24 hours. The actual test was assembled by mixing 0.2 cc. plasma diluted with saline to one cc., 0.5 cc. broth culture, and 0.25 cc. of 0.25% calcium chloride in normal saline. The mixture was incubated at 37°C. in a water bath. The time interval between clotting and complete dissolution of the clot was recorded in hours or fractions thereof. Any clot not dissolved in 24 hours was considered to be resistant.

A preliminary study of 19 strains of streptococci on a few specimens of normal human plasma confirmed the observation that under uniform conditions, different strains of hemolytic streptococci showed marked difference in ability to produce fibrinolysin.

From the data obtained, the following deductions might be made. The variation in the fibrinolytic power of different strains of hemolytic streptococci for normal human plasma is not uniform. While a rough correlation for each strain undoubtedly exists, the fibrinolytic action of each strain of streptococcus may vary as much as from 6 to over 24 hours. Even with organisms of fairly equal activity, the susceptibility of plasma of patients with streptococcus infections is again markedly different. In 2 instances, this difference was 5 hours, while in 4 other cases, it was more than 24 hours. Moreover, this difference in susceptibility of the plasma did not correspond to the different sources from which the strains were obtained. Plasma from a patient convalescing from scarlet fever has been shown to be resistant to a streptococcus isolated from a patient with puerperal sepsis, but susceptible to some of the scarlet fever strains. In view of the existence of so much variation in streptococcus fibrinolytic activity even among such a small series, caution in interpreting the results of this test as an index of immunity to streptococcus infections is indicated.

8110 P

Protection Against Experimental Typhus Infections (Peiping Strain) with Immune Mexican Typhus Serum.

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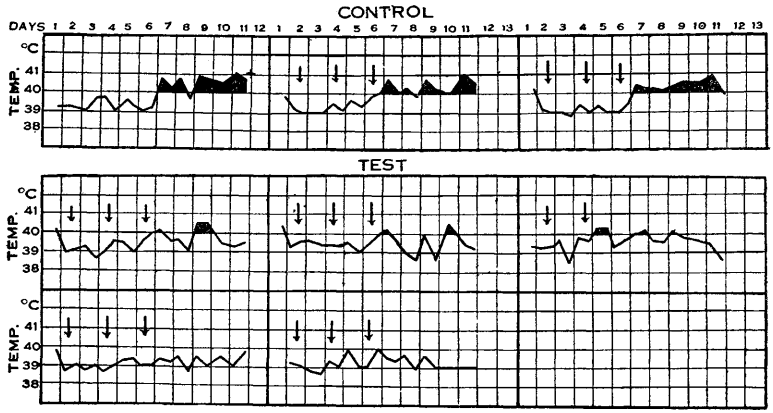
Zinsser and Castaneda[1] were able to produce an effective antityphus serum by prolonged immunization of a horse with formalin-

[1] Zinsser, H., and Ruiz Castaneda, M., *J. Exp. Med.*, 1933, **57**, 391.

ized suspensions of Mexican typhus Rickettsiae. With it they could protect guinea pigs not only against infections of Mexican typhus, but also completely against that of the European type.[2] In our study of typhus fever in North China, we have had an opportunity to examine whether or not this serum would have any definite protective action against the local strain. A brief preliminary report on this study follows:

The typhus strain used was obtained from a patient with typhus fever in Peiping. Gajdos and Chang have used it for the preparation of vaccine by the Weigl's louse intestine method in the last few years.[3] The immune horse serum was prepared in the Massachusetts State Serum Laboratory under the supervision of Zinsser and Castaneda. Male guinea pigs weighing between 300 and 400 gm. were used as experimental animals. One-fifteenth of a saline suspension of the brain of an infected guinea pig was injected intraperitoneally into a number of guinea pigs, and 24, 72, and 120 hours later, 1 cc. of immune or normal horse serum was injected subcutaneously. A control animal which received no serum was included. The body temperature was taken twice daily. The record of only one experiment is presented in the accompanying charts. The result of the other experiment was essentially the same.

The practical usefulness of the important finding of Zinsser and Castaneda is such that it needs no special comment. They offered



These charts represent the records of body temperature of 3 control and 5 test guinea pigs. Those readings that are elevated above normal are indicated by the shaded areas. The arrows show the points at which serum, normal or immune, was injected.

[2] Zinsser, H., and Ruiz Castaneda, M., *J. Exp. Med.*, 1934, **59**, 471.

[3] Gajdos, S., and Chang, J., *Chinese Med. J.*, 1933, **47**, 441.

a simple and possibly a successful method to treat and control this serious epidemic disease. Before applying this method to clinical trial here in China, we have endeavored to study its effectiveness in experimental infections. So far, the results obtained seem to indicate that with the dose employed, a significant protection has been obtained by means of this immune horse serum. The exact dosage and the possible therapeutic use of the serum after the appearance of the fever are subjects now under study.

We wish to acknowledge our indebtedness to Professor Zinsser of Harvard Medical School, Boston, for a liberal supply of immune serum, and to Dr. J. Chang of the Catholic University, Peiping, for the typhus strain used.

8111 P

Effects of Cobra Venom on the Fujinami Rat Sarcoma.

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Calmette[1] has reported that the injection of cobra venom into a mouse carcinoma brought about a very rapid disappearance of the tumor, and he suggested that cobra venom might be of value in the treatment of other tumors. Monaelesser and Taguet[2] injected cobra venom into the carcinomas of man, and they reported encouraging results.

Our experiments were performed for the purpose of determining the effect of cobra venom when injected into the Fujinami rat sarcoma. The minimum lethal dose of cobra venom for white rats, weighing from 150 to 250 gm. each, was found to be one cc. of a 1:10,000 dilution. The solutions of cobra venom used were prepared according to the following technic described by Calmette. A 10% solution of desiccated cobra venom in normal saline was prepared and heated at 72°C. for 30 minutes. The solution, including the precipitate which was formed, was then centrifuged, and the clear portion was placed in ampoules and kept as a stock solution.

Series 1. Five rats were inoculated with bits of the Fujinami rat sarcoma which reached an average size of 0.5 x 0.5 x 1 cm. in

1 Calmette, A., *C. R. de l'acad. de Sc.*, 1933, **197**, 205.

2 Monaelesser et Taguet, C., *Bul. de l'acad. de Med.*, 1933, **109**, 371.