

### Further Studies on the Virus of the 1937 Outbreak of Encephalitis in St. Louis.

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During the present summer a recurrence of epidemic encephalitis has taken place in St. Louis and St. Louis County. Clinically the disease appears similar to that seen in the same area in the summer of 1933. On September 21, 1937, we reported before the St. Louis Medical Society<sup>1</sup> the successful recovery of a strain of the virus of the present outbreak, the original inoculation being made on August 28, 1937. This had been successfully carried through 4 series of white mice. At that time the first virus neutralization test was in progress but the final report was not available. This virus has now been carried through 8 transplantations in mice. Its virulence for mice is practically identical with that of the virus of 1933. Two strains of the 1933 virus were recovered and studied by two of us in the laboratories of Firmin Desloge Hospital,<sup>2</sup> subsequent to the isolation of the virus by Webster and Fite.<sup>3</sup>

We are now able to report the completion of the 3 virus neutraliza-

TABLE I.  
Summary of Results of Virus Neutralization Tests.

Virus Dilution	Type of Inoculation			No. of Animals Inoculated	No. of Animals Surviving
1/10,000	1937	Virus	+ Normal Serum	10	None
	1937	"	+ Convalescent (1933) Serum	10	4
	1933	"	+ " (1933) "	3	None
1/100,000	1937	Virus	+ Normal Serum	10	None
	1937	"	+ Convalescent (1933) Serum	10	7
	1933	"	+ " (1933) "	15	11
1/1,000,000	1937	Virus	+ Normal Serum	10	1
	1937	"	+ Convalescent (1933) Serum	10	8
	1933	"	+ " (1933) "	12	8
1/10,000,000	1937	Virus	+ Normal Serum	10	4
	1937	"	+ Convalescent (1933) Serum	10	9
	1933	"	+ " (1933) "	6	6

<sup>1</sup> Broun, G. O., Greutter, J., Muether, R. O., and Casey, A. E., *Weekly Bull. St. Louis Med. Soc.*, 1937, **32**, 40.

<sup>2</sup> Broun, G. O., Collier, W. D., Muether, R. O., *J. Clin. Invest.*, 1934, **13**, 701.

<sup>3</sup> Webster, L. T., and Fite, G. L., *Science*, 1933, **78**, 463.

tion tests demonstrating the degree of protection afforded by the serum of 3 patients who had acute attacks of encephalitis in the summer of 1933 against the virus of the 1937 outbreak.

Virus neutralization tests were carried out on the sera of these same patients during 1935 and 1936 against the 1933 virus. These tests are included for comparison with the present tests.

The results are summarized in Table I.

The significance of these results is to indicate the identity of the virus causing the 1937 summer outbreak of encephalitis with that which caused the epidemic of 1933. It also points to the existence of an endemic focus of this infection in the St. Louis area.

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#### **Concentration of Serum Protein Following a Single Severe Hemorrhage in the Fasting Dog.**

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Numerous observations have been made on the fall in serum protein immediately following hemorrhage (particularly plasmapheresis), and its subsequent rise. According to one view, this rise is ascribed to regeneration of new serum protein, presumably from amino-acids which were absorbed from the intestinal tract or mobilized from various tissues, notably the liver and muscle. According to another view, the rise of serum protein is due to the direct entrance of protein from a "body store". This "body store" is apparently different from that contained in the various tissue fluids and lymph which furnish a ready source of fluid, but contain only 1% of protein, which is but one-seventh of its concentration in normal blood plasma.

There is general agreement regarding the fall in serum protein which follows a severe hemorrhage. Accompanied as it is by a fall in the red cell count, the process is obviously one of dilution whereby the fluid stores of the body, poor in protein, enter the blood stream in the attempt to restore blood volume back to normal. Once this dilution has occurred, further increases in serum protein concentration are presumably due to the regeneration of new protein or the direct entrance of new protein from some immediately available source, as