The fact that no rupture has ever been observed, either in the hemispheric form on the weak points constituted by the right angles or in the bottle gourd forms at the points where the pulling action of the heavy portion of the nucleus is exerted with more intensity (Fig. 1F, arrows) shows a certain mechanical resistance.

In general the physical properties of the nuclear membranes described here are of the type found in interfaces between 2 immiscible fluids of different specific gravity and viscosity.

7513 C

Absence of Antiviral Substance in Normal Adults for the Virus of the St. Louis Encephalitis Epidemic.*

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Webster and Fite[1, 2, 3] have reported, that on the basis of serological tests, the virus isolated from the St. Louis encephalitis epidemic is not related to that of louping-ill, vesicular stomatitis, equine encephalomyelitis, acute anterior poliomyelitis, Japanese encephalitis (Type B), herpes, or chronic cases of von Economo's disease. The present work confirms and extends some of these findings.

To determine further whether or not there exists any relationship between the virus of the St. Louis epidemic and herpes virus, since there is a possible relationship between the latter virus and that of epidemic encephalitis (reviewed by report of Matheson Commission[4]) both of these viruses were studied. Since neither rabbit, guinea pigs, nor rats could be infected with the encephalitis virus and since animals actively immunized against the latter were found not immune to herpes virus, it was evident that, as far as our tests went, there was no apparent relationship between the 2 viruses.

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1 Webster, L. T., and Fite, G. L., *Science*, 1933, **78**, 463.

2 Webster, L. T., and Fite, G. L., PROC. SOC. EXP. BIOL. AND MED., 1933, **31**, 344.

3 Webster, L. T., and Fite, G. L., *Science*, 1934, **79**, 254.

4 Epidemic Encephalitis—Report of a Survey by the Matheson Commission, New York, Columbia University Press, 1929, 1932.

In the following experiments, to test a serum for antibodies, the serum was mixed with equal quantities of virus suspension of various concentrations. The mixtures were incubated at 37°C. for 1 hour during which time they were agitated frequently. Then 0.03 cc. was injected intracerebrally into mice. Simultaneous virus titrations were carried out. A serum which failed to neutralize 1-10 minimal infective doses of virus was said to be devoid of neutralizing substances.

A series of 16 cases of chronic encephalitis, of 1 to 14 years duration and all showing Parkinsonian syndrome, were tested for antibody content. One patient was a Montreal resident, the others attended the Bellevue Hospital Neurological Clinic. Nine of the group had a history of a definite acute onset. None of these serums had neutralizing substances.

As cases in the St. Louis outbreak resembled the Australian X disease in many respects, and since, as was pointed out previously,[5] Breinl isolated the virus of poliomyelitis from 2 cases of the Australian X disease, poliomyelitis antiserums were tested for encephalitis antibodies. Two human convalescent serums, a normal adult serum, a monkey convalescent serum, and the serums of both an actively immunized horse and monkey were tested. All of these serums had a high antiviral action against the virus of poliomyelitis, but none neutralized the encephalitis virus. Moreover, *Macacus rhesus* monkeys, which are highly susceptible to poliomyelitis virus, proved fairly resistant to encephalitis virus.

Since from a Japanese epidemic of encephalitis,[6, 7] a virus related to or perhaps identical with rabies virus, was isolated by Kobayashi,[6] the serums of 3 animals immunized against rabies virus and having demonstrable antibodies against the virus were tested. None of the serums neutralized the encephalitis virus.

The serums of normal individuals, 9 from St. Louis, and 68 from New York were tested. None of these people had any history of exposure to the virus. Five of the serums were from infants and the remainder from adults, whose ages ranged from 20 to 50. All of these serums failed to neutralize the encephalitis virus. Four of these serums were obtained from workers in this laboratory, 2 of whom had worked continuously with the virus. Tests were first carried out when the virus was introduced into the laboratory and retests were done some 3½ months later. The results of all the tests were negative.

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[5] Brodie, M., *Am. J. Dis. Child.*, in press.

[6] Kobayashi, A., *Japan M. World*, 1925, **5**, 145.

[7] Cowdry, E. V., *J. Exp. Med.*, 1927, **45**, 799.

That von Economo's disease and the St. Louis outbreak of encephalitis are due to different etiological agents is quite evident from these experiments and those of Webster and Fite.[2] This is further borne out in the difference in the seasonal and age incidence of the two diseases. Moreover, up to the present, no Parkinsonian-like sequellae have been reported from the 1933 outbreak in St. Louis, nor from similar cases reported in Paris, Ill., in the previous year.

Antiviral substances have been reported in the serums of recovered individuals and in those of physicians and nurses who have been in close contact with cases.[8] The fact that the serums of 9 individuals from St. Louis and 68 from New York, all without a history of contact, had no demonstrable neutralizing substance, suggest that the encephalitis antibody is specific and the result of exposure to the virus. It appears, therefore, that contact with the virus can result in either the disease or immunity, the latter being due, perhaps to reaction with the virus or a subclinical attack of the disease. In the present work there was no evidence to show that exposure to the mouse passage virus gave immunity, although the intracutaneous inoculation of virus into mice gave a high degree of immunity.‡

7514 C

Experiments with Virus of the St. Louis Epidemic of Encephalitis.*

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Workers have reported the successful transmission of a virus isolated from cases of the St. Louis epidemic of encephalitis to monkeys[1] and to monkeys and mice.[2, 3] Through Dr. Holden of the

8 Barr, David L., Meeting Amer. Coll. Physicians, Chicago, 1934.

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1 Muckenfuss, R. S., *Am. J. Pub. Health*, 1933, **23**, 1148.

2 Muckenfuss, R. S., Armstrong, C., and McCordick, H. A., *Pub. Health Rep.*, 1933, **48**, 1341.

3 Webster, L. T., and Fite, G. L., *Science*, 1933, **78**, 463.