are carbohydrates as chemically distinct as they are serologically. Because of the preliminary nature of the data, however, they are being reserved for more complete study.

In contrast to the type-specificity of the carbohydrate, is the species-specificity of the "nucleoproteins" derived from the organisms. While the proteins are obviously mixtures, it is nevertheless clear that these solutions react in common in homologous and heterologous antisera.

It is interesting to point out a recent observation in 2 patients, one ill with a Staphylococcus septicemia, the other with osteomyelitis due to the same organism. With convalescence both patients exhibited a marked skin reactivity to 0.1 cc. of a 1-50,000 dilution of the carbohydrate of Type A, but not Type B. Coincident with the development of heightened skin reactivity, the blood serum of the patients showed a high titre of precipitins for the homologous carbohydrate.

7388 P

Effect of Irradiation of Hypophysis on Experimental Diabetes.

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Various investigators have presented evidence to show that the hypophysis plays an important rôle in carbohydrate metabolism. The first conclusive evidence is that of Houssay and coworkers, who found (1) that extracts of the anterior lobe of the hypophysis injected into normal dogs produce hyperglycemia, glycosuria and ketonuria, and when injected into depancreatized dogs, an increase in severity of the diabetes;[1, 2] (2) that removal of the hypophysis in normal dogs leads to a hypersensitivity to insulin,[3] hypoglycemic convulsions during fasting, and an increased tolerance to glucose;[4, 5] (3) that in depancreatized dogs, removal of the hypophysis restores the carbohydrate metabolism to an approximately normal condition,

[1] Houssay, B. A., and Biasotti, A., *Rev. Soc. Argent. Biol.*, 1931, **7**, 3.

[2] Houssay, B. A., *Klin. Wchnschr.*, 1933, **12**, 773.

[3] Houssay, B. A., and Magenta, M. A., *C. R. Soc. Biol.*, Paris, 1925, **92**, 822.

[4] Braier, B., *Rev. Soc. Argent. Biol.*, 1931, **7**, 140.

[5] Houssay, B. A., and Biasotti, A., *Endocrinology*, 1931, **15**, 511.

but renders the animal hypersensitive to insulin;[6, 7] that injection of active anterior-lobe extracts causes a reappearance of the symptoms of diabetes in hypophysectomized-depancreatized dogs.[8] These findings have been largely confirmed by the work of Evans *et al.*,[9] Barnes and Regan,[10] Daggs and Eaton,[11] and Corkill *et al.*[12]

Since the removal of the hypophysis decreases the symptoms of experimental diabetes, it was thought that destructive doses of X-ray to the hypophysis might produce similar results.

Six dogs were depancreatized and allowed to recover under insulin administration. About one week after operation they were placed on a basic diet of dog biscuits, cane sugar and freshly ground meat, to which was added liberal amounts of fresh or dried pancreas. Approximately 2 units of insulin per kilo body weight were given twice daily at the time of feeding. After the wound had healed completely, usually within 3 weeks, food and insulin were withheld for a period of 18 to 20 hours, and the tolerance of the animal to orally administered glucose was determined. After taking an initial blood sample, 1.75 gm. glucose per kilo was given by stomach tube, and further blood samples were taken at 15, 45, 75, and 105 minute intervals. Blood sugar was determined by Folin's method.

Following one or more control glucose tolerance tests, the animals were treated with varying doses of X-rays. During the treatment the animals were anesthetized with nembutal, and tied to a support which held the head securely in any desired position. In the irradiation, 140 kilovolts with 5 milliamperes were used at a distance of 40 to 50 cm., with one-half mm. copper and one mm. aluminum filtration. The rays were directed to the hypophysis through one dorsal and 2 lateral ports, obtaining a cross-firing effect. The duration of treatment varied from 90 to 240 minutes for each port. In 3 of the animals treatment was repeated after 3 weeks with a larger dose. The total duration of irradiation per port for the 6 animals was 100, 180, 90 plus 180, 120 plus 180, 130 plus 240, and 240 minutes respectively. Epilation occurred 3 weeks after irradiation in all ani-

[6] Houssay, B. A., and Biasotti, A., *Rev. Soc. Argent. Biol.*, 1930, **6**, 251.

[7] Houssay, B. A., and Biasotti, A., *Pfluger's Archiv. ges. Physiol.*, 1931, **227**, 664.

[8] Houssay, B. A., Biasotti, A., and Rietti, C. T., *Rev. Soc. Argent. Biol.*, 1932, **8**, 469.

[9] Evans, H. M., Meyer, K., Simpson, M. E., and Reichert, F. L., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 857.

[10] Barnes, B. O., and Regan, J. F., *Endocrinology*, 1933, **17**, 522.

[11] Daggs, R. G., and Eaton, A. G., *Am. J. Phys.*, 1933, **106**, 299.

[12] Corkill, A. B., White, H. P., and White, W. E., *J. Physiol.*, 1933, **80**, 193.

mals which received a minimum of 130 minutes per port. Following irradiation, glucose tolerance tests were made weekly for periods of 3 to 5 weeks. In no instance did the fasting blood sugar or the tolerance curve indicate that the treatment had been beneficial within this period. The fasting blood sugar remained between 300 and 600 mg. %, the animals did not become hypersensitive to insulin as do hypophysectomized-depancreatized dogs, and the insulin dosage was not reduced.

This work is being continued with larger doses of X-rays, and a histological study is being made of the pituitary and other irradiated areas of the brain, and also of the thyroid, adrenals, and gonads to determine the effects of the irradiation.

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7389 P

Effects of Brain Cautery on Fetal Development in the Rat.

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The primary purpose of this study is to determine whether the fetus can survive extensive damage to the brain, and the possible effects of brain injury on subsequent growth and development. Previous studies have been almost entirely confined to observations on teratological (anencephalic) human material (Preyer,[1] Bruns *et al.*,[2] Nañagas,[3] Marcus and Nickman[4]).

Destruction of portions of the fetal brain (rat*) was accomplished by means of the electric cautery. No repair was found necessary other than suture of the maternal body wall (Nicholas[5]). Fetuses recovered from the uterus or taken at birth subsequent to such procedure were examined as to behavior, measured, weighed

1 Preyer, W., *Specielle Physiologie des Embryo*, 1885.

2 Bruns, I., Cranen, A., and Ziehen, Th., *Hand. d. Nerven. Krankh. im Kindesalter*, Berlin, 1912.

3 Nañagas, J. C., *Am. J. Anat.*, 1925, **35**, 455.

4 Marcus, J. H., and Nickman, E. H., *Arch. Pediat.*, 1930, **47**, 739.

* The rats used in this study were obtained through the generosity of the Wistar Institute of Anatomy and Biology.

5 Nicholas, J. S., *Anat. Rec.*, 1925, **31**, 385; PROC. SOC. EXP. BIOL. AND MED., 1926, **23**, 436.