cooperation and, indeed, collaboration of our associate, Dr. Benjamin White, who is continuing to take an active part in the further studies of the pneumococcus serum and is beginning to apply the method to scarlet fever serum production. In collaboration with Dr. White, we are further attempting the effects of using this method with some other bacteria.

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Effect of menotoxin injections on behavior of rats in the maze.

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Macht and Lubin[1] have described their studies on menotoxin first in these Proceedings and later in a fuller communication elsewhere.[2] It was shown that in the blood, sweat, saliva, milk and other secretions of menstruating women there is present a toxin, which is especially deleterious to plant protoplasm, but is also to a lesser degree toxic for animals and animal tissues. The chemical nature of this toxin was found by them to bear a relationship to oxycholesterin and allied bodies such as cholic acid.

It is well known that at the time of catamenia, the female organism undergoes profound metabolic and other physiological changes. Very common concomitants of menstruation are pain, malaise, nervous irritability, and psychic disturbances. In the present investigation an inquiry was made as to whether such symptoms may not be referred to the presence of menstrual toxins. Albino rats were trained to run in the circular maze, so as to perform that exercise in the shortest period of time and without errors. The rats were then injected with normal human blood serum on the one hand, and with blood serum from menstruating women, on the other hand, and the effect of the injections was observed. In order to avoid anaphylactic phenomena

[1] Macht, D. I., and Lubin, D., PROC. SOC. EXP. BIOL. AND MED., 1923, xx, 265.

[2] Macht, D. I., and Lubin, D., *J. Pharm. and Exp. Therap.*, 1924, xxii, 413.

the injections were made in different rats, and when the same rats were used again, it was only after a long period of rest. Fifteen experiments were made with injections of normal human serum, and twenty-one with menstrual serum, the doses injected ranging from 0.01 cc. to 0.2 cc.

It was found that injections of normal serum produced no effect, or occasionally a slight transient depression. Injections of menstrual serum produced very marked depression of the animals, as manifested by their speed of running, loss of orientation, and numerous errors and frequently there was a distinct paresis of the hind legs. Recovery almost invariably followed in a day or two. Injections with alcoholic extracts of normal blood serum (evaporated and taken up in saline) and of menstrual serum gave exactly similar results as above. The results obtained in the rats were somewhat analogous to those obtained by the authors with cholic acid and cholesterin derivatives which are closely related to menstrual toxin.[3]

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A study of the toxin of pernicious anemia.

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In a paper on the toxin of menstruation, Macht and Lubin[1] have shown that by means of phyto-pharmacological preparations, the presence of a poison or toxin in the blood menstruating individuals can be detected. While examining specimens of blood from normal and menstruating women the author happened to test a specimen of blood from a case of pernicious anemia and found it to be highly toxic for plants. The toxicity was even greater than the most toxic specimens of menstrual blood. Inasmuch as the above specimen came from a man it was thought worth while to study other cases of pernicious anemia by the

[3] Macht, D. I., and Hyndman, O., *J. Pharm. and Exp. Therap.*, 1924, xxii, 467.

[1] Macht, D. I., and Lubin, D., *J. Pharm. and Exp. Therap.*, 1924, xxii, 413.