kidney extract than with dog kidney extract. Again, goose serum is much more effective in causing inhibition when combined with goose kidney extract. On the other hand, in those sera and extracts which tend to cause acceleration of coagulation, most marked accelerations are always noted when homologous combinations are used. Thus the greatest acceleration is noted when ox serum is combined with ox kidney extract or when sheep serum is combined with sheep kidney extract.

From these data it appears that not only are accelerating and inhibiting substances developed in combinations of sera and extracts, but that the latter are specifically adapted to each other so as to be most effective when homologous factors are combined.

4820

Oral Administration of Anterior Pituitary Tablets and Our Laboratory Preparations on Compensatory Hypertrophy of Thyroid Gland.

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In earlier investigations Loeb,[1] and Loeb and Kaplan[2] have shown that the compensatory hypertrophy of the thyroid gland of guinea pigs which takes place after extirpation of a great part of this organ, is very much diminished or entirely prevented if, following the extirpation, daily a tablet of Armour's anterior pituitary substance is fed to guinea pigs. In our first publication, we considered whether the effect observed by us was due to the anterior pituitary preparations as such or to an admixture. Analysis of the action of iodine preparations on the compensatory hypertrophy of the thyroid gland allowed us to exclude the addition of this substance as the cause of the prevention of compensatory hypertrophy. Furthermore, H. A. McCordock[3] showed in this laboratory that Armour's tablets prevent also the marked increase in mitoses in the thyroid otherwise produced by administration of KI to guinea pigs. We had planned several years ago to compare with the effect of Armour's preparation, the effect of oral administration of anterior pituitary of cattle prepared by

[1] Loeb, Leo, *J. Med. Res.*, 1920, xl, 481; *Am. J. Path.*, 1929, v, 71.

[2] Loeb, Leo, and Kaplan, E. E., *J. Med. Res.*, 1924, xliv, 557.

[3] McCordock, H. A., *Am. J. Path.*, 1929, v, 171.

ourselves from fresh anterior pituitary obtained from the slaughter house. Only within the last year was it possible for us to carry out these plans. We dried the anterior pituitary of cattle after it had been cut into small pieces, and powdered it. Pills were then made from the powdered substance, each pill containing the same amount of anterior pituitary substance as one tablet of Armour & Co. We used for our experiments 54 guinea pigs. From each animal the thyroid lobe of one side and either one-half or two-thirds of the other side was removed. One-third of the animals was fed daily with tablets of the Armour preparation, and a second third was fed with pills prepared in our laboratory, while the last third did not receive anterior substance; it served as a control set. The remaining parts of the thyroid gland were removed for microscopic examination at periods varying between 20 and 30 days. Our results can be briefly stated as follows:

In every case the acinar epithelium of the thyroid of the guinea pigs fed with Armour's preparation was, on the whole, low and the colloid hard; the acini themselves were relatively small. Peripheral vacuolization in the colloid was usually lacking and mitoses were not seen. However, in some cases, a small area of the periphery of the remaining part of the gland showed some increase in size of the epithelium and a loss of colloid. In all probability we have to deal here with a localized stimulating effect of the cut or of the nearness of the ligature; such a change was not found throughout the gland, as is the case in controls when we have to deal with real compensatory hypertrophy.

The remaining parts of the thyroid of guinea pigs fed with anterior pituitary gland prepared in our laboratory behaved quite differently. This preparation did not prevent compensatory hypertrophy. It is probable that it diminished it slightly, but there occurred some variations in this respect. For instance in one case the control animal had lost considerable weight and died at the end of the experiment. The thyroid tissue of the guinea pig fed with our preparation of anterior pituitary showed accordingly more hypertrophy than the control. However, we can state that our own preparation of anterior pituitary did not prevent compensatory hypertrophy; it was much less effective than Armour's preparation. This was already noticeable at the time of the removal of the remaining part of the gland for purposes of microscopic examination; the guinea pigs fed with Armour tablets showed the smallest remnants of the thyroid. On the average, all 3 classes of guinea pigs gained in weight during the course of the experiment; but those fed

with Armour's preparation gained much less than the others. However, there was some variation in this respect between individual animals and the difference in the weight curves cannot account for the lack of compensatory hypertrophy in the group fed with Armour's tablets.

We have no reason for assuming that the cause of this difference is due to the admixture of another substance to the anterior pituitary. Dr. F. Fenger was kind enough to give us a detailed description of their mode of preparing the Armour anterior pituitary tablets. There are some differences in their and our own technique, and it is possible that this accounts for the differences in the effects obtained with the 2 preparations. In experiments which we have already begun, we shall attempt to separate the 2 substances responsible for the 2 opposite effects on the thyroid gland of the guinea pig which we found in certain preparations of anterior pituitary gland.

4821

Effect of Anoxemia, Carbon Dioxide and Lactic Acid on the Autonomic Fibers of Somatic and Visceral Nerves.

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In a previous paper,[1] the effects of anoxemia, CO_2 and lactic acid on certain fibers of somatic nerves were described. Further investigations by the author[2] and by Heinbecker and Bishop[3] have identified in autonomic nerves 2 other components of potential which possess properties different from those previously described by Gasser and Erlanger.[4] Similar action potentials traced by Erlanger and Gasser[5] from sympathetic rami into somatic nerves and thoroughly studied there by them apparently arise from similar fibers. We have found their potentials to have the same properties there as in autonomic nerves. These fibers have a higher threshold, a slower conduction

[1] Heinbecker, Peter, *Am. J. Physiol.*, 1929, lxxxix, 58.

[2] Heinbecker, Peter, PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 349.

[3] Heinbecker, P., and Bishop, George H., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 645.

[4] Gasser, H. S., and Erlanger, Joseph, *Am. J. Physiol.*, 1927, lxxx, 522.

[5] Erlanger, Joseph, and Gasser, H. S., *Am. J. Physiol.*, 1929, in press.