The lytic property of the Dochez and Griffith filtrates is relatively resistant to heat, one hour at 100°C. in the water bath being required to destroy it, although it is noticeably weakened after 40 minutes. The factor which inhibits clot formation is even more thermostable, since boiling for 1 hour seldom shows any weakening effects.

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Experimental Angina Pectoris in the Dog. Effect of Total Thyroidectomy.

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The clinical observation that the beneficial effect of total thyroidectomy in angina pectoris is an almost immediate one, and so cannot be due entirely to the fall in the basal metabolic rate which does not begin to occur for over a week, has given rise to speculation as to the possible mechanism involved.

We investigated the possibility that this effect might be due to interruption of nerve impulses from the heart. Our method was that described by Sutton and Lueth[1] for producing "experimental angina pectoris" in the dog consisting in placing a ligature about the anterior descending branch of the left coronary artery and compressing the coronary vessels by traction on this ligature. This method was successfully employed by White and his associates[2] to test the efficacy of various surgical procedures in interrupting the afferent nervous pathways of the heart. Five dogs were tested in this manner after removal of both thyroids. One animal was tested 5 hours after thyroidectomy, and 4 dogs on the eleventh, thirteenth, fourteenth, and twenty-eighth day respectively. A definite discomfort response was elicited in each instance. Two of the dogs had been similarly tested previous to the thyroidectomy and in these no diminution was noted in the amount of traction required to produce the typical response.

The relief of angina by removal of the thyroid may be due to the diminished sensitiveness to adrenalin[3] which has been demon-

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[1] Sutton, D. C., and Lueth, H. C., *Arch. Int. Med.*, 1930, **45**, 827.

[2] White, J. C., Garrey, W. E., and Atkins, J. A., *Arch. Surg.*, 1933, **26**, 765.

[3] Eppinger, E. C., and Levine, S. A., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 485.

strated clinically as early as 24 hours following the operation. This implies that the individual attacks of angina pectoris in a patient suffering from this disorder may be precipitated by a sudden increase in the patient's physiological output of adrenalin. We attempted to precipitate the discomfort response in dogs by injecting adrenalin. This was successfully accomplished in 9 dogs by applying a constant *subminimal traction* on the coronary suture by means of weights suspended over pulleys, and then raising the blood pressure suddenly by injecting adrenalin into the femoral vein. The amount of traction which was maintained without discomfort varied from 50 to 800 gm. and the dosage of adrenalin, which in the presence of this subminimal traction elicited the typical discomfort response, varied from 0.5 cc. of 1:10,000 to 0.2 cc. of 1:1,000 solution. In each case the injection of the same amount of adrenalin without the subminimal traction did not cause the slightest evidence of discomfort.

We believe that the production of discomfort in the dog by the above method probably simulates the attack of angina pectoris in humans more closely than does the older method in which direct traction alone is used.

It has been found possible to elicit the typical response by this indirect method after thyroidectomy as well as before. However, the nature of the procedure makes it impossible to repeat the exact experimental conditions a second time, so it is not possible to test accurately the effectiveness of the same dose of adrenalin following removal of the thyroid. We have studied the vaso-pressor effect of a given dosage of adrenalin before and after thyroidectomy in dogs, and although it has been markedly diminished in certain animals, this has not been a constant finding, perhaps due to the frequent occurrence of accessory thyroid tissue in the dog.