

Eleven control subjects taking the same food at the same time without addition of filtrates remained well, but one reported the occurrence of food poisoning symptoms. Since this individual had been made quite ill with filtrates the previous week, the second attack may have been due to suggestion or to association with those who were ill.

The toxic substance in staphylococcus filtrates that causes food poisoning is destroyed by boiling and either destroyed or greatly weakened by heating at 60-65°C. for 30 minutes.

A second attack has been produced in one and the same individual by feeding a second portion of the same filtrate after a week's interval.

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Neutralization of the Virus of Poliomyelitis by Human Sera.*

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The investigations of Netter and Levaditi,¹ Anderson and Frost,² Peabody, Draper and Dochez,³ and of Römer⁴ among others indicate that the sera of persons who have recovered from an attack of poliomyelitis have the power to neutralize the virus of this disease. Netter and Levaditi⁵ and Taylor⁶ have shown that sera from this group of persons do not always possess this neutralizing power, however.

The work of Anderson and Frost² and of Peabody, Draper and Dochez³ and of Leake⁷ indicates that sera from suspected "abortive" cases of poliomyelitis are not certain in their action against the virus.

These 3 latter groups of observers have reported experiments in which sera of normal persons have sometimes neutralized the virus, although usually they did not.

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¹ Netter, A., and Levaditi, C., *Compt. rend. Soc. de Biol.*, 1910, lxxviii, 617.

² Anderson, J. F., and Frost, W. H., *J. Am. Med. Assn.*, 1911, lvi, 663.

³ Peabody, Draper and Dochez, 1912, *Mono. Rockefeller Institute*, No. 4.

⁴ Römer, P. H., *Epidemic Infantile Paralysis*, 1913, Eng. tr., New York.

⁵ Netter, A., and Levaditi, C., *Compt. rend. Soc. de Biol.*, 1910, lxxviii, 855.

⁶ Taylor, H. D., *J. Exp. Med.*, 1919, xxix, 99.

⁷ Leake, J. P., *Hygienic Lab. Bull.*, No. 111, 1918.

None of these investigators except Anderson and Frost,² who apparently nullified their results by the addition of "normal" human serum to activate the serum-virus mixtures, attempted to study these reactions in a quantitative manner.

In the experiments reported here Berkefeld filtrates of 5% emulsion of spinal cord containing the virus were mixed in 1.5 cc. quantities with an equal quantity of the serum dilutions studied. The resulting mixture was placed in the incubator at 37°C. for 2 hours and then in the ice box for 18 to 20 hours. Two cc. amounts of the mixture were injected into monkeys by the intra-cerebral route. The experiments were planned so that they were controlled by the presence of convalescent sera from monkeys or persons which were expected to neutralize and by sera from infants or normal monkeys not expected to inactivate.

A summary of the principal results is presented in Table I.

TABLE I.
Summary of Neutralization by Sera from the United States and Canada.

Source of Sera	Number of Sera Tested	Number of Sera Which Neutralized in Dilution		
		1:2	1:10	1:30
Persons attacked by poliomyelitis 6 mos. to 2 yrs. before test	7	4	3	2
Persons attacked by poliomyelitis 2 to 10 yrs. before test	2	2	2	2
Persons attacked by poliomyelitis 10 yrs. or more before test	3	2	1	1
Family contacts of poliomyelitis cases	4	4	4	4
Normal persons:				
Under 2 years of age	5	2	0	1†
2-11 years of age	6	5	5	5
12 years of age and over	9	8	8	6

The results indicate that sera of contacts and of normal adults and children possess at least equal and apparently more power to neutralize the virus than the sera of persons who have recovered from an attack of the disease. The sera of infants seems to be almost lacking in effect on the virus.

The results are interesting in their indication that immunization proceeds in the normal population in much the same way as in the case of diphtheria.

Re-tests of 2 of the normal adult sera tested in the ordinary dilutions used have shown that they may neutralize virus in the highest dilution yet tested, *i. e.*, 1 to 200. It is generally assumed, although so far without actual experimental proof, that there is a correlation between the neutralizing power of a serum in the *in vitro* tests and

its effectiveness in the treatment of the disease. It would seem worth while in the light of these results for the clinician to study the value of normal sera, known to neutralize virus, in the therapy of poliomyelitis. Zingher,⁸ using untested normal serum, has already demonstrated the possible usefulness of such measures.

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Further Observations on the Pregnancy-Response of the Uterus of the Cat.

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We have previously found¹ that injections of corpus-luteum extract into non-pregnant cats even after ovariectomy change the response of the uteri so that the latter, like uteri of pregnant animals, contract when the hypogastric nerves are stimulated. If such animals are untreated or receive injections of extracts containing only oestrin, their uteri always relax in response to hypogastric nerve-stimulation, thus behaving like non-pregnant uteri.

In a new series of experiments we have injected into cats and kittens sterile urine of pregnant women. The amount injected daily was approximately 10 cc.; the period of injection was about 10 to 14 days prior to a crucial experiment in which we recorded the movements of the uterus *in situ*. Such urine contains oestrin as well as another substance causing precocious sexual maturity with corpus-luteum formation and thought by some to originate in the *pars anterior* of the pituitary body.

Injected into ovariectomized cats, pregnancy-urine caused no change in uterine-response. When such injections were made into unoperated non-pregnant cats or kittens we always observed a marked follicular development, frequently with corpus-luteum formation. Only in animals the ovaries of which contained corpora lutea, did the uteri exhibit a pregnancy-response. This fact we believe constitutes further evidence that the pregnancy-response of the uterus of the cat depends at least in part on a substance elaborated by the corpus luteum.

⁸ Zingher, A., *J. Am. Med. Assn.*, 1917, lxxviii, 817.

¹ VanDyke, H. B., and Gustavson, R. G., *J. Pharm. Exp. Ther.*, 1929, xxxvii, 379.