The same solution given intravenously to guinea pigs, rabbits, cats, and dogs produced no ill effects whatever.

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Neutralization of Poliomyelitis Virus by the Serum of Native Chinese of Peiping.*

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The studies of Frost,[1] Aycock,[2] and others on the epidemiology of acute anterior poliomyelitis have led to the opinion that the virus is more widely distributed than the incidence of clinical cases indicates. Aycock and Kramer[3] found that 86% of serums from 21 normal adult persons of Atlanta, Georgia, possessed virucidal properties; these results suggest that immunity as measured by the neutralization test is extensively present in the warm southern latitudes, as other investigations have shown in the cooler northern latitudes. Recent investigations into the incidence of neutralizing serums in tropical and subtemperate regions where clinical poliomyelitis is uncommon have extended the findings of Aycock and Kramer. Hudson and Litterer[4] observed that 84% of the serums of 25 normal adults of Nashville, Tennessee, were capable of neutralizing the virus; Soule and McKinley[5] found that the serums of 8 adult Porto Ricans without history of attack or exposure to the disease were virucidal in every instance; and we[6] recently reported that 18 out of 19 serums from normal Liberian negroes were able to inactivate the virus.

To obtain data on the extent of immunity in cooler climates where the occurrence of frank cases of the disease is seldom re-

* This work was supported in large part by grants from the Milbank International Fund for the study of Infantile Paralysis.

1 Frost, W. H., *Hyg. Lab. Bull.*, No. 90, 1913, Washington, D. C.

2 Aycock, W. L., *J. Prev. Med.*, 1929, **3**, 245.

3 Aycock, W. L., and Kramer, S. D., *J. Prev. Med.*, 1930, **4**, 201.

4 Hudson, N. P., and Litterer, W., unpublished experiments.

5 Soule, M. H., and McKinley, E. B., PROC. SOC. EXP. BIOL. AND MED., 1931, **29**, 168.

6 Hudson, N. P., and Lennette, E. H., paper read before the Epidemiological Section of the American Public Health Association, Washington, D. C., October 24, 1932. To be published.

ported, we turned to the examination of the serum of native Chinese. Zia[7] writes that "among 25,000 admissions to the Peiping Union Medical College Hospital, there has been only one diagnosis of this disease," but further reports that he recently observed several cases in the acute stage. He adds that, while it is unlikely that epidemics of poliomyelitis in China have been overlooked, it does seem probable that the apparent infrequency of sporadic cases may rest on failure to recognize the manifestations of the disease.

Serum specimens for the tests were furnished us through the courtesy of Dr. W. A. Sawyer of the International Health Division of the Rockefeller Foundation. Twelve similar specimens were examined by Jungeblut,[8] who informs us that 11 neutralized the poliomyelitis virus.

The technic employed was similar to the standard procedures in use and previously described.[9] Temperatures and observations on the test monkeys were recorded daily for 6 weeks after inoculation. Ten undiluted specimens were examined for their ability to neutralize the virus. The results with 2 are indeterminate, since the test animals succumbed to infections other than poliomyelitis 17 and 22 days after injection. The 8 monkeys, inoculated with the remaining samples mixed with virus, survived without fever or other symptoms. The virus control monkey died of the experimental disease 10 days after injection; the convalescent-serum control survived without exhibiting any symptoms of infection. Histological examination of the spinal cord of the virus control monkey revealed lesions typical for experimental poliomyelitis; this evidence was lacking in the central nervous system of the animals which died of intercurrent infections.

The donors—9 males and 1 female—were native Chinese who had resided in Peiping for from 3 to 30 years, and presumably had never been outside China. The age distribution was: one each of 26, 32, 35, 36, and 37 years, three 40 years, and one each of 43 and 46 years. These serums were among those reported by Hughes and Sawyer[10] as being devoid of any power to protect mice against infection with yellow fever virus. Since the presence of yellow fever in China has been definitely excluded, the failure of the serums in mouse-protection tests was what might be expected. On the other

[7] Zia, S. H., *Nat. Med. J. China*, 1930, **16**, 135.

[8] Jungeblut, C. W., personal communication. Preliminary report in "Poliomyelitis," Williams and Wilkins, Baltimore, 1932, 440.

[9] Hudson, N. P., and Lennette, E. H., *J. Prev. Med.*, 1932, **6**, 335.

[10] Hughes, T. P., and Sawyer, W. A., *J. Am. Med. Assn.*, 1932, **99**, 978.

hand, although China is apparently free from poliomyelitis in epidemic form,[11] the high proportion of neutralizing serums occasions no surprise, inasmuch as previous contact with the specific virus cannot be ruled out. The few clinical cases of the disease reported are ample evidence that the virus is present in the population and consequently may serve to immunize it.

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A Method for the Determination of Ethyl Alcohol.*

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Ethyl alcohol is either present as such or it may be formed under certain conditions by many plant and animal cells. It is the chief product of carbohydrate metabolism of non-pathogenic as well as pathogenic yeast-like organisms.[1] Smaller quantities have been found in bacterial and mold cultures. It is found also in blood (0.001 to 0.004%) and tissues (0.0007 to 0.0026%) of animals.[2]

The usual physical methods are not applicable to the small amounts found in biological materials, and for this reason chemical methods have been proposed and used with a fair degree of success. The methods of Nicloux[3] and Widmark[4] depend upon oxidation of the alcohol by $K_2Cr_2O_7$ in the presence of strong H_2SO_4. Varying degrees of oxidation are obtained, depending upon the condition.

In the method which we propose the oxidation is carried out in 2 steps by $KMnO_4$. It is first oxidized by hot alkaline permanganate (almost quantitatively) to oxalic acid. The latter is then completely oxidized on acidification with H_2SO_4. The low final acidity permits a more accurate iodometric determination of residual oxidizing agent.

The sample, previously deproteinized, is pipetted into a 300 cc.

[11] League of Nations Monthly Epidemiological Reports, 1930, R. E. 135, 136.

* This study was aided by a grant from the Bartlett Memorial Fund of the University of Chicago.

[1] Friedemann, Theodore E., and Ritchie, Earl B., unpublished data.

[2] Gettler, A. O., Niederl, J. B., and Benedetti-Pichler, A. A., *J. Am. Chem. Soc.*, 1932, **54**, 1476.

[3] Nicloux, M., *Compt. rend. Soc. biol.*, 1931, **107**, 529.

[4] Widmark, E. M., *Biochem. Z.*, 1922, **131**, 473.