1.46					10.21	2.09
	2nd		10.65	1.88		9.53	1.69					10.38	2.13

**Lost.
*Thyroidectomy 12/23/26.

Ergotamine tartrate in the doses used causes a striking fall in heat production in normal rabbits without the occurrence of detectable untoward effects. The metabolism lowering effect of ergotamine tartrate was evident within an hour after its injection (the exact time of onset was not determined as our shortest observation period was 1 hour) and may last more than 8 hours. The fall in metabolism was proportional to the doses of the drug used. These rabbits were thyroidectomized, and after allowing 14 days for the metabolism to fall to the myxedema level, a single observation was made on three of them, using a dose of 1/4 mg. of ergotamine. This observation suggests that ergotamine also lowers the metabolism in the absence of most of the thyroid gland, though to a much less extent than in normal animals.

These experiments offer additional proof that ergotamine is a powerful sympathetic depressant and should be of value in the further study of the physiology and pathology of the vegetative nervous system. Ganter[5] has spoken of ergotamine as the "Atropine of the sympathetic." Ergotamine has already been extensively used in the treatment of exophthalmic goiter, as shown by the reports of Bouckaert,[4] Kliment,[6] Merke,[7] Ruetz,[8] Schönbauer,[9] Adlersberg and Porges,[10] Novons and Bouckaert,[11] and others. The reason for its trial in Graves' disease is obvious, *viz.*, that sympathetic stimulation, or at least loss of inhibitory control, is the outstanding physiological feature of the disease.

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