mosquitoes, for it has been demonstrated by guinea pig inoculation in suspensions of legs removed from uncrushed insects, as well as in suspensions of the body fluid, heads, thoraces, and abdomens. Since this virus kills horses and other mammals so readily, we might expect that a general invasion of the mosquito would likewise be fatal. This is, however, not the case, for the mortality in the cages containing infected mosquitoes is no higher than in those containing normal ones.

7708 C

Injections of Combined Paratyphoid Colon Bacillus Filtrate and Poliomyelitis Virus by Way of Gastrointestinal Tract.*

JOHN A. TOOMEY.

From the Department of Pediatrics, Western Reserve University, and the Division of Contagious Diseases, City Hospital, Cleveland, Ohio.

Poliomyelitis was produced in monkeys by injecting saline suspensions of virus into the intestine between clamps or subserosally.[1] What effect would the addition of paratyphoid colon bacillus culture filtrate have on weak suspensions of virus if introduced in the same fashion?

Monkey I was injected directly into the intestines between intestinal clamps with 40 cc. of a 2% suspension of poliomyelitis virus and 40 cc. of P. C. B.† filtrate. The first day after injection, the animal had furring and weakness of the right foot; it was very sick and obviously paretic on the 3rd day. By the 5th day, both feet were weak, the right leg showed paresis, and the extensors of the right hand were weak. It recovered and on the 17th day was active again, although it still had some paresis with beginning atrophy of the muscle groups described.

Monkey II, control for monkey I, was injected directly into the intestines between intestinal clamps with 40 cc. of a 2% suspension

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[1] Toomey, John A., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 1015.

† A number of paratyphoid colon organisms listed in a previous communication[2] were planted in glucose broth, grown for 10 days and the material passed through an N and W filter. For convenience, I will term the paratyphoid colon bacillus culture filtrate, the P. C. B. filtrate.

[2] Toomey, John A., *J. Infect. Dis.*, 1934, **54**, 74.

of virus and 40 cc. of normal physiological saline. Unlike monkey I, this animal always was active even though it had developed slight weakness of the left foot and leg on the 6th day after injection.

Monkey III was injected with 50 cc. of material. This dose was made up of 25 cc. of a 2% suspension of virus plus 25 cc. of P. C. B. filtrate injected subserosally at multiple points. Twenty-four hours after the injection the animal had some slight weakness of the muscles of both feet. In 2 days, both legs were definitely paretic and the hands were weak. In 5 days quadriplegia developed and in 8 days death occurred.

Monkey IV, control for monkey III, was injected with 25 cc. of a 2% suspension of virus plus 25 cc. of saline subserosally at multiple points. The animal remained active until the 15th day, although on the 7th day it had some paresis of the right foot. On the 15th day, it developed paresis of the left foot, leg and thigh, right foot and both hands. Although it recovered, some weakness and atrophy of the feet remained.

Monkey V was given 50 cc. of material. This dose was made up of 25 cc. of a 1% suspension of virus plus 25 cc. of P. C. B. filtrate injected subserosally at multiple points. In 24 hours, there was furring, the animal was sick and had paresis of the right foot. In 2 days, it had more obvious paresis of the right foot and thigh and left leg. In 5 days, it had paralysis of both feet and the right hand, and paresis of both legs and right thigh.

Monkey VI, control for monkey V, was given 50 cc. of material. This dose was made up of 25 cc. of a 1% suspension of virus plus 25 cc. of normal saline injected subserosally at multiple points. The animal was active at all times and never became sick or had furring, although there was some paresis of the left leg on the 7th day and weakness of the left thigh and right foot on the 15th day.

The P. C. B. filtrate, or enteric toxin, as it was previously called, was not toxic for monkeys. Three or more ounces of the filtrate was passed by stomach tube in 2 monkeys. There was no effect other than diarrhea and anorexia which lasted for 2 days. Two other animals were each injected with 15 cc. of filtrate directly into the femoral vein with no effect. An abdominal section was performed on 1 animal and 100 cc. of undiluted enteric toxin was injected through a needle directly into the small intestine. No paralysis developed. Two other animals were injected subserosally with 50 cc. of material consisting of 25 cc. of P. C. B. filtrate and 25 cc. of saline. No paresis or paralysis developed. Even the injection of

this P. C. B. filtrate directly into the nerve in the amounts mentioned caused no paralysis.[1]

Conclusion. These experiments indicate that the production of poliomyelitis is accelerated or intensified when poliomyelitis virus is combined with P. C. B. filtrate and injected subserosally or directly into the gastrointestinal tract. Two other sets of 2 animals each subsequently experimented upon in the same manner gave the same results.

7709 C

Comparative Study of Effects of Preparations of Posterior Lobe of Pituitary Gland on Water Interchange in Frogs.

FREDERIC R. STEGGERDA* AND HIRAM E. ESSEX.

From the Division of Experimental Medicine, The Mayo Clinic, Rochester, Minn.

One of us (Steggerda[1]) demonstrated that frogs given injections of pitressin absorbed considerable amounts of water in which they were kept, an increase of nearly 15% of body weight being reached in from 4 to 5 hours. Experiments in which the cloaca was tied off to prevent elimination of water and experiments similar to those described by Adolph[2] in which a comparison was made between frogs used as controls and frogs without skins led to the conclusion that pitressin has a specific effect on the permeability of the frog's skin.

With these results in mind we carried out experiments comparing the effects of solution of pituitary U.S.P. (we used pituitrin, Parke-Davis), and its separate components, pitressin, and pitocin, respectively, on the absorption of water by the frog, *Rana pipiens.* The results are here presented. We shall also report our observations on the localization of the absorbed water, and present data on the influence of pitocin on the rate of loss of water by the frog.

At the beginning of each experiment frogs weighing 40 to 50 gm. were placed in a container and nearly submerged in water at room temperature. After 30 minutes the frogs were removed, dried with gauze as uniformly as possible, and weighed on a beam balance accurate to 0.1 gm. An amount of pituitrin, pitressin, or of pitocin

*Department of Physiology, University of Illinois, Urbana, Illinois.

[1] Steggerda, F. R., *Am. J. Physiol.*, 1931, **98**, 255.

[2] Adolph, E. F., *Am. J. Physiol.*, 1931, **96**, 569.