to rabbits employed in another experiment where, in somewhat larger doses, it rapidly produced toxic symptoms.

The number of animals used in this experiment is, of course, too small on which to base any definite statement, but in the thyroidectomized group of males it appears to point to the fact that thyroid feeding does prevent the enlargement of the pituitary which would otherwise follow on removal of the thyroid.

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Method in the investigation of sensibility after the section of a cutaneous nerve. (Preliminary communication.)

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The difficulty of obtaining from clinical subjects, untrained in introspection, reliable accounts of the changes in cutaneous sensibility occurring during the regeneration of a cutaneous nerve has been partially obviated by Head[1] and by Trotter and Davies[2] through the use of the experimental method with themselves as subjects. These observers, however, did not take the precaution to make sure of their own ability to give the most accurate descriptions of cutaneous complexes, nor did they work with areas small enough to permit the application of the most exact experimental methods available. For this reason the writer has sought to conduct an experiment with such changes in procedure as should make for a more detailed and thorough description of the sensations involved. The writer acted as subject, and the conditions of the experiment were established by a section of the anterior branch of the internal cutaneous nerve. The following points may be noted:

1. A special attempt was made, during the year preceding the operation, to train the subject in the observation of cutaneous sensation and in the analysis of the sensational complexes mediated by the normal skin. Care was taken to distinguish between the

[1] *Brain*, 28, 1905, 99; 31, 1908, 323.

[2] *Jour. Physiol.*, 38, 1909, 134.

qualities of cutaneous contact, cutaneous pressure, and deep pressure, all of which can be distinguished by practice; between warmth, heat, and burning heat (the last two are complex); and to some extent between the different modes of cutaneous pain. Besides this special training, the subject has had the advantage of general introspective practice, obtained during several years of psychological investigation.

2. The final introspective practice series were so arranged as to supply objective norms for that area of the skin which was afterwards affected.

3. The selection of the nerve for section was such that the region affected was sufficiently small to permit of a more careful exploration than would have been possible if it had been necessary to cover a large area.

4. Except for purposes of comparison with other researches, areal stimuli were discarded as not sufficiently adapted to the investigation of the skin, in which sensibility is distributed in a punctiform manner. Emphasis was laid upon the isolation of the separate sensory spots, and an effort was made to determine, not only the strength of stimulus which would just arouse sensation in each one of these spots, but also the intensity of sensation aroused in each one by a constant strength of stimulus. For pressure, hairs were employed; and for pain, two needle algesimeters. Warmth and cold were studied by means of a hollow brass cylinder through which water of different temperatures was passed. The cylinder was drawn over the skin by a kinesimeter,[1] which controlled the rate of exploration and the pressure of the stimulus; a record of the position and of the intensity-value of the spots was taken simultaneously on a kymograph drum.

5. Orientation on the surface of the arm was obtained in most of the work by means of coördinate lines, impressed in a given relation to a set of tattoo marks by a rubber stamp. More accurate localization of the points was secured by placing the arm in a permanent plaster cast, to which was rigidly attached a vernier stage, carrying an indicator, that moved just over the surface of the skin. By reference to the indicator and the vernier scales, points could be identified to within less than one half of a millimeter.

[1] *Am. Jour. Psychol.*, 6, 1894, 424; 7, 1895, 150.

The section of the nerve was performed in January, 1913, and sensibility, at the time of writing, is not yet normal. It is, therefore, too early to present any definite conclusions. In general, however, the following points, subject to such modification in details as a subsequent working over of the data in the light of the completed experiment may necessitate, may be noted: (1) The section of the cutaneous nerve did not destroy the sensibility of the subcutaneous tissue, which provided to a considerable extent the capacity for localization. (2) With the exception of certain early general pains, that were probably, strictly speaking, not of cutaneous origin, it may be said that the return of warmth, cold, pressure, and pain began at approximately the same time. (3) The regions insensitive to these four qualities of sensations, both immediately after the section of the nerve and during the period of returning sensibility, were approximately, but by no means exactly, the same. (4) On the whole, the return of sensitivity tended to begin at the outside of the affected area and to progress toward the center, although decided irregularities in this course appeared. (5) In general, hypoesthesia preceded normal sensitivity, periods of hyperesthesia, however, being noted for pain and for cold. (6) The observations up to the present time indicate that the return to normal sensitivity will not be simultaneous in the cases of the four sense qualities and that the return in the case of temperature sensations is the more rapid.

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The alleged discharge of the internal secretion of the pancreas into the lymph.

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In 1898 Biedel[1] reported a "new form of experimental diabetes" by ligation of the thoracic duct and by establishing a fistula of the thoracic duct. These results were interpreted as proving that the internal secretion of the pancreas reaches the blood indirectly via the lymph of the thoracic duct, and led to attempts to modify or control diabetes by treatment with lymph from the thoracic

[1] Beidl, *Centralb. f. Physiol.*, XII, p. 624.