very low in the work of Lipschütz and fellow workers during the last 4 years. On the other hand, there was considerable individual variation as to the degree of the fibromatous reaction, which may range between 0.5 and 12 according to our classification.[4] For this reason too much importance should not be attributed as yet to the coincidence in the average total tumoral effect in animals of high and low body weight.

Summary. Uterine and extragenital fibroids were elicited by subcutaneous administration of estradiol monobenzoate in castrate female guinea pigs weighing no more than 180 to 245 g at the beginning of treatment and autopsied 2½ to 3 months later before they reached a body weight of 500 g. The incidence of abdominal fibroids in these young animals was no less than in a group of adult or aged animals weighing 700 to 1050 g at the beginning of treatment. Whereas this statement referring to the occurrence of experimental abdominal fibroids in young females seems definite, the question remains open whether age may influence the degree of the fibromatous reaction, *i. e.,* size and number of fibroids.

13396

Urinary Excretion of Trichina Antigen in Experimental Trichinosis.*

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The elimination by the kidneys of substances derived from bacterial cells has been noted in several human infections such as the urinary excretion of capsular polysaccharide in pneumococcal infections,[1] and the excretion of scarlatinal toxin in scarlet fever.[2] It is probable that this mechanism is operative in a number of bacterial infections although the field has not been adequately explored. The present note describes an example of the same phenomenon in an experimental disease of parasitic origin.

In this study the urinary excretion of an antigenic substance, or

* Aided by a grant from the Fluid Research Fund, Yale University School of Medicine.

1 Dochez, A. R., and Avery, O. T., PROC. SOC. EXP. BIOL. AND MED., 1917, **14**, 126.

2 Trask, J. D., and Blake, F. G., *J. Exp. Med.*, 1924, **40**, 381.

substances, derived from *Trichinella spiralis* was observed in experimentally infested rhesus monkeys. Infestation was accomplished by feeding by stomach tube approximately one trichina larva per gram of body weight to 2 monkeys *(Macaca mulatta)*. Following infestation the monkeys were observed for 10-12 weeks respectively, for the following items: daily temperature, general behavior and physical phenomena, eosinophilia, skin reaction to trichina antigen, trichina antigen in serum and urine, and trichina antibody in serum.

Methods. Twenty-four-hour samples of urine were collected in metabolism cages at stated intervals (Fig. 1). This urine was dialyzed for 15 hours through cellophane tubing against tap water at icebox temperature to remove excess salts. The urine was then evaporated to dryness in Petri dishes at room temperature. The dried urine sediment was redissolved in about 5 cc sterile saline and centrifuged and the supernatant fluid was saved and used in the precipitin tests. The final volume represented approximately a 10-fold concentration.

Trichina antigen in serum and urine was demonstrated by precipitin reactions using rabbit serum having a high titer of trichina antibody.† The trichina antibody in monkey sera was demonstrated by precipitin reactions employing dilutions of trichina antigen‡ prepared from dried larvae by a method described by Witebsky.[3] The serum-antigen mixtures were incubated at 37°C in tubes 4 mm inside diameter for one hour and then allowed to stand over night in the icebox. Tests for trichina antigen in urine were read at 24 and 48 hours; flocculation first appearing in 48 hours was designated as 1+, and that appearing in 24 hours as 2+. The readings of tests in the cases of serum antigen and antibody were made in 24 hours. Skin tests were performed with 1:500 solution of trichina antigen in the skin of eyelid. At postmortem in each instance trichina larvae were demonstrated in the respective diaphragmatic muscle and both monkeys were found to have widespread tuberculosis, as had been expected.

Results. As the course and results in the infested monkeys were approximately the same in both, one representative chart may suffice to indicate what happened in each animal. The prolonged urinary excretion of trichina antigen over a period of at least 50 to 70 days is

† I am indebted to Dr. E. Witebsky of the University of Buffalo Medical School for a supply of trichina antiserum.

‡ I am indebted to the Eli Lilly Drug Company for a supply of dried trichina larvæ.

3 Witebsky, E., Wels, P., and Heide, A., *J. Bact.*, 1941, **41**, 65.

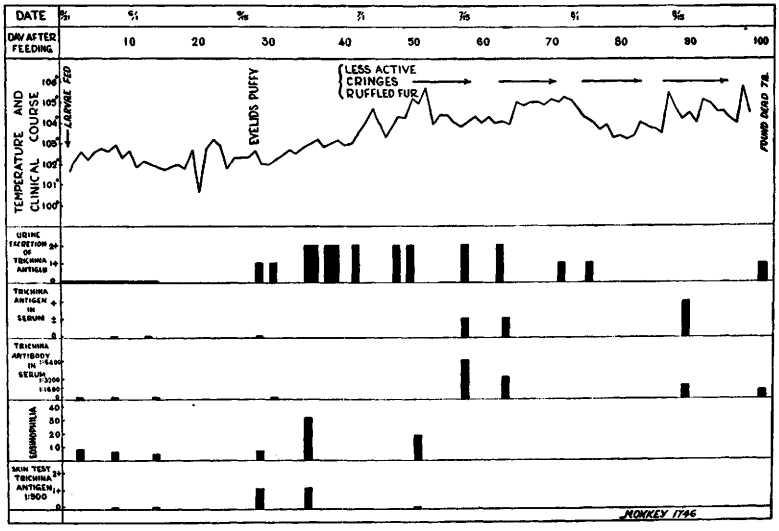

FIG. 1.

Temperature chart, tests for urinary antigen, blood antigen and antibody; eosinophilia and skin tests in one of two monkeys experimentally infested with trichina larvæ.

in some contrast to the eosinophilia and positive skin tests which, occurring early in the disease, were of shorter duration. Some of the fever during the last few weeks of the monkey's life was no doubt due to tuberculosis.

Fig. 1 represents graphically the clinical course and immunological data on one of 2 experimentally trichina infested monkeys and is self-explanatory.

McCoy[4] claimed that the symptoms of fever, edema and eosinophilia did not appear in the monkeys he had infested with trichinae. Our results are contrary to his findings.

Comment. Antigen was present in both blood and urine during early and late stages of a heavy infestation of experimentally induced trichinosis. Moreover, the antigen in the serum existed in a free (or, at least, easily demonstrable) form in the presence of antibody. The continued urinary excretion of the antigen over a period of weeks is noteworthy.

Conclusions. 1. Rhesus monkeys infested with trichina larvae may develop fever, edema, and eosinophilia. 2. Trichina antigen is demonstrable in the serum and urine of trichina infested monkeys over a period of several weeks and at a time when trichina antibody is also demonstrable in the serum of these monkeys.

[4] McCoy, O. R., PROC. SOC. EXP. BIOL. AND MED., 1932, **30**, 85.