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"Index-Numbers" and Wages-Regulation.

IF we want to study the movements of prices, whether within some more or less narrowly defined group of commodities (*e.g.* foodstuffs or textiles) or over a wider range (*e.g.* all the commoner commodities consumed in the United Kingdom), the necessity is soon felt for some means of summarising the diverse fluctuations noted. This can be readily effected by taking some particular price of each commodity as a standard (usually the price in a particular year or the average over a series of years), expressing the price of that commodity at any epoch as a percentage of the standard price—thus rendering the various movements comparable—and then averaging in some way for the whole series of commodities the *index-numbers* thus obtained. The average so calculated is usually itself termed an *index-number of prices*, with some qualifying expression to show to what it relates—*e.g.* an index-number of wholesale prices, of retail prices, or whatever it may be.

When consideration is given to the planning of such an (average) index-number, a great variety of questions at once arises. For example: (1) What commodities shall be included? (2) What sorts or qualities of each commodity? (3) What prices shall be used? Wholesale prices? Retail prices? Import values? Export values? At what markets? (4) How is the standard price for each commodity to be determined? For what reference year or reference period? (5) Finally, how are the individual index-numbers to be aver-

aged? The answers to be given on these points evidently must depend on the question that the index-number is intended to answer. Only a definite question permits of a definite answer; and two very distinct questions have dominated researches into the movements of prices: (*a*) The question of the effect of currency changes—*e.g.* the substitution of paper for gold, or the varying supplies of the precious metals. (*b*) The question of changes in the "cost of living."

Questions of the first type present their own, and numerous, difficulties; but from the point of view of practice there is one simplification, that the answer must be based on wholesale prices, quotations for which can be obtained with comparative ease. Such questions are certain to arise in a time following important new discoveries of the precious metals, as they did after the gold discoveries of 1848-49, which gave rise to two classical researches, those of William Newmarch and of Jevons.

Newmarch¹ used twenty-two quotations, no fewer than four of which were for cotton. 1845-50 was taken as the reference period. At first no summary was attempted; later the index-numbers for the individual commodities were simply added together instead of being averaged, so that the base-figure was 2200 instead of 100. Virtually, however, the index-number was the simple arithmetic mean of its components. This index-number has been given monthly in the *Economist* almost without a break since 1869, and remained on precisely the same basis until 1911. The inconvenience of the old basis had by this time become very marked—such vital commodities as foreign wheat, steel, petroleum, and rubber were not included—and the whole basis was revised. The number of quotations was raised from twenty-two to forty-four, and the base-period was altered from 1845-50 to 1901-5. When the simple arithmetic mean is used for the average the base-period is important, as it determines a virtual system of weighting.

The work of Jevons² (1863-65) is mainly of importance from his use of the geometric mean as the form of average. Without entering into the reasons that he assigned, some of which are obscure, one reason is clear and important. If the geometric mean be used, the ratio of the index-number for any year B to year A is the

¹ Cf. vols. v. and vi. of "The History of Prices," by Tooke and Newmarch; the Mercantile Reports by Newmarch in the Journal of the Royal Statistical Society, vols. xxii., xxiii., and xxiv.; and the volumes of the *Economist* from 1864. The summary figure appears to have been first given in 1869.

² Reprinted in "Investigations in Currency and Finance" (Macmillan, 1864).

same whatever year be used as base, and this is not the case if the arithmetic mean be used. Jevons's calculations were not maintained, but his work on this point of method has been fruitful.

Sauerbeck,³ having regard to the unsatisfactory character of the old *Economist* number, constructed in 1886 a fresh index, using forty-five quotations. His base-period was the eleven years 1867-77, and he again used the simple arithmetic average for his mean. The calculation of the index-number was maintained, and it has now become the index-number of the *Statist*. In some ways this number also is no longer entirely satisfactory; foreign meat, for example, is not included, nor rubber.

The Board of Trade⁴ in 1903 constructed an official index-number of wholesale prices in which a weighted arithmetic mean of the individual index-numbers was used, weights being given by the estimated values consumed. It was not a satisfactory number. The correct method of weighting does not seem to have been realised, and the weights actually used were based on a period different both from the reference year first employed (1871) and from that used later (1900), with the result that two widely divergent series of figures have been given. Very rightly the Board has decided that the old number should now be entirely dropped and a fresh index constructed on a new basis. This basis was fully described in a paper by Mr. A. W. Flux,⁵ of the Board of Trade, read before the Royal Statistical Society for discussion in January last. So many as 150 quotations are used for the new number, and the geometric mean is employed, thus freeing the results from any influence of choice of reference period, and obtaining a completely consistent series of averages. No actual weights are used, but, as in the case of the *Economist* and the *Statist* index-numbers, there will be an approximate weighting by assigning more quotations to the more important commodities. It must be noted also that this number is really devised to answer a question different from that faced by Newmarch or Jevons—the effect, not of currency on prices, but of prices on currency. In the case of dutiable commodities the duty will therefore be included in the price; prices will not be quoted duty-free as in the case of the other wholesale numbers. The number, the first figures for which

have been published in the *Board of Trade Journal*, represents a great advance.

All the above index-numbers are essentially index-numbers of wholesale prices, and deal preponderantly, though not wholly, with raw materials. Clearly this is not what is required for an index-number of "cost of living." But what do we mean by that very elastic phrase? As soon as we endeavour really to analyse the term, it becomes extraordinarily difficult to say. The clearest definition is "the cost of purchasing year by year the same schedule of commodities and services." It is nearly a century since Joseph Lowe⁶ attempted calculations on this basis for the change in "cost of living" between 1792, 1813, and 1823 for a country labourer, a town mechanic, and a middle-class family, using estimated budgets of normal expenditure as his foundation. He also suggested the voluntary regulation of wages and salaries on such a basis.

It cannot be said that we have advanced much beyond this work of a century ago so far as regards method. The Board of Trade, soon after the beginning of the war, began the publication of an index-number of retail prices in the *Labour Gazette*, afterwards maintained by the Ministry of Labour. At first it was termed an index-number of "cost of living," but, very judiciously, that phrase was afterwards dropped, and it is now referred to only as a measure of changes in retail prices. It is to be regretted that not only members of the public, but also members of the Government themselves, still, nevertheless, continue to refer to it as an index of the "cost of living." The process of calculation was fully described in the *Labour Gazette* for March, 1920. A fixed schedule of foodstuffs was taken, based on the pre-war consumption of a working-class family, and the total cost of this schedule at the prices of the day compared with the prices of July, 1914, gives an index-number for food; index-numbers for working-class rents, clothing, fuel and light, and miscellanea (ironmongery, brushware, and pottery; soap and soda; tobacco and cigarettes; fares and newspapers) are determined by other inquiries, and these several group-indexes are combined into a general average on the basis of weights determined from pre-war expenditure.

The number is thus based entirely on the conception of purchasing a fixed schedule—the maintenance of a fixed mode of life. But when prices

³ Journ. Stat. Soc., vol. xlix., 1886: subsidiary papers and annual reviews since.

⁴ Report No. 321, 1903, and later *Labour Gazette* or "Annual Abstract of Labour Statistics."

⁵ Journ. Stat. Soc., March, 1921. The paper has also been separately printed.

⁶ "The Present State of England" (London, 1822, and second edition, 1823).

change, people do not maintain their previous mode of life in absolute fixity, and in war-time they cannot do so. What, then, is to be done? The Committee⁷ appointed in March, 1918, to report on "the actual increase since June, 1914, in the cost of living to the working classes," under the chairmanship of Lord Sumner, based its number on the actual *expenditure on living*—i.e. if a working-class family of definite size spent £*x* in the earlier year, and £*y* in the later year, the index-number of "cost of living" was taken as *y/x*. However interesting such a figure⁸ may be—and it obviously has its interest—it is certainly not deserving of the title "an index-number of cost of living." To its use for regulating wages Labour leaders made the obvious objection: "If we can buy next to no food, you will say that we need have next to no wages." Had the Committee suggested (and the suggestion arises naturally out of its report) that, in the case of food, the Calorie-value of the dietary should be kept constant, this objection would have been obviated. If an index-number is to deserve the name of an index-number of cost of living at all, there must be fixity of a standard of some kind.

But the virulence of the discussion that has centred round the Ministry of Labour number is largely due to this fact, that it has been used as the basis of wages-regulation. Need a number for regulating wages (if they ought to be so regulated, which is itself a very debatable question) be a number for "cost of living"? For example, Customs and Excise duties certainly contribute to cost of living; but they are meant to be paid by those who choose to consume the dutiable commodities. Ought they, then, to be included, as duties are included in the Ministry of Labour number, in an index for regulating wages, thus merely shifting payment to the employer? Again, ought luxuries to be included? Neither tobacco nor newspapers can be called necessities. They are rightly included when it is a question of constructing an index-number of "cost of living." Ought they to be included in a number for wages-regulation, as in the Ministry of Labour number? These, and the like, are certainly questions that ought to be discussed, and if it is realised that the index-number is intended to serve the purpose of regulating wages, and not of indicating some

vaguely conceived "cost of living," it may be possible to arrive at definite and agreed answers. The revision of the Ministry of Labour number will certainly have to be considered in the near future. Any revision should be carried out with a definite conception of the real end in view. If the Ministry of Labour would extend its views so far as to have some regard to working members of the community other than those who work with their hands for a weekly wage, it might consider the formation of a number more nearly related to the expenditure of the middle classes. No index-number of prices exists which forms any adequate basis for the regulation of salaries. Both the Ministry of Labour number and various wholesale numbers have, we believe, been used, but they are not satisfactory.

It is, in fact, time that the entire question of regulating wages and salaries in accordance with price movements, its justification, the formation of index-numbers for different classes of wage-earners (skilled and unskilled labour do not have the same budget; miners who get coal free and houses free ought not to have their wages affected by movements in rents and coal prices) and of salary-earners, and the relation that should subsist between a given movement in the index and the movement in the wage or salary should be fundamentally reconsidered.

Psychology and Psychopathology.

- (1) *Instinct and the Unconscious: A Contribution to a Biological Theory of the Psycho-Neuroses.* By Dr. W. H. R. Rivers. (The Cambridge Medical Series.) Pp. viii + 252. (Cambridge: At the University Press, 1920.) 16s. net.
- (2) *Psychoanalysis: Its History, Theory, and Practice.* By André Tridon. Pp. xi + 272. (London: Kegan Paul, Trench, Trubner, and Co., Ltd., 1919.) 10s. 6d. net.

(1) **T**HE investigations and theories of Freud have exerted a profound effect upon the development of psychology. This can be seen not only in the rapidly increasing body of teaching put forth by Freud and his orthodox followers, but still more in the mass of writings now appearing which are based largely on certain of Freud's fundamental doctrines, although they are developed along lines diverging widely from those accepted by the psychoanalyst.

In this latter group Dr. Rivers's work merits special attention, because, unlike so many of that prolific harvest of psychological and psychopatho-

⁷ Cd. 8980, 1918. Cf. also Cd. 76, 1919, on "Cost of Living of Rural Workers," and the paper by Dr. A. L. Bowley on the measurement of changes in the cost of living, *Journ. Stat. Soc.*, vol. lxxxii., 1919.

⁸ Indexes of "expenditure on food" as against food prices were given for some time during the war in the *Labour Gazette*.