from individual weights. The group weights are as follows: Vegetable Products, 1·4; Animals and their Products, 1·0; Fibres, Textiles and Textile Products, 3·4; Wood and Wood Products, 1·3; Iron and its Products, 4·0; Non-Ferrous Metals and their Products, 1·9; Non-Metallic Minerals and their Products, 1·1; Chemicals and Allied Products, 6·5.

In an unweighted index number each group would be given adequate representation by allotting to it a definite number of commodities. For example, since vegetable products are estimated to have an importance of 28·1 p.c. in the trade of the country, this group would have 28·1 p.c. of 238 commodities, that is, it would include 67 commodities. But when weighting is introduced, the percentage must be applied to the aggregate value of all the 238 commodities in the base year, and in order to ensure the proper relationship of the ratios it was found necessary to adopt group weights.

The choice of the formula to be used in calculating index numbers has been much simplified in recent years by the work of such writers on the subject as Fisher, Knibbs and Walsh. In "The Making of Index Numbers," Professor Irving Fisher discusses the numerous mathematical formulæ which may be used for index number calculations. These are classified as good or bad according as they pass two great tests—(1) the time reversal test, which requires that the formula for calculating an index number should be such that it will give the same ratio between one point of comparison and another point, no matter which of the two is taken as the base; (2) the factor reversal test, in which the formula should be such that if a price index is made and a quantity index then made by interchanging the prices and quantities used to compute the price index, the products of the two should be the true value ratio.

A formula which does not completely satisfy these tests but which has found a great deal of favour is that known as Laspeyre's; it is expressed—

$$\frac{\Sigma P_1 Q_o}{\Sigma P_o Q_o}$$

where Σ = Sum; Q_o=Quantities or weights in the earlier year or base year; P_o=Prices in the base or earlier year; P_1=Prices in the given year to be compared with the base or earlier year.

This formula has been adopted by the Bureau in its index number computations; it is also used in the Australian index numbers, in the United States Bureau of Labour index numbers, the South African index and others, in addition to having been endorsed by the British Empire Statistical Conference in 1920.

The formula in question is known as the "aggregative" method. It is a comparison of the aggregate value of stated quantities of a set list of goods in any year, with an identical list of goods and quantities at prices which prevailed in the year chosen as the base for the comparison. The number of commodities, their quality, and the weights or quantities used remain constant; the prices change and, therefore, the total sum necessary to purchase that list of commodities will change. By dividing one sum into the other, the percentage of increase or decrease in the value of the list may be obtained and this is the index of prices. Using mathematical symbols the process may be described by saying that, in order to find the relative price of a commodity in any year as compared with the base year, the price of the commodity in the later year multiplied by the weight ($P_1 Q_o$) is divided by the price of the commodity in the base year multiplied by the same weight ($P_o Q_o$). To find the index for all commodities, each is multiplied by its weight, the products are then all added together and the total sum for the later year ($\Sigma P_1 Q_o$) is divided by the total sum for the base year ($\Sigma P_o Q_o$).