to 2,400 cc. of fluid have been injected. Thereafter, the rise is sustained. The absolute increase of metabolism is directly proportional to the original rate of metabolism. In shock the maximal metabolic response is reached at an earlier stage of the fluid injection, *i. e.*, after 700 cc. to 1,200 cc. of the solution have been given. Further administration of fluid results in a progressive decrease in the rate of oxygen consumption.

The tolerance of a normal healthy animal for water is great, so that fluid to the extent of 25% of the total body weight of the animal may be given without harmful effects. In shock, the tolerance of the organism is much diminished, inasmuch as the administration of a quantity of water equivalent to only 5% to 12% of the body weight is followed by a fall in the rate of metabolism. Animals suffering from the effects of shock showed a marked reduction in urine secretion. This was most evident where shock was accompanied by a diminution of the total bulk of circulating blood. The administration of water in amounts sufficient to depress the oxygen consumption rate of the shocked animals seemed to delay the establishment of a normal water diuresis.

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Effect of Total Thyroidectomy on Response to Injection of Adrenalin.

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Since Elliot's work in 1907, the increased sensitivity to adrenalin in vessels deprived of sympathetic innervation has been well known. Clinical observations on patients following total removal of the thyroid have suggested a close dependency of adrenalin efficiency on the presence of thyroid hormone. The injection of adrenalin in patients deprived of thyroid secretion seemed to produce less vasoconstriction. This diminished action of adrenalin was very striking in limbs rendered especially sensitive to adrenalin by sympathectomy.

To test the accuracy of these observations the following experiments were performed on dogs:

Dogs were trained to stand quietly in a light overhead harness. Skin temperature curves were made at the same time of each fore

leg by means of thermocouples attached to the skin. A number of such skin temperature curves under standard conditions revealed no difference between the fore legs. Being thus assured of a proper control, the sympathetic fibers supplying the left leg were destroyed by the removal of the stellate and each adjoining ganglion above and below. After allowing adequate time for the degeneration of the post-ganglionic fibers, determinations by the thermocouples revealed the customary 4° to 5° difference in temperature between the 2 legs. Skin temperature curves were now taken simultaneously on the 2 forelegs following an intravenous injection of a 1-20,000 solution of adrenalin chloride. The injections caused consistently a much greater and more prolonged fall in temperature on the operated side. When a number of similar curves were accumulated under identical standard conditions, the dogs were subjected to total thyroidectomy. After recovery and during the next 8 months temperature changes in both fore legs were again recorded following adrenalin injection. The post-thyroidectomy curves showed a great loss in the sensitivity of the sympathectomized vessels to adrenalin.

In the dogs deprived of thyroid secretion the former prompt pressor response and resulting abrupt and prolonged fall of tem-

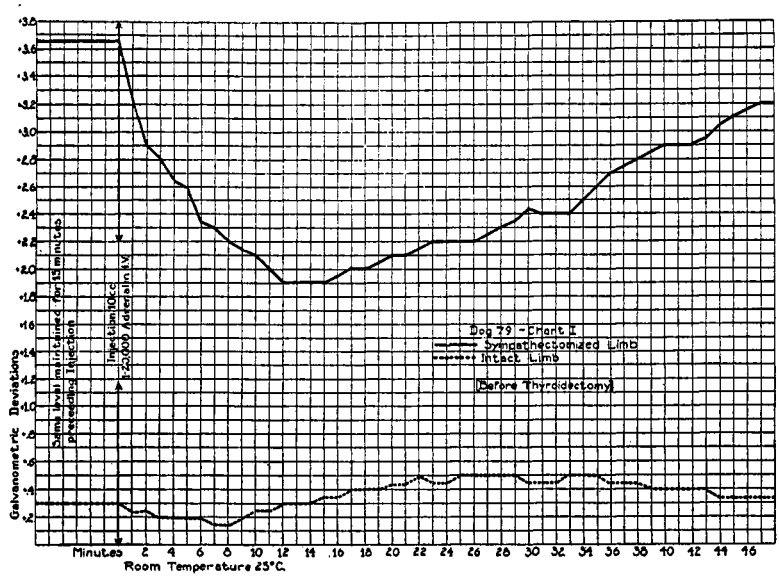

CHART 1.

Curves following injection of 10 cc. of 1-20,000 solution of adrenalin chloride intravenously before thyroidectomy. Note the immediate and prolonged fall of temperature in the sympathectomized limb. The intact limb responds vividly to the injection. The skin temperature changes are plotted in deviation units of the galvanometer used with the thermocouple.

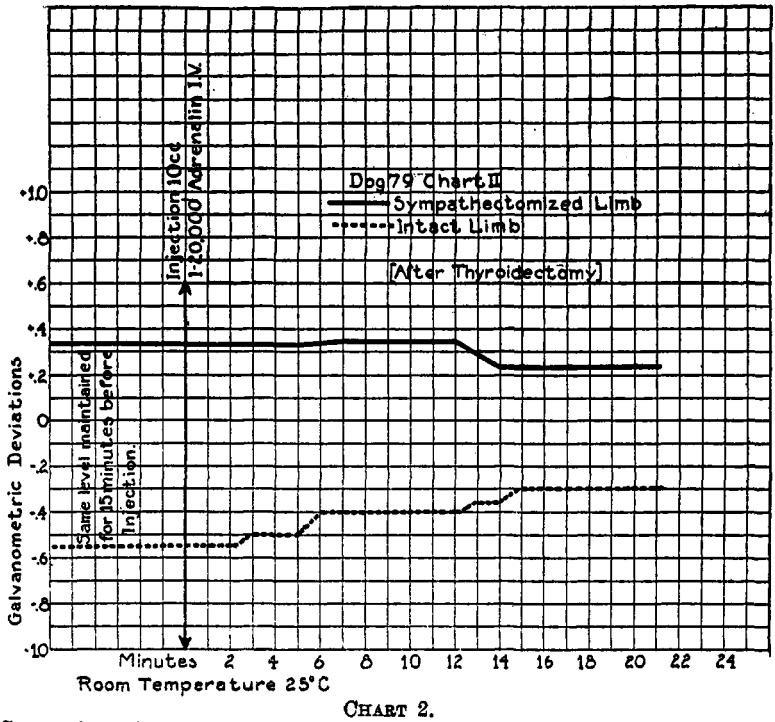

CHART 2.

Curves following total thyroidectomy. Note lack of temperature fall following the injection.

perature on the operated side was almost entirely abolished. The curves for the intact limb were but little changed by total thyroidectomy. These experiments served to confirm our clinical impressions of the direct relationship between the thyroid hormone and the effectiveness of circulating adrenalin.

The accompanying charts on Dog No. 79 are an example of the changes produced.