STANDARD METHODS OF WATER ANALYSIS

At the meeting of the Canadian Public Health Association held in Ottawa on Friday, September 28th, the committee on Standard Methods of Water Analysis reported progress. Report was adopted and the committee continued. A meeting of the committee was held the following evening and a report, a draft of which is here given, was agreed upon. This was presented at a special meeting of the Canadian section of the Society of Chemical Industry, held the following day, and a motion for its adoption was carried. Mr. Jos. Race, city bacteriologist of Ottawa, in presenting the report, briefly outlined the history of the movement and referred to the association's inception and early progress.

Draft Report of the Committee on Standard Methods of Water Analysis

That the physical, chemical and microscopical methods of analysis as published in the 1917 edition of "Standard Methods of Water Analysis" by the American Public Health Association be adopted with the following amendments:—

(*a*) All determinations of hardness by the soap method are to be made at a standard temperature of 20° C.

(*b*) That the Winkler method of estimating dissolved oxygen be tentatively adopted and that a study should be made of the method of Lancaster and Bonham, as developed in the laboratories of the Ontario Provincial Board of Health, and also that of Miller (Jour. Soc. Chem. Ind., February 28th, 1914). These methods appear to give sufficiently accurate results at a smaller expenditure of time and the Miller method also appears to be very suitable for field work.

(*c*) That the ortho tolidine method of estimating free chlorine be eliminated.

Bacteriological. — Regarding the bacteriological methods, the committee was unable to agree with many sections of the report of the American Public Health Association.

Media.—A recommendation is made that all solid media should be clarified by the addition of egg albumen in the proportion of 5 grams per litre.

Bacterial Counts.—Either agar or gelatine with incubation at 20° C. for 48 hours may be used. The committee recognizes the fact that gelatine may give a higher count than agar but is of the opinion that this advantage is generally offset by other factors that make agar more suitable for general use. Counts are also to be made on agar after 24 hours incubation at 37° C.

B. Coli.—The question of the most suitable enrichment media for the B. coli presumptive test was postponed for further consideration. In view of the absence of precise information as to the significance of the quantity of gas formed during enrichment, no final recommendation is made, but as a working basis it was agreed that all tubes showing less than 10 per cent. of gas after 48 hours should be regarded if, on shaking the tube, there is no visible evidence that gas formation is still proceeding.

Whenever practicable, all positive presumptive B. coli tests are to be plated out as soon as possible after gas formation becomes evident and the medium to be used may be litmus lactose agar, Endo's medium, or neutral red bile salt agar; the presence of typical red colonies is to be regarded as partial confirmation of the presence of some member of the B. coli group. The nature of the final confirmatory tests is postponed with a recommendation that a study should be made of the Voges and Proskauer reaction, gas production in saccharose broth, and indol formation in peptone water.

A request is also made for the investigation of plate methods for the estimation of the B. coli group.

Expression of Results.—When frequent samples are taken from the same source, only one tube of each dilution is necessary if the average number of B. coli is to be estimated by the method of Phelps (Amer. Pub. Health Assn. Rep., 33, 9) but it should be remembered that the accuracy of this method depends upon the number of variants from which the average is calculated. For individual samples several tubes of each dilution should be used and the actual results stated in the report. The most probable number of B. coli present can be calculated by the method of McCrady (Jour. Inf. Dis., 1915, 17, 183) which has recently been somewhat simplified by Wolman and Weaver (Jour. Inf. Dis., 1917, 21, 287).

ALIGNMENT DIAGRAMS FOR DETERMINING THE BENDING MOMENTS OF REINFORCED CONCRETE BEAMS*

By F. P. Watson and G. L. Wingfield

THE diagrams reproduced herewith are graphical representations of the formulæ for reinforced concrete beams given in the London County Council Regulations.

The upper diagram shows the relation between the bending moments and the working stresses of rectangular beams, and the lower, which is really a pair of separate diagrams, supplies the same information for T-beams.

In the upper diagram the three straight-line scales are drawn on the ordinary principles of a logarithmic alignment diagram, the interesting feature being the curved scale for values of $B \div b a^2$. This scale is an approximation, but the error involved is in no case more than 1 per cent. for any reading which can be taken between the left and right-hand scales.

The method of using the diagram is extremely simple. In all calculations for the designing or checking of rectangular reinforced concrete beams the values t, c, $B \div b d^2$ and r occur, two of these values being known or assumed, and the other two required. A straight line drawn through the known values on any two of the scales will intersect the other two scales at points corresponding to the two required values.

Thus if it be intended to design a beam in which the steel is stressed to 16,000 lbs. per square inch and the concrete to 600 lbs. per square inch, a straight line is drawn through these values on the t and c scales and produced through $B \div b d^2$ and the r scales. It will then be found that the percentage reinforcement is 0.675 and that $B \div b d^2$ is 95. Similarly, if the load on a given beam is such that $B \div b d^2 = 110$, and if $r \times 100 = 0.82$, the readings on the t and c scales will be 15,400 and 650 respectively.

The values of the lever arm, $1 - \frac{n}{3}$, are shown on the reverse side of the percentage reinforcement scale,

*"Engineering," London.