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which suggests that the non-specific effect of tissue injections is not responsible for the results.

The rabbit test proposed by De Wesselow and Griffiths¹ to differentiate insulin-sensitive and insulin-insensitive diabetics has failed to do this in our hands. While differences in technic may explain this, it appears that there are more fundamental difficulties to be overcome before a clinical assay of contra-insular mechanisms by this method is possible. The nature of these difficulties has been fully discussed by De Wesselow and Griffiths⁴ in relation to the use of glucose and insulin in diabetics.

The confirmation of the insulin antagonistic action of whole pituitary extracts in rabbits needs no comment.^{5, 6} It is so definite that it suggests a contrast rather than a similarity between these experiments and clinical diabetes.

Summary. The response of rabbits to insulin before and after the injection of diabetic serum has not, in our experience, afforded a means of distinguishing different types of diabetes. The inhibition of the response of the blood sugar to insulin in rabbits after the injection of pituitary extract has been confirmed.

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Infection with *Trypanosoma lewisi* in the Hypophysectomized Rat.

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Trypanosoma lewisi is a natural parasite of the blood of wild rats, and can be transferred easily to laboratory rats. After inoculation to normal adult rats, it produces a blood stream infection of considerable intensity, although only rarely does the infected animal die. At the end of a patent period ranging from a few day to several weeks, the animals usually clear themselves of the infection and thereafter wholly resist reinfection with this parasite.¹ In the pres-

⁴ De Wesselow, O. L. V., and Griffiths, W. J., *Quart. J. Med.*, 1938, 7, 17.

⁵ Cope, O., and Marks, H. P., *J. Physiol.*, 1934, 83, 157.

⁶ Young, F. G., *J. Physiol.*, 1936, 87, 13P.

¹ Taliaferro, W. H. "The Immunology of Parasitic Infections," New York, Century, 1929.

ent paper are reported the results of infecting hypophysectomized rats with *Trypanosoma lewisi*. As will be seen, the hypophysectomized rat dies after infection with this parasite, death occurring in most cases 5 days after the parasite is injected.

Procedure. The experimental work was designed: (1) to compare infection with *Tryp. lewisi* in hypophysectomized rats with that in control rats,* and (2) to study the effect of the administration of anterior pituitary extract upon the infection in the hypophysectomized rats. Thirty-three rats 60 days old were used for the first purpose of the work, 19 being hypophysectomized† and 14 serving as controls. At infection, all animals were given one million *Tryp. lewisi* intraperitoneally. The hypophysectomized rats, together with 12 of the control rats which were subjected to the identical operative procedure except for the removal of the hypophysis, were infected from 5 to 10 days after operation. The 2 remaining control rats were normal unoperated animals. For the second purpose of the work, 14 hypophysectomized rats, infected 5 days after operation, were treated subcutaneously or intraperitoneally daily with 10 rat units of E. R. Squibb and Sons' anterior pituitary extract‡ beginning the first day after operation and continuing until death or recovery from the infection. It was thought that growth factors in this extract might nullify the effects of the parasite in the hypophysectomized rats. All of the animals used in these experiments were examined practically every day, the parasites being estimated by counts with the hemocytometer or, early in the patent period, by direct observation of a drop of fresh blood with the "high-dry" power ($\times 430$) of the microscope.

* The strain of *Trypanosoma lewisi* was obtained from Dr. L. Reiner, Director of Research, the Burroughs Wellcome and Company, Tuckahoe, New York. The rats were of the Long-Evans strain, bred in this laboratory of stock obtained from Dr. P. E. Smith of the Department of Anatomy of the College of Physicians and Surgeons. They were maintained upon the McCollum diet consisting of ground whole wheat (67.5%), whole milk powder (10%), milk fat (5%), casein (15%), sodium chloride (1%), and calcium carbonate (1.5%).

† The method of hypophysectomy was in principle the parapharyngeal approach of Smith,² although the actual operative procedure used was modified from that of Selye.³ Of over 200 rats operated upon by one of us (N.M.) but not infected with *Trypanosoma lewisi*, death from the operation occurred in only two, and the remainder survived regularly for at least 50 days.

² Smith, P. E., *Am. J. Anat.*, 1930, **45**, 205.

³ Selye, H., *Virchow's Arch.*, 1933, **290**, 23.

‡ Kindly supplied by the endocrine clinic of the Presbyterian Hospital (Dr. R. Kurzrok), New York City.

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TABLE I.
Summary of Results of Infecting Hypophysectomized Rats and Control Rats with
Tryp. lewisi.

Group	No. of rats	Treatment	No. dead	Avg survival time (days) of those dead	Avg <i>T. lewisi</i> /mm. ³ on 4th day of infection
Hypophysectomized	19	None	19	5.4	90,000
Operated controls	12	"	2	7.5	85,000
Unoperated "	2	"	0	—	65,000
Hypophysectomized	14	Ant. pituitary extract (Squibb)*	8	4.8	107,000

* 10 rat units daily.

Results. All of the 19 hypophysectomized rats given no pituitary extract died after infection with *Tryp. lewisi*. The intensity of infection in these animals did not exceed that in the controls, although death generally came at about the time of the peak of the infection, *i. e.*, 5 days after infection. Two deaths occurred among the 12 operated control animals, although the 10 remaining operated controls as well as 2 unoperated controls survived the infection with no apparent difficulty. The hypophysectomized rats did not suffer an anemia more severe than that generally observed in the normal rat during this infection, and blood films treated with Wright's stain were free of *Bartonella muris*. Death was precipitous and convulsive, resembling that from "pathogenic" trypanosomes in the rat. The attempt to replace the hypophysis by administration of anterior pituitary extract was successful in only 6 of 14 animals, the remaining 8 rats succumbing to the infection. The cause of failure of the extract to protect the rats which died is obscure. However, since endocrine extracts are as yet comparatively crude products, they are sometimes irregular in the effects which they produce. Furthermore, it is possible that the type of extract used was not the most effective one functionally to replace the pituitary under the conditions of this experiment. All animals were autopsied at death; the spleen was invariably enlarged from one to 3 times, and the lungs were invariably slightly or deeply hemorrhagic. In many autopsies upon nonhypophysectomized rats with *Tryp. lewisi*, no such congestion of the lung has been noted in this laboratory.