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.

6524

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.

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

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[1] Friedemann, Theodore E., and Ritchie, Earl B., unpublished data.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

Kjeldahl flask. Talcum is added, and the volume is made up to about 150 cc. Eighty to 100 cc. are distilled into another 300 cc. Kjeldahl flask containing about 50 cc. of cold water. An apparatus similar to, but somewhat larger than that recently described by Bok,[5] is satisfactory. To remove acetone and aldehydes the distillate is treated with 10 cc. of a saturated $HgSO_4$ solution in N H_2SO_4 and 5 cc. of saturated NaOH. It is then slowly distilled until about 80 cc. have been collected. The volume is diluted to the 100 cc. mark and an aliquot is analyzed.

Fifty cc. of standard $KMnO_4$ (0.1 or 0.01 N) and approximately 10 cc. of 5N NaOH are placed into an Erlenmeyer flask. This is heated 10 minutes in the boiling water bath. The flask is momentarily removed and the solution containing alcohol is run in by pipette below the surface. Heating is continued for 30 minutes. The solution is cooled. It is acidified by 10 cc. of 10 N H_2SO_4 and allowed to stand a few minutes. An excess of KI is then added and the iodine is determined by standard thiosulfate. Blank determinations are run simultaneously. The difference between the blank and the unknown represents the volume of standard $KMnO_4$ used up by the oxidation. Within the following limits, and under the conditions described above, 1 mg. is oxidized by 2.38 cc. 0.1 N $KMnO_4$ (limits 0.4 to 8 mg.). 0.1 mg. is oxidized by 2.38 cc. 0.01 N $KMnO_4$ (limits 0.04 to 0.4 mg.).

The end points are very sharp. The maximum error is about ±3%.

6525

Rate of Ammonia Liberation in Tryptic and Peptic Digestion of Casein.

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The first properly controlled quantitative study of the rate of liberation of ammonia in tryptic digestion was publised by Hunter and Smith,[1] who discussed the early literature on this phase of the subject and that need not be repeated here. They found that in tryptic digestion ammonia was liberated very slowly and that amidolysis took place very much less rapidly than peptide hydrolysis.

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[5] Bok, J. C., *J. Biol. Chem.*, 1931, **93**, 645.

[1] Hunter, A., and Smith, R. Q., *J. Biol. Chem.*, 1924, **62**, 649.