to the varying conditions which obtain. The proposed specification is difficult to improve upon, and seems to meet with general agreement.

2. The strength of concrete apart from any reinforcement increases as the amount of water used in mixing is decreased, this being more particularly the case during the earlier stages of the maturing of the concrete. Eventually the wetter of two mixtures will approach more nearly to the drier in strength.

3. In reinforced concrete, particularly in such portions as may contain a large amount of reinforcing bars or the like placed closely together, it is essential that the concrete should be sufficiently wet to pass between the reinforcing bars, and to thoroughly surround every portion of the steel. This should be ensured even at the expense of having the concrete wetter than would otherwise be desirable.

Where the reinforcement is not very closely spaced it is unnecessary for the concrete to be so wet.

4. Other conditions being the same, the drier the concrete the more quickly will it set and mature. This is of importance when there is any danger of green concrete being attacked by frost.

5. The wetter the concrete the greater is the tendency to contract during the process of setting and maturing. Appreciable contraction may sometimes continue for a period of several years.

6. The committee is divided as to the advisability of determining by some means of mechanical test the exact degree of "wetness" or consistency of concrete after mixing. If some scale of consistency were adopted, it would be possible to specify that concrete for any particular portion of the work should be of such and such a consistency, after mixing. This would not, of course, be at all the same as specifying that any particular amount of water should be used in mixing such concrete owing to differences of atmospheric temperature, aggregate, &c.

The advocates of the institution of some such scale of consistency are of opinion that the Concrete Institute should carry out tests on the subject.

DEFINITION OF ELASTIC LIMIT.

The Engineering Standards Committee of Great Britain gives standard definitions of the terms "yield point" and "elastic limit." The former, specified as "the point where the extension of the bar increases without increase of load," is defined as follows: "The yield point is the load per square inch at which a distinctly visible increase occurs in the distance between gauge points on the test piece, observed by using dividers or at which when the load is increased at a moderately fast rate there is a distinct drop of the testing machine lever, or, in hydraulic machines, of the gauge finger." To this is appended this note: "A steel test piece at the yield point takes rapidly a large increase of extension amounting to more than 1-200th of the gauge length. The point is strongly marked in a stress-strain diagram." The Elastic Limit is defined as "the point at which the extensions cease to be proportional to the loads. In a stress-strain diagram plotted to a large scale it is the point where the diagram ceases to be a straight line and becomes curved," and it is added that "the Elastic Limit can only be determined by the skilful use of very delicate instruments and by the measurement of the extensions for small successive increments of load. It is impossible to determine it in ordinary commercial testing." In a note added by request of the Ships Committee, it is remarked that the committee does not recommend the use of either "Yield Point" or "Elastic Limit" in the standard specifications for ship material, because in regard to the ascertainment of the Yield Point there is considerable divergence of opinion as to the best method of determining it, and all methods involve greater time and care than can be expected in the works. While it is possible in works by careful testing at a greatly reduced speed to obtain the Yield Point in ordinary mild steel and wrought iron, some of the harder steels and other constructional materials have no definite Yield Point at all, and some have no Elastic Limit. Further, it is quite impossible to determine the Elastic Limit in the time available for ordinary commercial testing. In its determination a specially delicate and accurate extensometer must be used, in the hands of a careful and competent observer, and the determination for each test bar would require a considerable time. It is properly a matter to be left to laboratories organized for scientific purposes. The Ships Committee is therefore of opinion that the present method of fixing, by experience, the working stress for any material as a proportion of the ultimate breaking stress, rather than as a proportion of the Elastic Limit or Yield Point, is the best practical method, and it considers that the inclusion in the British Standard Specifications for ship material of tests to ascertain either the Elastic Limit or the Yield Point would not justify the dislocation of the ordinary commercial testing as carried out in the works' test rooms which would thereby be entailed.

STEAM POWER PLANTS.

At the recent convention of the Coal Mining Institute of America, held in Pittsburg, December 19, there was read a paper on "Steam Power Plants," prepared jointly by O. S. Lyford, Jr., consulting engineer, and R. W. Stovel, mechanical engineer, Westinghouse, Church, Kerr Company. The paper read in part as follows:

"Owing to the diversity of fuels used in steam power plants in various sections of the country and the difficulties to be encountered in making comparisons of the values of the different fuels, we have taken Pittsburg coal with a thermal efficiency of 14,000 B.t.u. per pound as a standard for the calculations made.

"As to power plants, the ideal plant would be one that could be planned and made up in the shop, taken down and erected where it was required, but unfortunately this system of building power plants is impracticable from the fact that each plant has its peculiarities and offers different conditions to be met with so that it is very rarely that the same plans would answer for two different plants. As there are power plants for a great variety of purposes, we have, to simplify matters, considered only electric plants for railways and power stations, operated by steam turbines and where bituminous coal is used as fuel. Ten plants of this type have been selected ranging in capacity from 79,000 down to 1,000 kw., located in various parts of the country and operated under a variety of conditions."

Views were shown of foundation plans, floor plans, sectional, exterior and interior views of various plants. From the costs of constructing these plants the authors of the paper had prepared a table giving the maximum and minimum costs of each item of importance entering into the erection and equipment of the plants and the totals showed that the costs ranged from $38 to $83.75 per kw. The cost of boiler installations ranged from $23.15 to $50.25 per horse-power.

"It will be seen that the fuel to be used has been decided, the geographical location of a plant has little to do with the design or equipment, but that the location of the water supply and the method of receiving fuel are important facors; also that a proper design and proper arrangement of the apparatus have more to do with the cost of the plant than any other factor."