

*aureus* were found to predominate in 14 of the 30 cases. Smears and cultures demonstrated the presence of *Corynebacterium xerosis* in a pure state in all of the spots of Bitot which occurred in 5 cases. 4. In addition to masses of Vincent's organisms, 64% of the ulcerations of the tongue, gums, or buccal mucosa yielded *Streptococcus hemolyticus*, and the remaining 36% contained hemolytic strains of *Staphylococcus aureus*. Following specific therapy with anti-pellagic substances, the bacterial flora of these ulcerations, including the Vincent's organisms, promptly disappeared.

5. A low complement titre exists in acutely deficient patients, and in the subclinical and mild cases the titre is slightly subnormal or normal. Following clinical improvement the complement titre increases. 6. In the whole blood of acutely deficient patients there is a distinct depression in the bactericidal power for *Staphylococcus aureus*, whereas, only a slight diminution in staphylococidal power was observed in the blood of subclinical and mild cases of vitamin deficiency.

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### Attempts to Produce Poliomyelitis in Eastern Cotton Rats with Flexner's M. V. Strain.\*

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Forty-five cotton rats were injected with 9 strains of poliomyelitis virus (Flexner M. V., Flexner W. E., Toomey, Philadelphia, Kramer, Harmon, Howitt, Trask, W. E., Australian). The doses injected were the same as those used by Armstrong<sup>1</sup> to produce poliomyelitis, *i. e.*, 0.06 cc intranasally, 0.06 cc intracerebrally and 0.5 cc subcutaneously of a 10% cord brain suspension. After 6 weeks of observation, 11 animals had died—2 after the injection of Harmon's and one each after the injection of the other strains, except Toomey's and Trask's. The cords and brains of those animals that died were made up into 10% suspensions in saline and injected into other animals. None of the latter either died or developed paralysis even after 4 months of observation.

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<sup>1</sup> Armstrong, C., *Public Health Rep.*, 1939, 54, 1719.

Flexner's M.V. virus strain, which was also our most potent monkey poliomyelitis virus strain and the one most recently passaged by us, was injected into 25 other cotton rats in the same manner as described before. The results were negative.

Previously, it was found that the addition of 10 day colon typhoid paratyphoid (list of organisms used,<sup>2</sup>) toxic broth filtrate (called "enteric organism filtrate" for convenience) to poliomyelitis virus accelerated the production of the disease when the combination was injected intracerebrally into monkeys.<sup>3</sup> Perhaps such a virus filtrate mixture would produce poliomyelitis in Eastern cotton rats. Ten per cent virus suspensions in enteric organism filtrate were used throughout save where otherwise noted.

Ten animals were injected with the standard dose in enteric organism filtrate in the usual way. Three animals were living after 4 months. The 2 which died of shock on the first day and 2 which died on the sixty-ninth day were discarded. One animal died the ninth, one the twelfth and one the eighteenth day after injection without developing paralysis. They merely became furred and lost weight. A suspension of the cords and brains of the latter animals in enteric organism filtrate was injected into 5 animals, only 1 of which died on the eleventh day without showing any paralysis. In turn, a suspension of its cord and brain was injected into a third generation of 5 animals, one of which died without paralysis. A suspension of its cord and brain was injected into a fourth generation of 5 animals. In an attempt to break down the resistance of these animals, they were given 4 additional subcutaneous injections of the virus-toxin combination—0.5 cc every third day. There was a marked weight loss; all 5 animals died, but none had paralysis. A combination of their cords and brains was made up for 5 animals in the fifth generation. Only the first injection was given for all of these animals died and all but one developed typical paralysis. The latter might have had paralysis for it became extremely weak and ataxic during the day. No definite assertion could be made, however, since it died during the night and was not observed. The brains and cords of these animals were combined and passaged to 3 animals of the sixth generation. All the rats developed paralysis and died. It was then decided to see if the strain had become acclimated to the rat and saline was used as the diluent for the virus suspensions injected into the 2 rats of the seventh generation. Both animals developed paralysis. The incubation period was longer, however, with saline than when enteric toxin filtrate was used as the diluent.

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<sup>2</sup> Toomey, J. A., *J. Inf. Dis.*, 1934, **54**, 74.

<sup>3</sup> Toomey, J. A., *Proc. Soc. Exp. Biol. and Med.*, 1934, **31**, 1015.

Saline diluted virus suspension of the seventh was injected into 2 animals of the eighth generation. Both developed paralysis and died. Three animals of the ninth injected with saline suspension of the eighth generation developed paralysis and died.

The virus has been passed from rat to *M. malatta* monkey in the sixth and eighth generation, respectively, and the disease produced. It has also been passed from monkey to monkey, but not as yet from monkey subpassage back to rat.

Differences are found in Eastern cotton rats that have been injected with Jungeblut's acclimated Trask virus strain,<sup>4</sup> the Armstrong and our own acclimated Flexner's M.V. strain. When saline was used as the diluent for virus suspension, the incubation period was about the same for Jungeblut's as for Armstrong's virus strain. The animals started to come down within from 3 to 4 days, becoming furred and weak at first and dying quickly—possibly from respiratory paralysis before they became completely quadriplegic. Often the animals were found dead with only a brief period between objective symptoms of furring, incoördination and death. On the other hand, it took from 6 to 7 days for the animals injected with Flexner's strain to become ill, the rats generally becoming paralyzed in the hind quarters about the sixth to the eighth day and though the paralysis spread quickly enough, it was comparatively slower than after the use of the other strains. The animals injected with Flexner's strain usually became furred after or at the same time paralysis set in, but not before.

Experiments are now in progress to determine whether other strains of virus will respond in a similar fashion.

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<sup>4</sup> Jungeblut, C., and Sanders, M., *PROC. SOC. EXP. BIOL. AND MED.*, 1940, **44**, 375.