

per million of CO_2 and the bicarbonates in parts per million of CaCO_3 this equation becomes:

$$\text{H-ion Concentration} = \frac{4.0 \times 10^{-7}}{\text{HCO}_3} \text{CO}_2 + 1 \times 10^{-8}.$$

When both free carbonic acid and bicarbonates are expressed in either parts per million CO_2 or cc. CO_2 the equation becomes:

$$\text{H-ion Concentration} = \frac{3.5 \times 10^{-7}}{\text{HCO}_3} \text{CO}_2 + 1 \times 10^{-8}.$$

Preparation of ammonia-free water: G. C. BAKER. Ammonia free water may be prepared by passing distilled water through permutit. This method has advantages over other methods in (a) ease of operation and (b) production of large quantities at minimum expense. Its disadvantages are (a) gives a water of higher mineral content and (b) does not remove nitrate, nitrate or albuminoid nitrogen. Indications are that American Permutits, except the especially prepared Folin Permutit will not quantitatively remove ammonia, but the English and German Permutits seem satisfactory.

Sewage treatment at Fort Myer, Virginia: J. W. SALE and W. W. SKINNER. Sewage at Fort Myer is treated by settling, septicization, and aeration. The system cost about \$8,000, was designed for a population of 2,000 and was used a model for plants at other cantonments. A chemical and bacteriological investigation extending over a period of six days showed that the effluent was stable and sludge inoffensive. It is believed that this type of plant warrants the consideration of small towns which contemplate installing sewage disposal systems.

The nitrate content of five hundred waters which were considered safe from a bacteriological standpoint: M. STARR NICHOLS. Nichols reports the nitrate nitrogen findings of 767 ground waters which were found to be safe bacteriologically. 81.7 per cent. of the waters examined had nitrate nitrogen values of between 0 and 5 parts per million, and 56.8 per cent. gave nitrate nitrogen values of between 0 and 1.0 part per million. He cites extracts and data of other investigators and points out that his work as well as do that of other workers, show that high nitrates are not a component of normal safe waters. He cites instances which show that a well may be subject to pollution and yet not be detected by bacteriological methods. The evidence indicates, so the author believes, that the nitrate determination should be made in

addition to the bacteriological examination of every ground water and if found in greater quantities than 5 parts per million the source should be considered unsafe until a competent sanitary survey shows no possible source of pollution.

Seasonal variations of bacterial flora during filtration process: HARRY E. JORDAN. Following the operation of a water purification plant in the central states over a period of sixteen years—a series of some 50,000 examinations in a 5-year period is summarized with relation to seasonal ratios and variations by various types of organisms present. This data shows: (1) Bacterial concentration of all types studied, and the proportion of all types which are of the Coli group, is inversely proportional to the temperature. (2) Both sedimentation and filtration exercise a selective action against organisms of the Coli group and sterilization with chlorine products exercises a remarkably increased selective action against these organisms. (3) Of the total number of Coli type organisms present the fecal subtype survives purification processes—step by step—in increasingly less proportion as the temperature rises.

A study of sewage and trade wastes at Bridgeport, Conn.: W. W. SKINNER and J. W. SALE. The investigation covered a period of one year and was made in cooperation with the Bureau of Fisheries in the interests of fish and shell-fish life. Dissolved oxygen data were obtained and the composition of about twenty effluents determined. Metals and acid from copper mills and waste dyes from textile mills were the chief problems given consideration. The water in the harbor is toxic to oyster larvæ. Remedial measures are contemplated.

CHARLES L. PARSONS,
Secretary

(To be continued)

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