After September 15, the fish were found to be in a normally reactive state and tests were resumed. Negative results were experienced with doses of 0.7 mg. or less. Between 0.8 and 1.2 mg. the results were always positive in 48 or 72 hours (4 experiments). With larger amounts (1.4-4 mg.) variable results were obtained, mostly negative in 48 hours, with 3 positive and 5 negative in 72 hours. The larger doses seem to have a depressing effect on the fish. They become rather sluggish and this may account for their failure to react to large doses. It is therefore evident that for crystalline synthetic androsterone a positive reaction depends on its dosage and state of suspension.

8969 C

Attempts to Infect the Common Marmoset Monkey with the Virus of Poliomyelitis.*

L. H. GROSSMAN AND S. D. KRAMER.

From the Laboratories of the Infantile Paralysis Commission of the Long Island College of Medicine.

One of the serious drawbacks in experimental poliomyelitis has been the failure consistently to transmit the disease to any animal except the Rhesus monkey. This has limited the scope of investigations of this disease. However, recent success with other viruses in lower animals, has stimulated us to continue these efforts.[1]

Other attempts have been made to infect new world monkeys, without success. Flexner and Lewis,[2] Kraus and Kantor,[3] and Jungeblut and Engle[4] failed to transmit the disease to the Cebus monkey. Mackay and Schroeder[5] failed to infect the Spider monkey.

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1 Stuart-Harris, C. H., *Brit. J. Exp. Path.*, 1936, **17**, 324; Findlay, G. M., and Clarke, L. P., *Trans. R. Soc. Trop. Med. Hyg.*, 1934, **28**, 335; Theiler, M., *Ann. Trop. Med. and Parasit.*, 1930, **24**, 249; Webster, L. T., and Fite, G. L., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 656.

2 Flexner, S., and Lewis, P. A., *J. Am. Med. Assn.*, 1910, **54**, 45.

3 Kraus, R., and Kantor, L., *Rev. d. Inst. Bact.*, 1917, **1**, 43.

4 Jungeblut, C. W., and Engle, E. T., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 879.

5 Mackay, Eaton M., and Schroeder, Charles R., PROC. SOC. EXP. BIOL. AND MED., 1935, **33**, 373.

The Marmoset was selected because of its position in the monkey family tree, being the lowest in the sub-order of anthropoids. It was felt that should successful infection take place in this monkey, further transmission to still lower animals might be more readily accomplished; this perhaps making it possible to employ with safety, as in rabies, a "fixed" living virus for active immunization of human beings.

On July 24, 1936, 2 common Marmosets were inoculated with a 10% saline suspension of active poliomyelitic cord; 0.5 cc. was administered intracerebrally into each animal and 1.1 cc. intraperitoneally. Daily temperatures were taken and the animals closely observed for any signs of illness; no alterations in temperature or behavior were noted and following the technique of Flexner,[6, 7] the animals were reinoculated one week later, August 1, 1936), with the same material, dosage and route of administration as was used in the primary inoculation. After an observation period of 9 days, in which no changes of temperature or in the health of the monkeys were noted, the animals were again inoculated (August 10) with a 20% suspension of active poliomyelitic cord (0.5 cc. intracerebrally and 2.3 cc. intraperitoneally). A control Rhesus monkey, inoculated intracerebrally with 1.2 cc. of this suspension, developed typical poliomyelitis in 7 days. The Marmosets appeared unaffected by these inoculations.

Two additional animals each received 1 cc. of a 10% suspension of active poliomyelitic cord into each nostril on 3 successive days. A control Rhesus monkey, similarly treated, developed the frank experimental disease in 5 days. The 2 Marmosets remained unaffected.

On August 10, 1936, a fifth animal was inoculated by all 3 routes with a 20% suspension of the same batch of virus. Five-tenths of a cc. was administered intracerebrally, 2.1 cc. intraperitoneally, and 1 cc. was instilled into each nostril on 3 successive days. A normal Rhesus monkey similarly treated developed poliomyelitis in 7 days. The Marmoset remained unaffected and has remained well up to the present time, a period of over 3 weeks' observation.

Two of the Marmosets were reinoculated following the technique described by Sawyer and Lloyd.[8] On September 3, 1936, both animals were inoculated intracerebrally with 0.5 of a 2% solution of boiled starch in normal saline. About one minute later the animals received 0.5 cc. of a 10% suspension of active poliomyelitic

[6] Flexner, S., *Science*, 1931, **74**, 520.

[7] Flexner, S., *Science*, 1933, **77**, 413.

[8] Sawyer, W. A., and Lloyd, Wray, *J. Exp. Med.*, 1931, **54**, 533.

cord into the same intracerebral site and 3.1 cc. of the virus suspension was inoculated intraperitoneally. Both these animals have remained unaffected up to the present time, a period of 19 days.

Summary and Conclusions. Five common Marmoset monkeys were inoculated intracerebrally, intraperitoneally, and intranasally with 10 and 20% suspensions of active poliomyelitic cord. The monkeys remained unaffected by such inoculations. The common Marmoset does not therefore appear to be susceptible to infection with the virus of poliomyelitis.

8970 P

Reduced Ascorbic Acid Content of Blood Plasma in Rheumatoid Arthritis.*

J. F. RINEHART, L. D. GREENBERG, AND F. BAKER.

From the Departments of Pathology and the Arthritis Clinic, University of California Medical School.

Experimental, clinical and other considerations led to the concept that vitamin C deficiency may operate as a contributory factor in the etiology of some cases of rheumatoid arthritis.[1]

The present study, based upon the determination of reduced ascorbic acid in the blood plasma, represents an effort to evaluate objectively the validity of this thesis. The report of Abt, Farmer and Epstein[2] and our own,[3] indicate that the method proposed by Farmer and Abt[4] is accurate and a reliable index of the intake of vitamin C in health and in any case of the immediate nutritive status with respect to the vitamin.

On the basis of excretion tests and a comparative study of diet habit and reduced ascorbic acid determinations in a group of "normal" adults,[3] we feel that fasting plasma levels below 0.7 mg. per 100 cc. are probably sub-optimal. Levels ranging between 0.7 and 0.9 mg. per 100 cc. would seem adequate. Optimal levels probably lie

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1 Rinehart, J. F., *Ann. Int. Med.*, 1935, **9**, 671.

2 Abt, A. F., Farmer, C. J., and Epstein, I. M., *J. Pediat.*, 1936, **8** 1.

3 Greenberg, L. D., Rinehart, J. F., and Phatak, N. M., PROC. SOC. EXP. BIOL. AND MED., 1936, **35**, 135.

4 Farmer, C. J., and Abt, A. F., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 1625.