pasture[11, 12] and his associates, and by Rivers[13] and his coworkers. Goodpasture was the first to observe that the virus of herpes simplex was capable of infecting chick membranes. We have succeeded in cultivating the herpes virus in this way through 24 generations. Ten-day chicks were used, and transfers were usually made every 4 days, small pieces of infected chick membrane serving for inoculation of succeeding generations.

The presence of and the growth of the virus was demonstrated by means of corneal inoculation in the rabbit, by histological examination of the chick membranes and by means of mice titration. For this last purpose, infected chorio-allantoic membrane was finely minced in fluid taken from the infected embryos. The liquid material thus obtained was inoculated intracerebrally into mice, undiluted and in dilutions of 1:10 and 1:100. Sterile saline was used as a diluent. The amount inoculated was never more than 0.05 cc. For 11 generations thus titrated the average survival periods were 5.5 days, and 6.5 days for the 1:10 and the 1:100 dilutions respectively, results which conform with those recorded above.

As a result of this work it may be concluded that the herpes virus, the H. F. strain of which was used, can be successfully cultivated *in vitro* and *in vivo* and that the mouse can be successfully employed as an indicator of maintained activity of the virus thus grown.

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Ineffectiveness of Certain Pentavalent Arsenicals Used Orally in T. hippicum Infected Guinea Pigs.

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Kolmer[1] has reported that "stovarsol and treparsol in doses of approximately 0.030 to 0.040 gm. per kilo of weight by oral administration for 3 to 10 days were effective in preventing trypanosomiasis of rats infected with *T. equiperdium*. Atoxyl was slightly

[11] Woodruff, A. M., and Goodpasture, E. W., *Am. J. Path.*, 1931, **7**, 209.

[12] Goodpasture, E. W., Woodruff, A. M., and Buddingh, G. J., *Science*, 1931, **74**, 371.

[13] Rivers, T. M., and Schwentker, F. F., *J. Exp. Med.*, 1932, **55**, No. 6, in press.

[1] Kolmer, J. A., with A. M. Bole, *Am. J. Trop. Med.*, 1931, **2**, 261; and *J. Pharm. and Exp. Therap.*, 1931, **43**, 521.

more effective, as doses of 0.020 to 0.030 gm. per kilo per day (orally) . . . . for 5 to 10 days prevented infection." Tryparsamide and "Bayer 205" or "Germanin" were ineffective when given orally to infected animals. He further states that when treatment was started 24 hours after infection the arsenicals were more active than when given before or at the time the infection was induced. Cooper[2] originally demonstrated this phenomenon using tryparsamide, etharsanol and "arsenoxide".

The treatment of equine trypanosomiasis *(T. hippicum)* has been unsatisfactory with the common trypanocides because horses require large amounts of expensive drugs given intravenously. Dr. Herbert Clark[3] of Panama has been partially successful with approximately 5 times the human dose of tryparsamide or "Bayer 205" combined with tartar emetic, given at weekly intervals over relatively long periods. Certain disadvantages are: first, that the cost of medication may exceed the value of the treated animal, secondly, that embolic phenomena occur with intravenous administration, thirdly, that neither prophylactic therapy nor treatment of infected animals is always successful. A more satisfactory form of therapy is needed, that is, a cheap drug that can be given by mouth without toxicity in prophylactic or therapeutic doses. Kolmer's report suggested the possibility of a successful approach to the problem from the standpoint of oral effectiveness with certain arsenical trypanocides.

Guinea pigs infected with the Panamanian strain of *T. hippicum* were treated with atoxyl, acetarsone ("stovarsol"), and carbarsone given orally. Standard intraperitoneal injections were made into normal healthy guinea pigs using 0.3 cc. of infected guinea pig blood with an equivalent amount of sterile physiological saline. The infection in the control group of untreated pigs caused death usually in one month, but a few animals survived without treatment for 6 weeks. No spontaneous cures were seen. Atoxyl was given orally in a total dose of 60 to 200 mg. per kilo in 5 divided amounts over 10 days. Acetarsone was given in the same manner in 200 to 300 mg. per kilo doses, while carbarsone was tried in 150, 250, and 300 mg. per kilo total dosage in 10 days' time. Ten animals were treated at each dose and a number of similarly infected but untreated controls were used for comparison in each group. Treatment was started 24, 48, and 72 hours after the trypanosomes had been injected intraperitoneally. The only favorable response noted was a gain in weight in the treated guinea pigs. There was no perma-

[2] Cooper, G. A., *J. Pharm. and Exp. Therap.*, 1930, **29**, 255.

[3] Clark, Herbert C., personal communication.

nent clearing of the blood stream of trypanosomes during the follow up period, and death occurred on the average in the treated group as quickly as in the untreated controls. No treated animal survived longer than 6 weeks after it became infected.

Summary. Atoxyl (in 60 to 200 mg. per kilo), acetarsone (in 200 to 300 mg. per kilo), and carbarsone (in 150, 250, and 300 mg. per kilo) were given orally without significant effect to guinea pigs experimentally infected with *T. hippicum.*

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Comparative Protective Efficiency of Some Barbitals Against the Symptoms of Anaphylactic Shock.

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It is well known that certain depressants of the central nervous system are effective in preventing fatal anaphylactic shock. Many of them, however, would not be as good protective agents against the symptoms of shock in sensitized individuals as would certain hypnotics. We have, therefore tried out the efficiency of some of the barbitals for this purpose. Three representative members of this group were selected for study: amytal, phenobarbital, and barbital. The experimental evidence here recorded supports the conclusion that phenobarbital alone possesses a highly protective efficiency against the symptoms of anaphylactic shock.

Experiments were carried out on 61 animals divided as follows: 14 controls, 10 injected with amytal, 14 with barbital, and 23 with phenobarbital. Guinea pigs weighing 250 to 300 gm. were sensitized by the intraperitoneal injection of 1 cc. horse serum. After an incubation period of 2 to 3 weeks, an intracardiac injection of a second dose of serum usually produced typical anaphylactic shock with rigid distention of the lungs in about 86% of the controls. These control observations as well as those recorded in previous communications,[1, 2] have satisfied us that the intraperitoneal route

[1] Hurwitz, S. H., and Nicholls, E. G., PROC. SOC. EXP. BIOL. AND MED., 1930, **28**, 139.

[2] Hurwitz, S. H., and Wessels, A. L., PROC. SOC. EXP. BIOL. AND MED., 1931, **29**, 120.