edly affect respiration reflexly through the sinus nerves, changes in blood-supply of the center can produce identical results. No qualitative differences have been disclosed; both influence depth of breathing more regularly and more readily than rate; both are effective only for a brief time after existing conditions of carotid pressure or cerebral flow have been changed, respiration returning toward normal when pressure or flow is maintained at a new level; both are rendered more effective by a preliminary period of subnormal carotid pressure or cerebral flow. The importance of carotid sinus (and aortic) reflexes in the respiratory responses of the intact animal to changes in blood-pressure can be determined only by quantitative data concerning relative intensities, relative sensitivities, latent periods, effective ranges, etc., of the reflexes on one hand, of alterations in blood-supply of the center on the other. The significance of sinus reflexes to the chemical regulation of breathing is more complicated than was supposed by Heymans;[5] in all probability factors are involved that have not yet been identified. Evidence now at hand suggests that sinus reflexes affect the respiratory center not directly, but through changes in caliber of the finer blood vessels supplying it. Experiments intended to yield quantitative data are being made.

5741

A Method of Assay of Extracts Containing the Suprarenal Cortical Hormone.

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This investigation was begun with the object of developing a method for the assay of extracts containing the cortical hormone which could be carried out with smaller amounts of extract than is required when bilateral adrenalectomized cats or dogs are used.

Hartman[1] has used the growth curve of treated suprarenalectomized rats of 100 to 150 gm. in weight as an alternative method of assay.

It was discovered that immature rats of the colony in this laboratory (Wistar strain) which has been inbred by us for a number of

[1] Hartman, F. A., and Thorn, G. W., PROC. SOC. EXP. BIOL. AND MED., 1930, **28**, 94.

years do not survive suprarenalectomy, except in rare instances. For example, of a group of 57 from which the glands were removed at 4 weeks of age, 56 had died on the tenth day. A search of the literature did not reveal any data indicating the ability of such young rats to survive bilateral suprarenalectomy and there has been little agreement between the results of various authors concerning the survival period of suprarenalectomized adults. It seemed advisable, therefore, to investigate the possibility of using such animals for the standardization of potent extracts of the cortical hormone. The results of this study are most encouraging, and it is suggested that a rat unit be taken as the minimum daily dose of extract which will protect (for at least 20 days) 50% of a group of animals suprarenalectomized at 28 days of age, the extract being administered subcutaneously twice daily. Table I illustrates an experiment in which the potency of an extract has been demonstrated.

TABLE I. *Assay of Extract.*

Rats Used	Daily Dose. Equiv. in gm. of original glands	Rats not surviving 20 days	Remarks
	gm.		
2	15	0	Normal growth rate after recovery from operation.
2	10	0	Normal growth rate after recovery from operation.
2	5	0	Slightly less than normal growth rate after recovery.
5	2	3	Reduced growth rate in survivors.
2	1.5	2	
2	1.0	2	
2	0.5	2	

The extracts used at first were made according to Swingle and Pfiffner's[2] method. Later it was found that the following simplified process was satisfactory.

The whole glands (beef) were first extracted with an equal volume of absolute acetone. The acetone extract was concentrated at low temperature and pressure to one-thirtieth of its original volume. The concentrate was extracted 5 times with benzene. The combined benzene extracts were reduced in volume at low temperature and pressure and subsequently washed with 4% sodium bicarbonate solution until all adrenalin was removed. After further concentration, the benzene extract was converted into a water extract as follows: An equal volume of water was added to the benzene solution

[2] Swingle and Pfiffner, *Am. J. Physiol.*, 1931, **96**, 164, 180.

and the benzene was removed by distillation. Acetic acid was added to the watery extract until maximum precipitation of lipoid was obtained. The precipitate of lipoid was removed by filtration. The filtrate was clear and almost colorless. It was made to represent 15 gm. of whole glands per cc.

5742

Influence of Laughter on Muscle Tone.

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This study had its inception in the observation that in narcolepsy there occur attacks of cataplexy or tonelessness on emotion, especially during laughter and mirth. It was thought worth while to study by objective methods the effect of laughter on muscle tone.

The apparatus used was devised by Dr. L. C. Hutchinson of the University of Minnesota. The method consists essentially of passively flexing the forearm at a constant speed against a flat spring. The greater the resistance offered by the arm, the greater was the deflection of the spring. The spring was connected with a writing lever in such a way that the writing lever rose or fell with increasing or decreasing deflections of the spring. In this way the writer lever writing on a smoked drum described a tracing.

Experiments were done on 50 normal subjects. The first reading was taken with a calm facial expression. Then a reading was taken during laughter. Laughter was induced. In no instance was any considerable amount of mirth present but not all spontaneous laughter is due to mirth. It was thought possible that changes in muscle tone seen on laughter were due to the fact that the subject was distracted by his laughter, for this reason control readings were taken with the subject frowning to rule out the effect of distraction.

It was thought that the best method of measuring variations in muscle tone under the varying conditions of the experiment was to determine the differences in the amount of work done in passively moving the arm a certain distance. Since the area underneath a curve is an indicator of the amount of work done, the measurement of these areas and their comparison afforded a convenient method for the interpretation of the results. The area measured in each tracing was one resembling a right angled triangle. The base was