

or prices for special qualities, or for abnormal lots, or for a narrow and local market, or for a period of abnormally high or low prices. Where prices were quoted it was important, but often impossible, to ascertain what was understood by "average price"—whether it was (a) a simple arithmetical average, or (b) a mean between two extremes, or (c) an average calculated according to the quantity sold at each price, or (d) the price at which most purchases were made.

7. After the most satisfactory of the prices were collected, the next step taken was to combine them in order to compare their levels at different times. A tabulation of the actual prices collected is of little value in affording a convenient measure of the changes in these levels. For this purpose the method commonly adopted is the method of index numbers. A certain period is chosen as the standard or base period; the average prices for that period are equated to 100, and those of subsequent periods are expressed as percentages of the base or standard index number. Thus, in the English Board of Trade index number, of wholesale prices in general, the year 1900 is the base period, the general level of prices for that year is represented by 100, and the levels for 1905 and 1911 as 97·6 and 109·3 respectively, showing in the one case a slight fall and in the other a moderate rise in prices for those years as compared with 1900. In this way changes can be conveniently measured in the prices of a single commodity, a group of commodities, and, on the assumption that the prices of certain goods are representative of all prices, of commodities and services in general. For the complete success of our inquiry one essential is index numbers for the last twenty years of the retail prices in New Zealand of the commodities and services that comprise the schedule of living. Such index numbers do not exist; the materials we have been able to collect contribute very little to the data necessary for their formation, and furthermore it does not appear practicable to form such index numbers at all in the present state of statistical method, even in those countries with well-developed statistical bureaux. Nearly all the index numbers of repute in every country are index numbers of wholesale, not retail, prices, it having been found impossible as yet to frame an accurate general retail index number. The Board of Trade retail index number, which is frequently quoted, is for certain food-prices only, and is said to show semi-wholesale rather than retail prices.\* The conditions that preclude the formation of reliable and useful retail index numbers are (1) the absence of standardization of grades and of standard retail quotations for the same article over a series of years; (2) the rapid variations in the quality and the general nature of retail articles, which are powerfully influenced by changes of fashion and the varieties of production; and (3) the local and non-typical character of retail prices.

Combination  
of data.

Wherever retail prices have been observed and classified, however, they appear to change in the same directions, and at about the same times, as wholesale prices (and this is in accord with theoretical conditions), so that the use of index numbers of wholesale prices to assist in measuring changes in the cost of living may be justified on both *a priori* and practical grounds—provided, of course, that the index numbers used fairly indicate the prices of the goods actually comprising the schedule of living. The Commission has therefore availed itself largely of the data embodied in the index numbers of Sauerbeck, the Board of Trade, and the *Economist* for the United Kingdom; of Coats for Canada; of the Bureau of Labour and Bradstreet for the United States of America; of Schmitz for Germany, as well as McIlraith's Index Numbers for New Zealand; but the more reliable of the quotations of prices, both retail and wholesale, handed in by witnesses have been used to check the inferences drawn from the study of index numbers. These quotations are, however, mostly single prices, referring to a particular date, district, commodity, or grade of commodity, and the strict application of guiding principles would lead to the rejection of many of them as "primary" material for our particular purpose; but they have been found extremely useful as "secondary" material, for the purpose of checking, testing, and confirming results otherwise obtained.

8. Having ascertained and classified the changes in the prices of the items in the schedule of living over the last twenty years, it is necessary to find the relative expenditure on the various items before combining the changes into an index number

\* Bowley, Palgrave's Dict. of P.E., Appendix, p. 800.