

currence of non-specific reaction in low dilution of serum would not seem to detract greatly from the utility of the test.

Summary. Complement fixation tests for murine typhus were performed upon the sera of 203 persons who, it is highly probable, had suffered an attack of murine typhus 7 days to 3 years and 11 months previously. The tests were positive in 85 to 88% of the cases, and in most instances the positive titers were high. Among 201 persons suspected of having had typhus, though the diagnosis was

not conclusively established, the per cent of positive reactions was less, but the titers of positive sera did not differ significantly from those of the group in which the diagnosis was considered to be established. Up to periods of 4 years after infection, mean positive titers at yearly intervals did not suggest a pronounced loss of titer with passage of time. With the exception of infrequent reactions at 1:2 dilutions in the sera of persons who had not had typhus, the test was found to be specific.

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Studies on Phosphorus-Containing Compounds in Normal and Polioencephalitic Mouse Brain.*

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Chemical investigations in the field of neurophysiology have shown that all conditions leading to a depressed nerve function are associated with a breakdown of phosphocreatine.¹ In nerve cells in which chromatolysis has been produced by axon section a markedly increased acid phosphatase activity has been found. This increased activity was proportional to the degree of chromatolysis and was probably associated with increased nucleoprotein synthesis or degradation.²

In regenerating neurons which are resistant to the infection with the poliomyelitis virus a decrease of phosphocreatine could also be shown. This change together with the reduction of cytochrome oxidase and succinic dehydrogenase activity in regenerating neurons resembled the effect of cyanide on brain

metabolism.³ Changes in the acid soluble phosphorus compounds in the brain in poliomyelitis have been described, consisting in a greatly increased content of adenosine-triphosphate and a markedly decreased content of phosphocreatine and residual organic phosphate.⁴

Experiments. In the present studies phosphorus-containing compounds were determined in normal mouse brain tissue and compared with those found in the brain of animals infected with polioencephalitis. Five weeks old mice of the C₃H strain received from the colony of Dr. John J. Bittner, University of Minnesota, were inoculated intraperitoneally with the MM poliomyelitis virus. At the height of the infection the animals were decapitated, the brain rapidly removed and homogenized in cold 5% trichloroacetic acid. Phosphorus compounds were determined by the method of Schneider⁵ which allows for

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¹ Gerard, R. W., and Waller, J., *Am. J. Physiol.*, 1929, **89**, 108.

² Bodian, D., and Mellors, R. C., *Proc. Soc. Exp. Biol. and Med.*, 1944, **55**, 243.

³ Bodian, D., and Mellors, R. C., *J. Biol. Chem.*, 1947, **167**, 655.

⁴ Kabat, H., *Science*, 1944, **99**, 63.

⁵ Schneider, W. C., *J. Biol. Chem.*, 1945, **161**, 293.

TABLE I. γ P/mg total N.

	Inorganic	Acid sol.	Lipid	Nucl. acid
Normal brain	22.4	52.8	104.0	20.4
	22.8	54.0	109.2	23.1
	22.9	56.4	105.5	22.2
	24.2	54.5	104.5	22.9
	23.0	52.0	110.0	24.1
	23.7	51.4	99.0	24.2
	24.2	54.5	120.8	38.4
	21.6	50.8	107.3	26.4
Encephalitic brain	26.2	57.5	108.2	21.6
	23.0	52.2	108.5	22.5
	26.6	52.6	107.5	25.5
	22.1	49.5	107.6	29.5
Avg normal	23.1	53.3	107.5	25.2
Avg encephal.	24.5	53.0	108.0	24.8
P*	>.562	>.562	>.562	>.562
	"Protein residue"	Ribose†	Desoxyribose‡	Total
Normal brain	9.8	9.9	7.2	187.0
	9.1	10.4	11.1	196.0
	9.9	10.7	10.8	195.0
	9.0	10.6	10.3	191.5
	11.1	10.5	10.6	197.0
	9.9	10.6	10.3	184.5
	11.1	11.5	11.2	212.0
	11.0	10.6	11.4	196.0
Encephalitic brain	10.2	8.6	11.8	198.0
	11.6	10.4	11.1	195.0
	10.4	8.2	10.5	196.0
	11.0	9.1	10.5	189.6
Avg normal	10.1	10.6	10.4	194.9
Avg encephal.	10.8	9.0	11.0	194.6
P*	.223	.005	.389	.500

* P equals probability that the difference in means as large as that observed here would be exceeded solely through operation of chance.

† Calculated from ribose as determined on nucleic acid fraction by orcinol-HCl reaction.⁵

‡ Calculated from desoxyribose as determined on nucleic acid fraction by diphenylamine reaction.⁵

the separation of phosphorus compounds into 4 groups; namely, acid soluble, lipid, nucleic acid and "protein residue". Because of the small amounts of tissue used in the study it was felt desirable to use total nitrogen as a standard reference rather than wet weight of tissue. For this reason it is not possible to compare the data presented with those of Schneider on rat brain since in Schneider's report the total nitrogen content of the tissue was not determined.

Table I shows the values of phosphorus-containing compounds in normal and infected brain tissue.

Conclusions. Determinations of phosphor-

us-containing compounds of the whole brain tissue taken from normal mice and from mice suffering from polio-encephalitis produced by the MM poliomyelitis virus did not reveal any significant differences in the inorganic, acid soluble, lipid, nucleic acid, "protein residue" or total phosphorus fractions. Nor did they show any significant differences in the desoxyribonucleic acid content as determined by the diphenylamine reaction. However, the content of ribonucleic acid as determined by the orcinol-HCl reaction was significantly reduced in infected brains as compared with normal mouse brain tissue.