

microscope indicates that it has the structure of a suspensoid. On still slower cooling pearlite is obtained and the structure recalls very strongly the phenomenon of periodic precipitation. Fig. 8 shows the Liesegang rings obtained by the precipitation of silver chromate in gelatin. These recall the appearance of pearlite in a very striking manner. We see, therefore, that colloidal chemistry gives an explanation of the reason for the peculiar laminated structure of pearlite, an explanation which will hold good for all other eutectics. It is unfortunate that the ultramicroscope does not lend itself to the study of alloys, but as pointed out earlier, other methods are available, and no doubt advantage will be taken of them in time to find out if that which at the present time is merely conjecture can be demonstrated by experiment.

## THE "THERM" SYSTEM OF CHARGING FOR GAS

SIR WILLIAM POPE

**A**S the result of a view expressed by the Fuel Research Board some years ago, the Gas Companies now sell gas by the "therm"; the consumer is thus charged at a fixed rate for each 100,000 British Thermal Units obtainable by burning the gas. Since coal gas is used as a source of energy, it seems but just that it should be sold on an energy basis, and that its cost should be fixed by reference to the amount of some form of energy, such as heat, obtainable from it; the heat unit of a therm is quite a suitable one to use.

The new method of charging for gas replaces the former one in which a charge per 1000 cubic feet was made; to charge for gas by volume, without defining its heating value, is just as reasonable as it would be to sell milk by the pint without limiting the amount of water which might be added to it before the sale. That it is more rational to charge for gas by the therm than by the 1000 cubic feet is not to be doubted. To-day, however, the daily Press—and notably the *Daily Mail*—is said to be inundated with complaints to the effect that the new mode of charging for gas has resulted in an increase in the gas bills and in an illegitimate profit to the producing companies.

Whilst entirely agreeing that to charge by the therm marks a distinct advance, I am inclined to think that the gas undertakings have made a most unfortunate choice of the time at which to make the change. The rising coal market and the heavy expense caused to the gas-making industry by the coal strike of last year greatly increased manufacturing costs. Whilst the selling price of gas is now undoubtedly falling throughout the country, it is fairly certain that in most cases the price is higher to-day than it should be; the consumer of gas, who often understands neither the volume nor the energy unit, will not be content until the

sum total of his gas bill *in money* approximates more nearly to pre-war figures.

The attempts which have been made to popularise the therm by public advertisement have probably not served their purpose because the announcements are couched in terms incomprehensible to those who have not received the rudiments of a scientific education. It has been stated recently in the literature of gas technology that modifications are now being made in the existing gas-meter register so that the gas user may read his consumption directly in therms; this will be better appreciated than long dissertations explanatory of the therm. It might even be well if, until this modified register is universally installed, gas undertakings were to indicate upon their gas bills the consumption not only in therms but also in cubic feet, so that the public could make direct comparisons with their gas accounts of previous quarters; this would obviate the need for a calculation the nature of which is not universally understood. Naturally, it should be insisted that equal prominence is given to the number of therms and of cubic feet, and to the cost of each of the two units, the therm and the 1000 cubic feet.

Gas legislation of 1920 may have been faulty in defining the methods by which standard basic prices, dividends permissible, etc. are to be fixed, but upon this aspect of the question I am not prepared to write. It is of the greatest importance, however, that the progress made by the Fuel Research Board, in instituting the sale of gas upon a heat basis, should not be prejudiced by extraneous factors; it seems highly desirable that the Board of Trade should call for an inquiry into the question for the purpose of defining the nature of those factors which have arisen fortuitously but which undoubtedly operate against the popularity of a distinct advance, that, namely, of securing by legislative action the merchandising of gas on the basis, not of its bulk, but of its usefulness to the consumer.

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In a letter to *The Times* of October 7, Sir George Beilby, Director of Research to the Fuel Research Board, explains the reasons which induced the Board, after devoting a year and a half to the study of the question, to recommend the adoption of the thermal system of evaluating coal gas. He states that there are two other matters of importance to the consumer which have not been sufficiently considered, viz., the need of a calorimeter, now available, to record continuously and automatically the heating quality of the gas, and the necessity for securing that the consumer shall burn his gas in the most economical manner. For this purpose it was recommended that the gas companies should readjust consumers' burners free of charge, whenever the calorific value of the gas was changed.