DISCUSSION ON BECHTEL PAPER, MINNEAPOLIS, JAN. 8, 1904.

C. H. CHALMERS:—The ordinary guarantees of regulation of generators, such as six per cent increase on pressure of non inductive and 19% on load with 80% power-factor, mean practically no regulation. A proper specification for pressure regulation should include a pressure regulator guaranteed to keep the pressure within one per cent of normal for speed variations of five per cent from normal, either way, for a variation of power-factor from unity to 75%, for variations of load from zero to 50% overload, and for changes of temperature of the generator from that of the room to 55° Centigrade above the room temperature; and this regulation should be obtained when any or all of these causes of variation exist simultaneously. There are four principal sources causing variations of pressure, as follows: variation in speed, in the load, in the power-factor of the load, and in the changes of temperature. A pressure regulator external to the generator actuated by variation in pressure alone is a perfect remedy for variations due to any or all of these sources, and moreover permits the use of the very simplest form of generator, eliminating series coils and all apparatus for compensating pressure changes.

GEORGE D. SHEPARDSON:—Automatic regulators ordinarily cause as much trouble as they are supposed to eliminate; they have usually been untrustworthy, and it is as necessary to have an attendant to watch the regulator as it would be to watch the pressure changes themselves; there is practically no saving in attendance. Moreover, as long as central stations charge for energy and not for light, there is little direct incentive to them to give the best regulation, since their income is not increased thereby. The interest of the central station man is rather to use all low efficiency lamps and the consequent sale of a greater amount of energy for a given amount of light.