ECONOMIC STATISTICS FOR AUSTRALIAN ARBITRATION COURTS

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MELBOURNE UNIVERSITY PRESS
ECONOMIC SERIES, No. 3

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Melbourne University Press
Economic Series, No. 3

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EXPLANATION OF THEIR USES, CRITICISM OF EXISTING STATISTICS AND SUGGESTIONS FOR THEIR IMPROVEMENT

BY

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MELBOURNE :
MACMILLAN & CO. LTD.
in association with the
MELBOURNE UNIVERSITY PRESS
1928

PRICE:

FIVE SHILLINGS

Registered by the Postmaster-General for transmission through the post as a book

Wholly set up and printed in Australia by
Brown, Prior & Co. Pty. Ltd.
430 Little Bourke Street, Melbourne, C.1

1955

PREFACE.

The aim of this booklet is to familiarise the advocates in arbitration courts with reasonings about wages and the effect of some of the chief economic events on wages and employment and with the uses of the economic statistics which help judges in their efforts to fix wages at the level which is best for the general community. Chapter IV. is devoted to pointing out how little utility for this purpose there is in an index of the value of production per head of those engaged in industry, an index which was proposed by the Economic Commission on the Queensland Basic Wage as a general guide for arbitration courts in varying minimum wages.

Another aim is to urge advocates and judges in arbitration courts to use their influence to have the Commonwealth statistics very much improved. At present the Commonwealth Bureau of Census and Statistics is not doing the statistical work necessary for arbitration courts, even the most important part of that work. The Bureau does not collect and publish reliable statistics of unemployment in Australia. This is discussed in Chapter II., and a suggestion made there that courts should have detailed information about unemployment promptly each month. Again, there is no adequate index number of the total cost of living published for Australia, the Commonwealth official indexes being either based on unrepresentative samples of goods or compiled by faulty methods, the faults in method being due to lack of financial resources. In that lies the importance of arousing interest in these economic statistics. If the judges of arbitration courts and the advocates of employers and employed make a strong demand for elaborate and promptly published economic statistics when they are known to be useful in the work of wage fixing, then financial resources will be made available to allow more efficient methods of collection and compilation to be adopted.

I wish to thank Mr. Reading, editor of the Brisbane *Telegraph*, for permission to use an article on unemployment which appeared in the *Telegraph* of March 16th, 1927, and which is reprinted with some additions in Chapter II.

J. L. K. GIFFORD.

CONTENTS

CHAPTER I.

STANDARDS IN WAGE FIXING.

The best standard for judging whether a certain minimum wage is too high or too low is the interest of the general community. It is in the interest of the general community to have wages as high as possible without too great evil effects in the shape of unemployment and hindrance to the development of industry and trade.

A great deal has been written in vague terms about "justice" in the matter of wage fixing and about the use of such a standard by arbitration courts in fixing minimum wages. In much of the writing it has been implied that the only conflict of interest in the industrial community is between employer and employed. Some writers have assumed that a rise in wages is necessarily good for wage earners in general. They have thought only of the injury it might do to employers. Employers, they knew, were usually richer than wage earners, and sometimes very much richer, and they have written in a lofty moral tone about the duty of employers to maintain their employees in a reasonable standard of comfort and about the justice of the government making them do so. They have argued as if the idea of justice could be an exact guide in these matters.

Consequently they have often failed to notice that a big increase in real wages may be at the expense of and unjust to some wage earners who are thrown out of work as a result of the increase in wages. People who talk of justice and fairness do not always pay sufficient attention to the effects of wage changes. For example, some people would think it just that the minimum wage in Australia should be £6 per week at the present price level; that is, that real wages should be about 50% greater than they are, and that employers, in justice, should be compelled to pay it even if it reduced their profits greatly; but if the minimum wage were raised to that level one result would be a considerable increase in unemployment, which would be unjust to the people thrown out of work.

It is difficult to see why an increase in wages should be called just when it may do injustice to some people. It may be expedient to increase wages in spite of a small increase in

unemployment; it may do more good than harm; but it leads only to confused thinking to call it just. It is no more efficient a method of fixing the minimum wage to have a judge or commission decide what amount of money is necessary to provide what they think a reasonable standard of comfort and then to fix the minimum wage at that amount. Much more reasonable action can be planned if people look on the problem of wages as being the problem of finding what is the highest level of wages which industry can bear without too great evil effects in the shape of unemployment and hindrance to the development of the country's industry and trade.

There is only one such level of wages, according to each individual's idea of the general interest, for each set of economic circumstances. If the country becomes richer the most convenient level of wages may be higher, and if the country becomes poorer the most convenient level of wages may be lower. Wages should never be made higher than this level with the idea of compensating for any time when wages were lower than they might have been. For if they are set higher than this level, by definition, they will cause more harm than good at the present or in the future.

When viewed in this light it is readily seen to be a problem which cannot be solved by an employers' representative, a trade union official, a humanitarian judge or a government commission in a few moments or a few months. It is not merely a question of what ought to be done but of what can be done. It is not merely a problem in ethics or politics, it is a difficult problem in economics. There is every reason for experts in the subject to try to make their explanations as simple and clear as possible, but in spite of all efforts it happens to remain a difficult study. It is just as useless to complain about the difficulty of this study of wage fixing as to complain about the study of mathematics.

There is still room for difference of opinion about what best serves the general interest, as to what is too much unemployment, and as to what is too great a hindrance to the development of industry. But the representatives of employers and employees, as well as the judges in the arbitration courts, when they are discussing the general interest, are using the same criteria and the same statistics, whereas, when they talk about "justice," they are talking different languages. When they are considering the general interest they are all concerned in knowing as exactly as possible the number of unemployed in the country and the changes in the total number of unemployed,

and the changes in the general level of money wages and real wages. They would also agree in considering it important to have a good deal of reliable information collected to show the changes in the general prosperity of industry and trade, and if possible to enable accurate predictions of these changes to be made.

CHAPTER II.

STATISTICS OF UNEMPLOYMENT AND EMPLOYMENT.

Information about the amount of unemployment is of special interest to arbitration courts when they are considering the fixing of minimum wages, but these statistics are important for other purposes also, because it is impossible to be sure of the causes of unemployment and difficult to find remedies for it, unless we know how much unemployment there is in the different industries and how it varies in each from month to month. The Royal Commission on National Insurance presented its *Second Progress Report* (dealing with unemployment) in July, 1926. Its recommendations include a suggestion that special inquiries be made into the incidence and causes of unemployment in the various industries and also that detailed information should be regularly furnished as to the trend of unemployment.

An arbitration court has a very special interest in this information because its own activities may be a cause of unemployment. Besides causes which affect particular industries, there are a number of different causes which increase unemployment in many industries, such as a severe drought, a severe trade depression, a large increase in the basic wage and a large decrease in the basic wage in competing countries. To distinguish between the effects of these causes and the ordinary seasonal variation in unemployment, which is quite considerable in some parts of Australia, a court needs accurate and elaborate statistics. These should include *prompt monthly returns* of the *numbers unemployed because of scarcity of work*, and the unemployed should be classified according to industry because some industries experience more unemployment than others, and they experience it at different times and from different causes. A very useful classification would be according to the industrial groups in the *Production Bulletins* of the Commonwealth, including the more elaborate of the two classifications of factories. Comparisons could then be made between the unemployment returns and the production statistics. For some purposes it is useful to know the number unemployed because of sickness, accident and old age, but the most important information, by far, for arbitration courts, is the number of people who

are anxious to obtain employment but are unable to find it. This monthly return of the number unemployed because of scarcity of work forms a very valuable indicator of the general prosperity of industry, and was described in a resolution of the Second International Conference of Labour Statisticians at Geneva in April, 1925, as being the "minimum required."

The Royal Commission on National Insurance has published the *Minutes of Evidence*, which contain several discussions of the trade union unemployment returns collected and published by the Commonwealth Bureau of Census and Statistics, and their value, as an indication of the amount of unemployment in Australia and the changes in that amount, was adversely criticised, sometimes by the trade union secretaries responsible for the returns. The main objection to their use as indications of the extent of unemployment in Australia was that they were unreliable for two reasons: First, because the secretaries of many of the unions have no unemployment registers and are obliged to guess the number unemployed, and second, that it is against the interest of the unions to make correct returns, it being sometimes in the interest of some members to conceal unemployment if they are anxious to obtain an increase in wages from an arbitration court, and sometimes in their interest to exaggerate the amount of unemployment if they wish to close their books to new members or restrict the numbers of apprentices. It seems clear that if a secretary wished to supply wrong information the Census and Statistics Bureau in present circumstances would not be able to check it. Mr. Sutcliffe admitted as much in his evidence (p. 961, *Minutes of Evidence*). Nor is this tendency to unreliability the only weakness in the trade union returns. There are three other big weaknesses, not so obvious as the one noticed, by the Royal Commission, which become apparent as soon as one attempts to use them in an effort to measure the effects of the different causes of unemployment.

1. The returns are only quarterly, being for the last week in the months of February, May, August and November.

2. The industrial classification of the number unemployed is only carried out for Commonwealth totals, so that one cannot find out from published statistics the details for each State as to the amount and percentage of unemployment in the different groups of industries. Even for the Commonwealth, no information is collected about unemployment in the pastoral, agricultural, rural and horticultural industries. Further, the classification into nine groups of industries and a miscellaneous

group is not sufficiently elaborate. It would be much more useful if the more elaborate industrial classification of the *Production Bulletins* were adopted. The reason for the lack of detail seems to be that each union is unwilling to let the public know how much unemployment exists among its own members, and they supply the information to the Bureau of Census and Statistics only on condition that this information will not be allowed to leak out. If these details of the industrial classification of the unemployed trade unionists in the separate States were published one might guess sometimes the amount of unemployment in some individual unions.

3. The third weakness in the trade union unemployment returns is that the number unemployed is classified according to cause of unemployment only in the Commonwealth totals, and this information is not published for the different States. So that it is impossible to find out from published figures the number of members of these unions in any one State unemployed because of scarcity of work.

The tendency to unreliability in the trade union returns does not necessarily mean that they have no value, and as they form the only unemployment statistics for the Commonwealth at present, it is worth while to test them by comparing them with the Census results and with the unemployment statistics published by the Queensland Department of Labour in its *Annual Report on Operations Under the Unemployed Workers Insurance Act of* 1922. These latter statistics were unaccountably ignored in the *Second Progress Report of the Royal Commission on National Insurance,* although they are compiled, so far as they go, on the best existing plan for the preparation of unemployment statistics. When we make this test we find other reasons for having no confidence in the trade union returns as showing either the amount or trend of unemployment in the Commonwealth or the different States.

Let us consider first the comparison with the Census results, which was made first in *Labour Report No.* 2 of the Commonwealth Bureau of Census and Statistics (p. 18) for the years 1891, 1901 and 1911, and later for the years 1901, 1911, and 1921, by Mr. Sutcliffe in his evidence before the Royal Commission on National Insurance (*Minutes of Evidence,* p. 959). There are several points to be noticed about this comparison, points which were not discussed by the Royal Commission mentioned.

1. The 1891 and 1901 figures for the Census refer to New South Wales and Victoria only.

2. The 1891, 1901 and 1911 figures of the Census refer to male wage earners, excluding "professional occupations" (*Labour Report, No.* 2), while the 1921 figures refer to all male and female wage and salary earners.

3. The trade union percentages for 1891, 1901 and 1911 refer to the end of the year, and the Census results are for a day at the end of March or at the beginning of April, so that any resemblance for these three years is only an accident and does not support a claim that the trade union returns are representative of the state of unemployment in Australia.

4. The membership of the reporting unions was so small in 1891 (6,445), 1901 (8,710) and even in 1911 (67,971) that a comparison of their unemployment percentage with the Census one tells us nothing about the value of the trade union unemployment percentage from 1912 to 1926, in which period the membership of the reporting unions grew from 224,023 to 445,739.

In their evidence before the Commission on National Insurance the Commonwealth Statistician (p. 1018) and Mr. Sutcliffe (p. 958) argued that the trade union percentages of unemployment represented fairly well both the amount of unemployment in the country at large and the changes in that amount from time to time. Their main arguments were (1) that casual workers were excluded and also those workers who are in specially steady employment and that the effects of these exclusions roughly balanced, and (2) that the unemployment percentages obtained from Census results in 1901 (6.5%), in 1911 (4.53%) and 1921 (10.12%) agreed fairly well with the trade union results for those years, namely, 6.59% for 1901, 4.67% for 1911, and 11.4% for 1921. It has been shown above that the 1901 and 1911 comparisons are invalid because the figures refer to dates separated by nine months, and because there may be a considerable change in the amount of unemployment from the beginning of April to the end of December. Even if these were valid comparisons the whole three would not constitute a wide or thorough comparison. They would not reveal whether the seasonal variation in unemployment in the trade unions reporting was the same as the seasonal variation in total unemployment in the country.

However, in 1921 the sample of total wage earners in the Commonwealth on which the trade union percentage is based was quite a large one, being 334,155 members out of 1,502,893 entered as male and female wage and

salary earners in the 1921 Census. The number of male wage and salary earners was 1,148,132. Most of those unemployed, according to the 1921 Census, because of scarcity of employment are sure to have been wage earners. This means that the figure of total male wage and salary earners should have been about 1,200,000 and the figure of total male and female wage and salary earners about 1,570,000. Information about unemployment in a sample of 330,000 out of 1,570,000 would be very valuable if the statistics were reliable and if we knew enough about the industrial classification of the members. This 1921 comparison is in fact the only one worth examining more fully, but even it will be found not to substantiate the claim that the trade union unemployment percentage represents the amount of unemployment in the country. The trade union returns exclude those unemployed directly as a result of a strike or lock-out. Both percentages in the comparison quoted show the percentage unemployed because of lack of work, sickness, accident and all other causes except industrial disputes. Before going on to point out that the comparison is much less favourable to this claim made for the trade union returns when it is made solely on the basis of those unemployed because of scarcity of work, which is the most important consideration both for the above-mentioned Royal Commission and for all arbitration courts, this comparison may be extended to the details for the various States as follows:—

TABLE I.

Comparison of the unemployment percentage for the last week in February, 1921, *and the last week in May,* 1921, *in the trade unions reporting to the Commonwealth Bureau of Census and Statistics, with the number of wage and salary earners returned as unemployed (except as a result of industrial disputes) at the Census of* 1921 *as a percentage of the Census figure for total wage and salary earners.*

	Census, 4th April, 1921.	Trade Union Returns, 1921. February.	May.
Commonwealth	10.2	11.4	12.5
New South Wales	10.2	13.7	13.5
Victoria	8.9	8.7	9.8
Queensland	16.8	15.5	21.8
South Australia	7.6	7.9	9.1
Western Australia	9.4	8.9	8.3
Tasmania	7.5	4.8	10.3

Quite a different situation is disclosed when one compares the percentage unemployed in each case because of scarcity of work. This is shown in Table 2.

TABLE 2.

Percentage Unemployed Through Scarcity of Work.

In trade unions reporting in Commonwealth:	
1st quarter, 1921	10.4
2nd quarter, 1921	11.8
In total wage and salary earners, 1921 Census:	
Commonwealth	5.0
New South Wales	5.0
Victoria	3.7
Queensland	9.9
South Australia	3.3
Western Australia	3.7
Tasmania	3.0
In total male wage and salary earners, 1921 Census:	
Commonwealth	6.0

The Census percentages in tables 1 and 2 would all be rather smaller if to the number shown in the Census as wage and salary earners there had been added those of the unemployed who would have been wage or salary earners if they could, and if the number unemployed had been shown as a percentage of the larger figure.

One observes that the comparison is between 5% or 6% and 10.4% instead of between 10.2% and 11.4%, as in the comparison quoted. The trade union unemployment percentage for those unemployed through scarcity of work very much exaggerated the amount of unemployment due to scarcity of work.

It has been mentioned above that there is no published information about the percentage of trade unionists in the different States who are unemployed because of scarcity of work, but an estimate good enough for the present purpose may be made in the following way: The trade union percentage for the Commonwealth for the first quarter of 1921 was 10.4 when one considers unemployment due only to lack of work; this is 91% of the percentage found (11.4) when one considers all unemployment except that due directly to industrial disputes. If one reduces the trade union percentages for the States for the first quarter of 1921 in the same proportion, one can obtain estimates of the trade union percentage of unemployment due to lack of work for the different States on the assumption that unemployment in the trade unions reporting in the various States was affected in a similar way by sickness, accident and old age. The figures follow, and may be compared with the statistics for the States in Table 2, New South Wales 12.5%, Victoria 7.9%, Queensland 14.1% South Australia 7.2%, Western Australia 8.1% and Tasmania 4.4.% There is considerable exaggeration though of varying amounts in the trade union unemployment percentages for the different States in the first quarter of 1921.

The explanation of these big differences in the results of the two comparisons of the trade union and the Census unemployment statistics for 1921 is as follows: The number of unemployed in the Census report is not divided up into the three classes, wage earners, employers and those working on their own account. A number of employers and independent workers were unemployed on account of sickness, accident or old age, but it is hard to imagine any of them entering themselves on the Census cards as unemployed because of lack of work. It is only when we consider unemployment arising from scarcity of work alone in the Census figures that we obtain a proper comparison between unemployed wage and salary earners and total wage and salary earners. When we consider unemployment from all causes except industrial disputes we compare unemployment among employers, independent workers and wage and salary earners with the total number of wage and salary earners.

A more elaborate test can be made of the value of the trade union unemployment percentage by comparing the percentage for Queensland for the years 1924-5, 1925-6 and 1926-7 with the unemployment statistics already published by the Queensland Department of Labour in the 1925, 1926 and 1927 Reports of the Operations under the Unemployed Workers Insurance Act. The actual numbers registered as unemployed were not published, but a chart was given in each report on a large scale, from which the numbers unemployed could be read off with sufficient accuracy. These figures which are shown in Table 3 are of the number registered as unemployed on the last day of each month at the labour exchanges and the labour agencies. They form an excellent indication of the amount of unemployment because of the inducement to register supplied by the unemployment insurance, which covers about 150,000 individuals, of whom 75% are estimated by the Department to be males. The comparison in Table 3 is between the Department statistics of the number registered as unemployed on the last day of the month as a percentage of 150,000, and the published unemployment percentage in trade unions reporting in Queensland minus .9. To make the trade union figures comparable with the Department statistics there has been taken away from each of the trade union percentages .9 as an allowance for those trade union members unemployed on account of sickness, accident and old age. The percentage unemployed on account of these causes in the Commonwealth was .9 in 1922, .9 in 1923, 1 in 1924, .9 in 1925, and .8 in 1926 (*Labour Report*

No. 17, p. 121). It can be readily seen from Table 3 that the trade union percentage very much exaggerated at certain times the amount of unemployment due to lack of work, though at other times it fell below the percentage based on the Department statistics. From August to November, 1924, from February to May, 1925, from May to August, 1926, and from August to November, 1926, even the direction of movement of the two series was different, and in general the trade union percentage fluctuated more than the other.

TABLE 3.

Estimates of Unemployment in Queensland Due to Scarcity of Work.

	Numbers unemployed on the last day of each month (Queensland Dep. of Lab.). The figures were read from large scale charts in the 1925, 1926 and 1927 Reports of Operations under the Unemployed Workers' Insurance Act of 1922.		Percentage unemployed in Queensland in the last week of the mid-month of each quarter in the trade unions reporting, reduced by .9 as a rough allowance for the percentage unemployed on account of sickness, accident and old age.
	Actual figures.	As percentage of 150,000.	
1924—July	5,700	3.8	
August	5,500	3.7	5.3
September	5,400	3.6	
October	5,900	3.9	
November	7,000	4.7	4.9
December	6,000	4.0	
1925—January	6,700	4.5	
February	8,000	5.3	5.1
March	7,900	5.3	
April	8,000	5.3	
May	7,300	4.9	6.5
June	5,300	3.5	
July	4,700	3.1	
August	4,700	3.1	5.4
September	5,600	3.7	
October	5,600	3.7	
November	6,100	4.1	9.2
December	7,000	4.7	
1926—January	8,000	5.3	
February	9,000	6.0	12.7
March	8,900	5.9	
April	7,800	5.2	
May	6,800	4.5	4.3
June	7,000	4.7	
July	8,600	5.7	
August	6,300	4.2	8.2
September	6,500	4.3	
October	5,500	3.7	
November	7,900	5.3	5.3
December	10,800	7.2	
1927—January	12,400	8.3	
February	12,100	8.1	6.5
March	10,800	7.2	
April	9,300	6.2	
May	8,600	5.7	5.5
June	7,700	5.1	

These two comparisons in Tables 2 and 3 are enough to show that we cannot rely on the trade union unemployment percentages to indicate the amount of unemployment at any time in the Commonwealth or the various States, or even the trend of unemployment. They also support the contention that the Commonwealth and the States should set about developing unemployment statistics independent of the trade unions. In Queensland, where the operation of the Unemployed Workers Insurance Act has already made the labour exchange statistics valuable, all that is necessary is to classify the number unemployed at the end of each month according to a good industrial classification and to publish the information promptly each month instead of at the end of the year. It would entail very little extra expense to classify in this way the numbers unemployed at the end of every month of the past three financial years and publish the information, and it would be well worth while to do this because the longer the period covered by a statistical series the more valuable the information which can be drawn from it. It would be good also to separate in the statistics the insured unemployed from the uninsured.

As to the Commonwealth and the other States, it being impossible to compel the trade unions to furnish correct returns and inadvisable to try, the governments and the arbitration courts ought to try to have the information collected in some other way. Where there is no unemployment insurance scheme in operation to make the labour exchange statistics valuable there is an alternative way of obtaining some useful information about the trend of unemployment and the changes in the general prosperity of industry. This alternative is the collection of statistics of the number of persons employed in the leading factories and merchant firms, and it is at present under consideration by the statisticians of the Commonwealth and the States. It is to be hoped that this work will be carried out in a thorough way and that the arbitration courts will use their influence to have extra money provided to have the work done properly and the results published in sufficient detail. This is very much more valuable information than much that is already published by the various governments, and its collection and tabulation should not be left to the spare time of the over-worked staffs of the existing statistical offices. To collect information about the number employed in Australia in factories with 21 hands and upwards, it will be necessary to include in the survey rather over 4,100 fac-

tories employing about 329,000 hands; if factories with 11 hands and upwards were included it would mean including 7,400 factories employing about 377,000; if factories with 5 hands and over were included it would mean obtaining information from 13,800 factories employing about 421,000 hands. These round numbers are based on the number of hands employed in these groups of factories in the Commonwealth in the year 1924-5, *Production Bulletin*, No. 19. It ought to be considered worth while to collect information from 10,000 firms at least, and if no other way is possible time ought to be taken from other statistical work of the governments. But it would be a great mistake if the number of factories included were less than the 4000 or so with 21 hands and over. The Queensland Department of Labour is at present attempting to obtain information from all employers in Queensland about the number of their employees, but the Department decided not to publish the results of this investigation in 1927 on the ground that only 80% of the returns for that year had been received (1927 *Report of Operations Under the Unemployed Workers Insurance Act*, p. 5).

Care must be taken in using the crude figures of the numbers employed in a country's industries or a large sample of them before one can obtain a satisfactory index of the variation in general prosperity which would rise above normal when industry was unusually prosperous and fall below normal when industry was depressed. Suppose there is a change in the industrial structure of the country, leading to an increase in the number of large firms and a reduction in the number of small ones, then an index based only on large concerns would show a fictitious increase in prosperity. Then seasonal variations in employment must be allowed for and also the gradual growth of the numbers employed in industry and trade in countries with growing populations.

CHAPTER III.

COST OF LIVING INDEX NUMBERS.

I.

The Commonwealth Arbitration Court has been accustomed for a number of years to vary its minimum wage in accordance with what it thought to be the changes in the cost of living for wage earners' families and the other arbitration courts in Australia have been to some extent influenced by the same idea.

Arguments are brought forward in this chapter to show that it is inadvisable in the general interest to vary the minimum wage mechanically with changes in an index number purporting to measure changes in the cost of living. These arguments are not new; they have been mentioned by several writers in Australia, but they are not yet well enough recognised. They are fairly simple, and very little study is required to see their force. The actual method, however, of using a good cost of living index number in such a way as to assist an arbitration court in making its judgment is much less well known and not quite so easy to understand. It is much more difficult to find out just how much guidance the cost of living index offers to the courts. To know this one must know the economic causes of changes in the cost of living and how these economic causes affect the general prosperity of industry and the willingness of employers to pay wages. In finding this out, a court is helped by a thorough statistical examination of the movements of the index number of the cost of living, such an examination as will reveal which commodities have risen, which have fallen, and which have remained unchanged in price. Obviously if a court is to avoid occasions when it may be misled it should be able to study an accurate index of the changes in the total cost of living. This enables it to know how real wages are changing from time to time. Accurate knowledge on this point, besides doing other things, enables a court to understand better the strength of the wage earners' demands at any time. In the absence of accurate information the judgment of the court is at the mercy of bad index numbers or is affected by random observations from the personal experience of the judges or witnesses, a kind of examination which is quite incapable of forming a basis for a sound judgment on so difficult a matter as changes in the cost of living.

Let us consider briefly the chief events which make appreciable changes in the cost of living, and the changes which they produce in the general prosperity of industry and the willingness of employers to pay wages. It will be observed that the term "willingness to pay wages" has been substituted for the somewhat confusing term "capacity to pay wages." The employers as a whole may be very wealthy as a result of big profits one year or in several years, but this has no close connection with the prospects of their paying larger wages in the following year. It is not the amount of their accumulated wealth, but the prospect of making profits in the future which influences employers in their demand for labour. No matter how wealthy employers are they are not as a rule willing to pay larger wages to the usual number of employees unless industry is expected to be more profitable in the immediate future. The arbitration court judges are not concerned, in their official work, with the absolute amount of wages employers could really afford to pay to the usual number of employees, if the employers were willing to be content with smaller profits. They are concerned with the amount of wages employers can be induced to pay to a large enough number of employees.

There are, of course, seasonal changes in the price of some foods which affect the cost of living. It should hardly be necessary to say that a seasonal rise in the cost of living is no ground for increasing the basic wage. These seasonal price changes must be allowed for or else incorrect deductions may be made as to the causes in the change in the cost of living. Potatoes form a good example of a commodity which shows a very big fluctuation in price. In the seasons when they are very dear the wage earner buys less of them, and eats more bread and onions and other foods. For this reason it would be wise to exclude them from the cost of living budget or, as has been suggested by American statisticians, consider old potatoes and new potatoes different commodities. In this case new potatoes would be considered more or less of a luxury and would not be included in a wage earner's family budget, or if it were included would be considered very unimportant. Eggs might similarly be excluded from the index number. There would still be a sufficient number of foods, which do not show a large seasonal variation in price, to ensure a big enough representation of foods in the index number.

A common cause of a rise in the cost of living in Australia is a relative shortage in primary production, which increases

the price of foodstuffs. The severe drought in 1914-15 increased considerably the cost of living in this country, but lowered rather than increased the general prosperity of industry and trade. At such a time primary producers are worse off than usual; they buy fewer manufactured goods, manufacturers and merchants find the demand for their goods falling off and their profits decreasing, sometimes even the prices of their products fall, and wherever possible they seek to economise in labour by dismissing some employees until trade revives. The increase in unemployment which is one result of a severe drought is a further influence causing a falling off in the demand for goods, and helps to depress industry still more. When the rise in the cost of living is produced by a shortage of primary products it is not advisable to increase the minimum wage in proportion to the increase. It is probably better not to increase wages at all, and if the drought were severe enough it might be advisable in the general interest to lower money wages a little instead of raising them. It may be mentioned here that the food, groceries and housing (all houses) index, the index used by the Commonwealth Arbitration Court, is a specially bad guide at such a time because of the overweighting of foodstuffs in this index. Foodstuffs form a larger percentage of the smaller market basket of goods on which this index number is based (about 60%) than they would in an index of the total cost of living in which they would form only 35% to 40% of the market basket of goods. This means that a rise in the cost of foodstuffs makes the food, groceries and housing index exaggerate the rise in the cost of living during a drought.

At other times, however, there have been periods when the prices of most goods, not merely the prices of primary products, were rising, for example, 1906-07, 1911-12 and 1919-1920. These increases in general prices and in the cost of living were not at all the result of a general scarcity of goods. On the contrary, these periods were times of increasing production and lessened unemployment. The prices of finished products were rising, while some of the manufacturers' fixed costs, such as rent and interest and often wages, were not rising so quickly, so that manufacturers and merchants, at least in the early part of such periods, gained considerably increased profits. Many of them consequently were willing to pay the same number of employees increases in wages sufficient to make up for the increases in the cost of living rather than lose the opportunity to make the increased profits, and in some cases

they would have found it profitable to pay even larger increases. In such circumstances an arbitration court can increase wages in proportion to the increase in the cost of living, and possibly even a little more, because trade and industry are unusually prosperous at such times of rising prices. Conversely, when there is a considerable and rapid fall in the general price level, such as took place from 1920 to 1921, trade and industry experience almost general depression, manufacturers find the prices of their finished products falling and their profits decreasing, and they are not willing to employ the same number of men as before at the old money wages, and if wages cannot be reduced they economise in labour, and there results an increase in unemployment. Employers in a boom in trade are willing to pay not merely higher money wages to make up for the rise in the cost of living, but higher real wages than in a trade depression.

Another kind of increase in the cost of living may be mentioned. If the world demand for Australian primary products increases very much, this will lead to increases in the price of such goods even when crops are large. The primary industries will become more prosperous, the primary producers will have more money to spend, they will buy more Australian manufactures, and the secondary industries will share in the prosperity. In these circumstances, if the cost of living rises because of the rise in the price of foodstuffs or wool, the courts probably will be able to secure increased wages to balance the increase in the cost of living, and possibly even be able to enforce larger increases without increasing unemployment, and so actually raise the standard of comfort. Another period when the courts are probably able to raise real wages and the standard of comfort without increasing unemployment, is when improvements in production, either in manufactures or primary production or both, lower the cost of production of goods. Such improvements may cause a gradual fall in the cost of living, but it may not be necessary or advisable to reduce the minimum wage in proportion to the fall. Generally speaking, the arbitration courts may raise real wages with advantage when the avenues of profitable enterprise are expanding at a greater rate than the total number seeking employment, that is when the demand for labour is increasing more quickly than the supply. This raises the value of labour, and the courts can help in obtaining higher real wages without industrial strife.

II.

Many people in Australia fancy that there is only one retail prices index number compiled for this country by the Commonwealth Bureau of Census and Statistics, namely the food, groceries and housing (all houses) index. The impression is largely due to the use still made of this index by the Commonwealth Arbitration Court in varying its minimum wage. At the basic wage hearing of the Queensland Board of Trade and Arbitration on March 2nd, 1927, every one of the representatives of employers and employees seemed to think so. They all talked as if the food, groceries and housing (all houses) index were the only one, were in fact "the cost of living index number." This index number has no claim to be considered a total cost of living index number, for it is based on only about 60% of the family budget, including foods, a few groceries and housing accommodation, and the items included vary in cost in a manner which differs very much from the way in which the prices of clothing and house furnishings change. The limitations of this index were recognised by the Royal Commission on the Basic Wage of 1920, which recommended that a total cost of living index be compiled for Australia. The New Zealand "all groups" index number of retail prices represents about 86% of family expenditure, according to an investigation in that country in 1910-11, the Australian total household expenditure index rather less because train and tram fares are omitted, but in both the sample of goods is so large that it is quite reasonable to call them total cost of living index numbers. Although the purpose in the minds of the members of the Basic Wage Commission, when they recommended the compilation of a total household expenditure index for the Commonwealth, was its use in wage fixing, the Commonwealth Arbitration Court ignored the index, possibly because the members distrusted its measurements. The Court has also ignored a recent improvement in the food, groceries and housing index, which was recommended by a conference of Australian government statisticians in order to make the budget of the index number more like the wage earner's family budget. This improvement was to alter the rent constituent from the average rent of all sizes of houses to the average rent of four- and five-roomed houses. The Commonwealth Court still has the old food, groceries and housing (all houses) index specially compiled for its use and published in the *Quarterly Summary of Australian Statistics*. The judges of the court may think it

discreet to hold by tradition in this matter; possibly they consider it their main work to lessen industrial strife and think that they will cause less trouble and fewer disputes by continuing to use the old index than by opening up a discussion of the accuracy of different index numbers of retail prices as representatives of the changes in the cost of living for wage earners' families.

The third part of this chapter will be given to a criticism of the Commonwealth total household expenditure index and the food, groceries and housing index, and will show that neither is a reliable index of the total cost of living. It will be interesting, however, to point out here the rather large disagreements of the food, groceries and housing (all houses) index and the total household expenditure index. This will persuade some readers that a more thorough examination is necessary, and reconcile them to reading in Section III. the more difficult discussion of the compilation of index numbers.

A very convenient way of comparing these two index numbers is to work out estimates of the "Harvester equivalents" for certain periods by means of both indexes. The Harvester equivalent is the money wage which will buy the family standard of comfort which could be obtained for a weekly wage of 42s. per week in Melbourne in 1907. Estimates of the Harvester equivalent of varying degrees of accuracy can be made by using different retail prices index numbers. (Justice Higgins, in the Harvester case in the Commonwealth Arbitration Court in 1907, declared that a wage of 7s. per day was a reasonable wage for unskilled labourers in Melbourne at that time. This 7s. per day is generally taken to have been equivalent to a weekly wage of 42s.) In 1907 the food, groceries and housing (all houses) index for Melbourne was 875, and in the last quarter of 1914 was 1106. If we multiply the wage of 42s. per week by 1106 and divide the result by 875 we obtain £2 13s. 1d., which is not an exact measurement of the Harvester equivalent, but an estimate the accuracy of which cannot be taken for granted, but must be tested.

We have first to examine if this is a fairly close estimate. Minor criticisms can be made of the food, groceries and housing (all houses) index besides those already mentioned. These criticisms concern the vagueness of the description of the articles included. There may be appreciable improvements possible here, but there does not seem to be any special bias likely in these errors, and if that is so the errors often

balance fairly well. The food, groceries and housing indexes are accepted here as fairly good prices indexes of the commodities included. There has been no attempt to compile a total household expenditure index for the period 1907 to 1914 in Australia, so that one cannot make a thorough examination of the efficiency of the food, groceries and housing (all houses) index and of the accuracy of this estimate of the Harvester equivalent for the last quarter of 1914. But one can make certain rough tests. During the period the food, groceries and housing index rose 26%, food and groceries alone 21%, and rent (all houses) 36%. The problem is to estimate whether clothing and miscellaneous items rose in price more or less than the others. If they did not rise at all then the Harvester equivalent based on a full cost of living index number for the last quarter of 1914 would have been about £2 9s. instead of £2 13s. 1d. If they rose in price only about 10% then the Harvester equivalent would have been about £2 11s. There is no index of the retail prices of clothing and miscellaneous items for Australia, New Zealand, the United Kingdom or the United States for the period. We may obtain some hints, however, from the course of wholesale prices if we bear in mind that wholesale prices fluctuate as a rule much more than retail prices. The coal and metals index in the Melbourne wholesale prices index number rose only 6% in the period, and the jute, leather, cotton and wool group only 1%. In the United States, although food prices increased, according to the United States Bureau of Labor Statistics index of retail prices, by 25%, the wholesale prices of clothing, according to the wholesale prices index of the same bureau, fell almost 7%, and its index of the wholesale prices of house furnishings rose only 2%. In the New Zealand official index of wholesale prices the index of the group called general merchandise and crockery increased by nearly 15% from 1909 to 1914, while coal increased in price by 2% only. (The group index numbers for this New Zealand index were not published for earlier years than 1909.) In New Zealand also Horrockses' A1 calico was only 5% higher in price in 1914 than in 1907, and Crewdson's No. 2 calico was the same price in both years. (*Enquiry into Prices in New Zealand,* 1891 *to* 1919, by Malcolm Fraser, Government Statistician.) There is nothing here to suggest that clothing prices and the prices of miscellaneous items in Australia rose as much as 20%, or even that they rose at all.

One has, however, to take tariff changes into consideration, because a very big increase in the general

level of the tariff levied on such goods might cause the Australian prices of such goods to increase more in this period than the New Zealand and the United States prices. A brief consideration of the changes in the Australian tariff in 1907 and in 1910 reveals that no changes took place big enough to cause such a rise. In this comparison there have been taken for the year 1914 the preferential rates levied on goods, the produce or manufactures of the United Kingdom. In 1913 61% of the imports into Australia of the class of goods described in the Commonwealth Trade Returns as apparel, textiles and manufactured fibres, came from the United Kingdom, 63% in 1924-5, and 60% in 1925-6. Exporters from Europe and America are often willing to sell manufactured goods at less than full cost for the sake of gaining the economies of large scale production. So that it may be assumed that the prices of these imports could not be raised to a higher extent than by the increase in the tariff on the United Kingdom goods. Of course, it is highly probable that the prices of many of these goods were not raised in Australia by the full amount of the increase in the tax on United Kingdom produce.

TABLE 4.

Differences in the Level of the Commonwealth Import Duty on Certain Classes of Goods (Being Produce or Manufactures of the United Kingdom) in 1907 *and* 1914.

Class of goods.	Differences in the level of the tariff in 1907 and 1914.	Highest limit of possible price increase resulting from this change.
Apparel	From 25% to 35%	8%
Piece goods, cotton, ordinarily used for human apparel ..	From 5% to zero	
Piece goods, woollen, heavier fabrics for men's apparel .	From 15% to 25%	9%
Cotton socks and stockings ..	From 10% to zero	
Woollen socks and stockings	From 15% to 20%	4%
Household drapery and napery	No change	
Blankets	From 15% to 25%	9%
Hats, caps, and bonnets ..	No change	
Gloves	Some no change; some from 20% to 10%	
Floor coverings	From 15% to 10%	
Boots and shoes	No change	

From this examination and from consideration of the movements of index numbers of the wholesale prices of some similar goods in two other gold standard countries one gets the impression that it is unlikely that the prices of clothing and miscellaneous items in Australia from 1907 to 1914 rose more than about 20%, and that they possibly rose less. It is unfor-

tunate that one can only obtain a general impression on such an important point. We may conclude, after a survey of the meagre evidence available that in the period 1907 to 1914 the food, groceries and housing (all houses) index provides a fairly good measure of the total change in the total cost of living. Even if the prices of clothing and miscellaneous items rose only 10% instead of 21% the effect of excluding them from the index number would be to exaggerate the rise in the total cost of living by only about 4%.

If one assumes £2 13s 1d. to be the Harvester equivalent for Melbourne in the last quarter of 1914 and also in the month of November of that year, one can make estimates of the Harvester equivalents for later periods and for the other capital cities by means of these two index numbers. Table 5 shows Harvester equivalent estimates by means of them for the six capital cities in the second quarter of 1926. A description of the method of estimating the Harvester equivalent by means of the Commonwealth total household expenditure index is given on p. 55, *Labour Report*, No. 14.

TABLE 5.

Estimates of the Harvester Equivalent for the Second Quarter of 1926 *and the Actual Federal Basic Wage at the End of* 1926 *in the Six Capital Cities of the Commonwealth. It is Shown Later that Both the Index Numbers Used May Err Considerably at Times.*

	Estimate of the Harvester equivalent, based on the food, groceries and housing (all houses) index.	Actual Federal Basic Wage, end of 1926.	Estimate of the Harvester equivalent, based on the total household expenditure (4 and 5 rooms) index.
	£ s. d.	£ s. d.	£ s. d.
Sydney	4 9 8	4 12 6	4 2 3
Melbourne	4 9 0	4 12 0	4 0 7
Brisbane	3 19 0	4 2 0	3 15 0
Adelaide	4 6 4	4 9 6	4 3 4
Perth	4 0 11	4 4 0	3 19 10
Hobart	4 6 2	4 9 0	4 2 2

The interesting contradiction shown here is that one index, the food, groceries and housing one, suggests that the cost of living on the Harvester standard was 2s. 8d. higher in Melbourne than in Adelaide, while the other suggests that it was 2s. 9d. higher in Adelaide than in Melbourne. The former suggests also that the cost of living on this standard was 2s. 10d. higher in Melbourne than in Hobart, while the latter suggests that it was 1s. 7d. higher in Hobart. The Federal basic wage was actually made 2s. 6d. higher in Melbourne than in Adelaide

under the impression that it took only £4 9s. 6d. in Adelaide to buy what could be bought for £4 12s. in Melbourne, but the other index number suggests that it required £4 15s. in Adelaide. The explanation of the contradiction in regard to the cost of living in Melbourne and in Adelaide is that the index of the prices of food and groceries was 5.7% higher in Adelaide than in Melbourne, the retail clothing index 12% higher, and the miscellaneous index 3.6% higher. The only group in the food, groceries and housing index which was higher for Melbourne than for Adelaide is rent. It is specially the rent of houses with more than five rooms which was higher in Melbourne than in Adelaide. If one takes the food, groceries and housing (4 and 5 rooms) index one finds that this index suggests that the cost of living was practically the same in the two cities, the Adelaide index being 1618 and the Melbourne index 1615. The indexes for the cities as published are all on the same base and can be compared directly.

One can find more of these contradictions between the readings of the two index numbers, but a few more examples will suffice to show that index numbers of price changes are not foolproof instruments, but require to be handled by persons familiar with their method of compilation. In the second quarter of 1926 the food, groceries and housing (all houses) index suggested that the cost of living was 14% less in Bathurst than in Melbourne, but the total household expenditure index suggested that it was only 3% less. The former index suggested that the cost of living in Goulburn was 3% less than in Melbourne, but the total household expenditure index suggested that it was 4% higher. The former index suggested that the cost of living in Geraldton, W.A., was 12% less than in Melbourne, yet the total household expenditure index suggested that it was just as high in Geraldton. These statements can be readily tested by a reference to the *Quarterly Summary of Australian Statistics*, March, 1927. It will be observed that in every instance in Table 5 the Harvester equivalent, based on the total household expenditure index, is lower than that based on the other index and that for Melbourne there is actually a difference of 8s. 5d. between the equivalents. This cannot be assumed to show that the cost of living had risen much less from 1914 to 1926 than the food, groceries and housing (all houses) index suggests. It cannot be assumed that it required only £4 0s. 11d. in Melbourne in the second quarter of 1926 to obtain the same family standard of comfort as could be obtained in Melbourne in 1907 for a weekly wage of 42s. Before one can decide which index is bet-

ter than the other, and whether both underestimate the increase in the cost of living from 1914 to 1926, one must examine the way in which the Commonwealth Bureau of Census and Statistics compiles the indexes of the retail prices of clothing and miscellaneous items of household expenditure. Reasons are given in Section III. of this chapter for believing that they are not reliable.

Some people are likely to be interested in learning what money wage is required at the present time to buy the standard of comfort which the Royal Commission on the Basic Wage of 1920 considered to be reasonable. Yet when people look to the retail prices index numbers published by the Commonwealth, they find divergent estimates. The index number used by the Commonwealth Arbitration Court for varying its minimum wage suggests that the average price level in the six capital cities in Australia fell only 4% from the fourth quarter of 1920 to the fourth quarter of 1926, the indexes respectively being 1817 and 1771. The total household expenditure index suggests that the average price level fell 14%, which makes a very great difference in estimating the money wage in the last quarter of 1926, which was equivalent to the wage considered by the Commission to be reasonable in November, 1920. An illustration for one city, Sydney, will make this point clear. On p. 37, *Labour Report,* No. 17, there is given an estimate according to the total household expenditure index (4 and 5 rooms) of the equivalent in the different capital cities in the fourth quarter of 1926, of the wage declared reasonable by the Basic Wage Commission. The table gives a wage of £5 1s. 6d. for Sydney in the last quarter of 1926 as equivalent in purchasing power to the Commission's finding of £5 17s. 1d. for November, 1920. But if one uses the index number which the Commonwealth Arbitration Court still follows, one gets £5 13s. 10d. as the wage equivalent for Sydney in the last quarter of 1926, a difference of 12s. 4d.

III.

To obtain price quotations for the retail clothing prices index and for the index of the retail prices of miscellaneous items of household expenditure the Commonwealth Bureau of Census and Statistics sends out a number of forms, one for the prices of gas and electric light and power, one for the prices of coal, coke and firewood, one for household utensils, one for household drapery, one each for the prices of a number of

clothing items for a man, a woman, a boy (10½ years), a girl (7 years) and a boy (3½ years), and one for the prices of boots for the same persons. On all except the first two the Bureau asks the retailers to fill in the price of a number of articles of "fair average quality." It is impossible to obtain agreement as to what is a woman's dress of fair average quality or of a pair of boots of fair average quality. The forms in any one firm are made up by different persons at different times, and their opinions about fair average quality may differ. If they are guided by the kind of goods most commonly sold they will not be very well guided because the fashions and qualities change considerably, and such commodities are unsuitable for an index number meant to show changes in the price level. If people, as a result of a rise in prices, are forced to economise in clothing and household utensils and furniture they may begin to buy cheaper grades, and if retailers fill in the prices of these cheaper grades the index number will tend on that account to underestimate the rise in the cost of living. This is one thing which seems to have happened during the war and the immediate post-war period. Conversely, if real wages increase and people buy goods of better quality the index number may underestimate the fall in the cost of these items. Again, if women begin wearing lighter materials which wear out more quickly the price of the most commonly sold woman's dress may show a fall at a time when the cost of clothing may even be increasing. It is not sufficient, in making an index number of prices, to take the prices of the predominant grade sold. A reliable index number can only be made when goods of practically similar quality are selected. When any one commodity selected for the index shows an appreciable change in quality it should be discarded and replaced by another which happens not to be varying in quality at that time and for which overlapping quotations can be secured.

The objections do not seem to hold quite so strongly at first sight against the price quotations used by the Commonwealth Bureau of Statistics for the years 1914 to 1920, because the retailers were asked to quote for the same quality of goods from 1914 to 1920. But their actual price quotations do not seem to have been as good as the instructions. For these years the Bureau used price quotations for clothing and miscellaneous items collected by the Basic Wage Commission in 1920. In Melbourne the traders who furnished price quotations for the articles in the Indicator List in November, 1920, were asked to quote prices for the specimen articles for

November of each of the years 1914 to 1920 (p. 100, *Supplementary Report*). The articles were before the Melbourne traders when they quoted their prices, but in many instances it would be impossible to find an article of the same quality being sold in 1914, and in those instances there may have been a good deal of guess work. They may have felt there was nothing better to do than to estimate prices for fair average quality items. Even in well-known standard lines there were appreciable reductions in quality during the war period, and it is only in these lines as a rule that the traders themselves have confidence in making price comparisons over a period with such violent price fluctuation. The traders in some cases may have trusted to their catalogues, in which case their judgments would be liable to considerable margins of error. Price quotations for clothing and miscellaneous items for the other cities for the period 1914 to 1919 were obtained by postal inquiry from the other capital cities. Forms were sent to the retailers, who had supplied quotations for November, 1920, for the articles in the Indicator List. On these forms were entered the prices which these traders had quoted for the specimen articles when the Commission had visited the cities, and the traders were asked to enter the prices at which those articles would have been sold in November of the years 1914 to 1919 (p. 101, *Supplementary Report*). If a smaller number of articles of practically unvarying quality and size had been chosen for the index number, and the same traders asked to quote prices for the years 1914 to 1919 for these articles, the index would have told a different story.

These considerations should be enough to make us distrust these index numbers, but they are not enough to give us even the slightest idea of the size of the error they may introduce into the total household expenditure index number. The clothing index for the six capital cities for 1926 was only 31% and the miscellaneous index only 32% above the level of November, 1914. Most people who have had experience of buying in Australia in 1914 and the present—the writer, unfortunately for this examination, is not one of them—would surmise that these indexes underestimated the rise in the cost of the items represented by them, but without the elaborate examination required for making an index number they could not be sure whether prices had increased 40% or 60%. The writer in trying to obtain price quotations in Brisbane for a few articles which have remained practically unchanged in quality since 1914, was hindered because the operations of the

price fixing department of the Board of Trade and Arbitration have made the wholesalers reluctant to give information about wholesale prices because they are afraid of offending the retailers. Many of the wholesalers can supply price quotations without trouble for a number of standard articles for 1914 and intervening years (the retailers do not keep records of prices in a convenient form), and it should not be difficult for the Commonwealth Bureau of Statistics to compile even now a fair index number of the wholesale prices of clothing from 1914 to the present. The writer was able, however, to obtain quotations for 1914 and 1927 for a few commodities which were practically the same in quality in both periods. Tobralco shirts, the writer was assured, were made of inferior quality during the war, but the quality has improved since.

TABLE 6.

	1914.	July, 1927.	Per cent. incr.
Horrockses' A1 calico, 36 in., price at mill in Manchester, per yd.	4⅛d.	9¼d.	110
S.S.S. galatea, price at mill in Manchester, per yd.	7¾d.	15½d.	100
Ipswich flannel (for pyjamas), retail price, Brisbane, per yd. ..	1s. 9d.	2s. 6d.-2s. 11d.	43%-67%
Men's Tobralco shirts, retail prices, Brisbane	6s. 6d.	12s. 6d.	92%
Men's all wool socks, 166, retail prices, Brisbane	1s. 6d.-1s. 9d.	4s. 6d.	157%-200%

Some boots seem to be no dearer in price, for example, blucher boots. One particular kind of blucher boot sold for 13s. 6d. by Allan and Stark, Brisbane, according to its June, 1926, country catalogue was of better quality than a blucher boot sold in 1914 for 12s. (1914 catalogue). On the other hand, some other kinds of boots seemed from the catalogues of 1914 and 1926 to be sold in 1926 at prices about 50% above the 1914 level, but it is difficult to obtain even a fair general impression as to the movements in the prices of boots and shoes.

One other way of making a rough test of the reliability of the clothing and miscellaneous indexes is to compare their movements from 1914 to the present with the movements of comparable indexes in other gold standard countries. Apart from the influence of tariff changes, prices of these goods in New Zealand, United States, United Kingdom and Canada from

1925-27 were likely to be just about as high above the 1914 level as their prices in Australia. The clothing index (which includes footwear in all the indexes to be considered) in New Zealand, United States and the United Kingdom, and the miscellaneous index in New Zealand and the United States are compiled on a better plan. In all these instances attempts are made to have the retailers quote for the same quality of article. For the New Zealand and the United Kingdom indexes the authorities print two columns on the forms sent out, in one of which is inserted the previous quotation as a guide to the retailer in quoting for the same quality. The United States Bureau of Labor Statistics does not trust to this, but sends round agents to four retailers in a number of cities and to five in New York; the agents have the duty of seeing that the price of the same quality is quoted each time. A full description of the items in the United States clothing and miscellaneous indexes has not yet been published in the *Monthly Labor Review* or in an annual bulletin on retail prices, but the items in the New Zealand indexes were given in the May, 1924, issue of the *New Zealand Monthly Abstract of Statistics*. Although we find a number of articles in the New Zealand index with descriptions which are still too vague, like a man's suit, hat and coat, boots of medium quality and others, there are quite a number which are described much more exactly, and some standard items which are practically unchanged in quality, such as Horrockses' A1 calico, Findlay's F.T. sheeting, 80-inch Viyella and Horrockses' flannelette, F.T.1. And there are no items of women's made up overwear except gloves, but the prices only of four kinds of piece goods. If the retailers take an interest in making their returns accurately, and use the earlier quotations as a guide, the error introduced by leaving some of the items rather vague may not be large. This point should be investigated, however, by the department concerned when any important decision rests on a judgment concerning the changes in the cost of living. The method of compiling the Australian index is the market basket or family budget method, but the New Zealand method is different. In compiling the New Zealand index the average price change is calculated of the different sub-groups by means of a simple average of the price changes of the different commodities, although an attempt is made to weight the articles in accordance with their importance in consumption by selecting certain goods to represent groups of commodities. An average is then calculated for the whole clothing group with the sub-groups roughly weighted in accordance with

their importance. This facilitates the discarding of commodities which cease to be important or change considerably in quality.

A description of the items in the British Ministry of Labour index of the retail prices of clothing appeared in several of the Ministry of Labour Gazettes, including February and April, 1921, and August, 1926. From this index as from the New Zealand index such specially uncertain items as women's dresses and hats are omitted. The prices of 30 articles are collected from about 500 retailers in Britain and arranged in the following six groups, the group index numbers for which are combined in an arithmetic average with the weights shown. In compiling the group index numbers the average percentage changes for the articles in each group are combined in a simple arithmetic average except in group (1), where allowance is made for the difference in importance of ready-made and bespoke suits and overcoats.

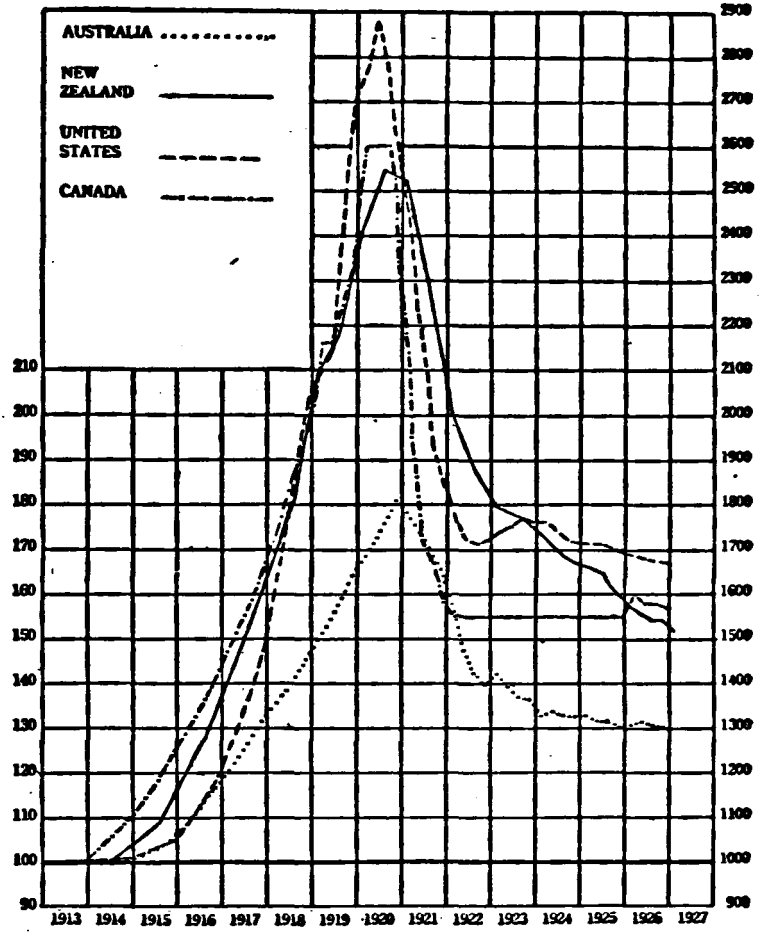
(1) Men's suits and overcoats	weight 1½
(2) Woollen material for women's outer garments	weight 1
(3) Woollen underclothing and hosiery	weight 1
(4) Cotton material for women's outer garments ..	weight ½
(5) Cotton underclothing material and hosiery	weight 1
(6) Boots	weight 1

Before the general average is compiled the indexes of groups (2) and (4) are combined with an estimate of the cost of making up in an arithmetic average in which the index of the cost of materials is given a weight of 3 and the index of the cost of making up a weight of 1. In arriving at the weights allowance was made for the fact that much of the clothing is made up at home. At 31st July, 1926, it was found that the cost of making up was nearly one and half as much as in 1914. The device adopted by the British Ministry of Labour to prevent the index number being disturbed by some retailers ceasing to quote is to find the percentage change for each price quotation supplied by each retailer and then average the percentage changes shown by the retailers for each commodity. The New Zealand and Australian practice is to average the actual prices quoted by the different retailers in one city, and that average price is used either for computing the price change, as in the New Zealand index, or in making up the cost of the market basket of goods, as in the Australian index. In the Australian index, if a retailer ceases to quote at a time when there is no change in the other price quotations his last entry is inserted, but when any of the other price quotations change his entry is omitted. (Information supplied through the Queensland Registrar-General.)

In Canada the Department of Labour has collected since 1920 price quotations for a "number of stable lines of clothing, including footwear," and also the prices of "household supplies, furniture, furnishings, etc.," and an "estimate has been made of the percentage changes in the cost of miscellaneous

CHART 1.

GRAPHS OF THE INDEXES OF TABLE 7.



items, the information thus gathered showing that such changes are approximately equal to the average changes in other items." (Canada *Year Book*, 1925, p. 749.)

In Table 7 the indexes of the retail prices of clothing are shown for the five countries, and in Chart 1 are shown the indexes for all except Britain, the index for which went so much higher than all the other indexes that it cannot be shown conveniently on a small chart along with the others. It will

be observed from the chart that the movements of the United States, the New Zealand and the Canadian indexes show considerable resemblance, especially in 1919, 1920 and 1926, and throughout the period they all show larger increases over the pre-war level than the Australian index, except the United States index in 1915 and 1916 and the Canadian one at the end of 1921 and the beginning of 1922.

TABLE 7.

Index Numbers of the Retail Prices of Clothing (Including Footwear).

	Australia. Commonwealth Bur. of Census and Statistics. Aver.* for the six capital cities in Nov., 1914 = 1000. (1)	New Zealand. Census and Statistics Office. Aver. of four centres, July, 1914 = 1000. (2)	United States. Bur. of Labour Statistics. 1913 = 100. (3)	Canada. Dominion Bur. of Statistics. Dec., 1913 = 100. (4)	United Kingdom. Ministry of Labour. July, 1914 = 100. (5)
1913			100	Dec. 100	
1914	Nov. 1000	July 1000	Dec. 101	Dec. 110	July 100
1915	Nov. 1050	Aug. 1091	Dec. 105	Dec. 125	July 125
1916	Nov. 1168	Aug. 1279	Dec. 120	Dec. 143	July 155
1917	Nov. 1315	Aug. 1529	Dec. 149	Dec. 167	July 200
1918	Nov. 1454	Aug. 1816	Dec. 205	Dec. 198	July 310
1919		Feb. 2090		Mar. 216	
		Aug. 2184	June 215	June 216	July 360
	Nov. 1641		Dec. 269	Dec. 234	
1920		Feb. 2413		Mar. 260	Feb. 400
			June 288	June 260	May 425
		Aug. 2548		Sep. 260	Aug. 430
	Nov. 1810		Dec. 259	Dec. 235	Nov. 420
1921		Feb. 2522		Mar. 195	Feb. 355
			May 223	June 173	May 310
		Aug. 2288	Sep. 192	Sep. 167	Aug. 280
	Nov. 1658		Dec. 184	Dec. 158	Nov. 260
1922		Feb. 2002	Mar. 176	Mar. 155	Feb. 250
	May 1475		June 172	June 155	May 240
	Aug. 1421	Aug. 1882	Sep. 171	Sep. 155	Aug. 240
	Nov. 1395		Dec. 172	Dec. 155	Nov. 230
1923	1st qr. 1421	Feb. 1799	Mar. 174	Mar. 155	Feb. 225
	2nd qr. 1392		June 175	June 155	May 225
	3rd qr. 1370	Aug. 1773	Sep. 177	Sep. 155	Aug. 220
	4th qr. 1363		Dec. 176	Dec. 155	Nov. 220
1924	1st qr. 1326	Feb. 1733	Mar. 176	Mar. 155	Feb. 223
	2nd qr. 1339		June 174	June 155	May 225
	3rd qr. 1329	Aug. 1687	Sep. 172	Sep. 155	Aug. 225
	4th qr. 1327		Dec. 171	Dec. 155	Nov. 223
1925	1st qr. 1328	Jan. 1664		Mar. 155	Feb. 230
	2nd qr. 1314		June 171	June 155	May 230
	3rd qr. 1311	July 1646		Sep. 156	Aug. 228
	4th qr. 1300	Nov. 1599	Dec. 169	Dec. 156	Nov. 228
1926	1st qr. 1309	Feb. 1573		Mar. 160	Feb. 225
	2nd qr. 1313	May 1555	June 168	June 158	May 223
	3rd qr. 1306	Aug. 1541		Sep. 158	Aug. 220
	4th qr. 1303	Nov. 1541	Dec. 167	Dec. 157	Nov. 218
1927		Feb. 1519			Feb. 215

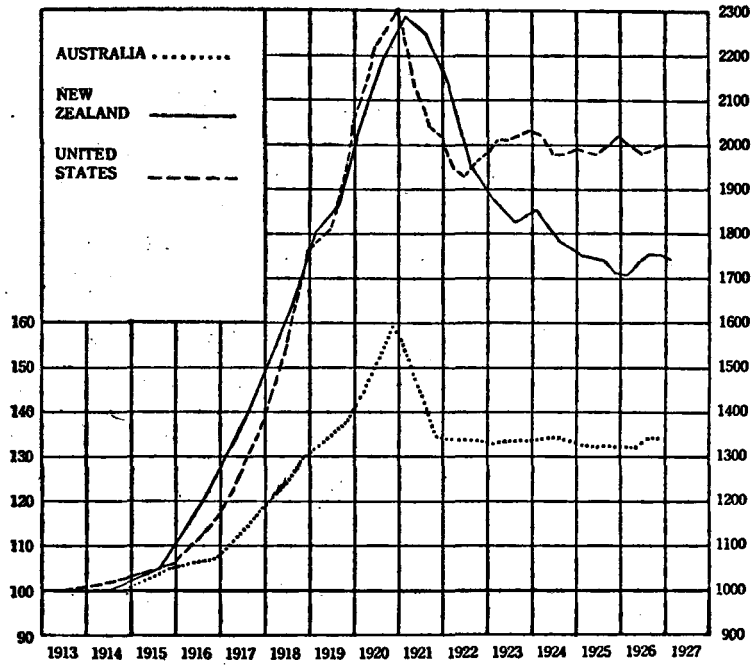
*For a description of this average see the note to Table 1, Appendix A.

Sources: Australia, Annual Labour Reports. New Zealand, Monthly Abstract of Statistics. United States, Monthly Labour Review, Feb., 1927. Canada, Year Books and U.S. Monthly Labour Review, Feb., 1927. United Kingdom, U.S. Monthly Labour Review, Feb., 1927, for figures up to 1919, and British Ministry of Labour "Gazette" for later figures.

Chart 2 and Table 8 show the movements of the Commonwealth Bureau of Census and Statistics index number of the retail prices of miscellaneous items of household expenditure (average for the six capital cities) beside the movements of comparable index numbers for New Zealand and the United States. No information has been published about the British Ministry of Labour index of the retail prices of miscellaneous items. The index shown for New Zealand is an arithmetic average of the official fuel and light and miscellaneous indexes

CHART 2.

GRAPHS OF INDEX NUMBERS IN TABLE 8.



(*Monthly Abstract of Statistics,* May, 1924, to April, 1927) with fuel and light given a weight of 5 and the miscellaneous items a weight of 14. This corresponds closely to the weights assigned to these groups in the compilation of the official "all groups" index number, which were 5.22 and 13.95 respectively (*New Zealand Statistical Report for* 1925, p. viii.). The index shown for the United States is a simple arithmetic average of the house furnishing goods, fuel and light, and miscellaneous indexes published by the United States Bureau of Labor Statistics (*Monthly Labor Review,* Feb., 1927). The New Zealand miscellaneous, and fuel and light indexes are given for convenience in Appendix E, and the United States house furnishings, fuel and light, and miscellaneous indexes in Appendix F.

TABLE 8.

Index Numbers of the Retail Prices of Miscellaneous Items of Household Expenditure, including Fuel and Light.

	Australia		New Zealand.		United States.	
	Miscellaneous Index. Av. for six capital cities, Nov., 1914 = 1000.		Arith. Av. of the miscellaneous and fuel and light indexes, weighted thus: Misc. 14, F. and L. 5. July, 1914 = 1000.		Simple arithmetic average of the house furnishing goods, fuel and light, and miscellaneous indexes. 1913 = 100	
1913						100
1914	Nov.	1000	July	1000	Dec.	103
1915	Nov.	1050	Aug.	1052	Dec.	106
1916	Nov.	1071	Aug.	1205	Dec.	117
1917	Nov.	1178	Aug.	1400	Dec.	138
1918	Nov.	1298	Aug.	1645	Dec.	176
1919			Feb.	1805		
			Aug.	1866	June	181
	Nov.	1384			Dec.	204
1920			Feb.	2041		
					June	222
			Aug.	2189		
	Nov.	1594			Dec.	230
1921			Feb.	2289		
					May	213
			Aug.	2248	Sep.	204
	Nov.	1349			Dec.	202
1922			Feb.	2134	Mar.	195
	May	1338			June	193
	Aug.	1338	Aug.	1954	Sep.	196
	Nov.	1334			Dec.	198
1923	1st qr.	1330	Feb.	1879	Mar.	201
	2nd qr.	1334			June	201
	3rd qr.	1336	Aug.	1826	Sep.	202
	4th qr.	1336			Dec.	203
1924	1st qr.	1338	Feb.	1854	Mar.	202
	2nd qr.	1344			June	198
	3rd qr.	1343	Aug.	1783	Sep.	198
	4th qr.	1336			Dec.	199
1925	1st. qr.	1326	Feb.	1751		
	2nd qr.	1323			June	198
	3rd qr.	1324	Aug.	1740		
	4th qr.	1323	Nov.	1711	Dec.	202
1926	1st qr.	1323	Feb.	1708		
	2nd qr.	1322	May	1736	June	198
	3rd qr.	1341	Aug.	1753		
	4th qr.	1342	Nov.	1753	Dec.	200
1927			Feb.	1743		

The impression that the Commonwealth clothing and miscellaneous indexes underestimate the rise in the cost of these items since 1914 is strengthened by this comparison with the comparable indexes in other gold standard countries. A further

examination suggests that the New Zealand clothing index is very probably the one among the five clothing prices index numbers of Table 7, which best represents the course of retail clothing prices in Australia.

The movements in the British index differ so much from the movements of the other indexes, and it shows in 1926 a percentage increase over the 1914 level so much bigger than the other indexes, that one cannot trust it as an indication of the rise in clothing prices in Australia. It is based on the price movements of only 30 commodities, whereas the New Zealand index is based on 55 price quotations. It is possible that the weight of 3 given to the price of materials in calculating the indexes of groups (2) and (4) in the British Ministry of Labour clothing index is too great to represent the amount of home-made clothing in Australia. It is just possible that the New Zealand indexes of the retail prices of clothing and miscellaneous items did not rise as high from 1914 onwards as the Australian price level of the goods represented in them. But only the compilation of a good index number for Australia would solve that doubt. It is possible also that the New Zealand indexes mentioned rose higher in the period than the Australian price level of the goods included in them. In the fourth quarter of 1925 the retail clothing prices index for the four chief cities in New Zealand was 1599, that for Wellington 1854, and the average for the other three cities 1513. In the first quarter of 1927 the average for the four cities was 1519, the index for Wellington 1790, and the average for the other three cities 1429. It is very strange that there should be such a big difference in the increase in the cost of clothing in the four cities of New Zealand, and one immediately wonders whether the retailers, in filling in the forms, have been following the same practice in the different cities. The Wellington index may exaggerate somewhat the rise in the cost of clothing in Wellington from 1914, but, on the other hand, the indexes of the other cities may underestimate the increase in those cities, through the retailers not being careful enough to allow for changes in the quality of goods or style of garments being worn. It is possible that greater improvements in the selling of clothing have been possible in the three cities in the period than in Wellington, and in this case the price of clothing might actually not be so much above the pre-war level in them as in Wellington. The Wellington index was about the same amount higher than the indexes for the other three cities in the rest of the period, November, 1925, to May, 1927, as at the dates men-

tioned. This is the only period for which the separate indexes for the four cities can be found in the *Monthly Abstract of Statistics*. There is little published information to aid us in estimating whether the Wellington index or the average for the other three cities is the closer approximation to an exact measurement of the change in the average price level of clothing in the four cities. There is no published information about retail clothing prices in New Zealand in 1914, and only wholesale prices quotations for textiles (*Inquiry Into Prices, New Zealand*, 1914-19), namely, Horrockses' A1 calico, 36 inch, the price of which in the second quarter of 1927 was 109% above the 1914 level; Crewdson's No. 2 calico, which was 108% higher; woolpacks, which were 86% higher; and cornsacks, which were 77% higher. This, at least, does not argue against the Wellington index, though, of course, one could not rely on four quotations. This trouble does not arise with the New Zealand miscellaneous index, for the indexes of the four cities are much more alike. The index for Auckland was even above that for Wellington in the fourth quarter of 1925, and not far below in the others. In the first quarter of 1927 the average for the four cities was 1734, the index for Wellington 1770, and the average for the other cities 1722. The fuel and light index in the same quarter was highest for Auckland and Christchurch and lowest for Dunedin. The best measurement according to available evidence, of the change in clothing and miscellaneous prices in the four cities, seems to be the average for the four cities.

Two other considerations suggest that the New Zealand indexes in Tables 7 and 8 represent the changes in prices in Australia of clothing and miscellaneous items respectively better than the official Commonwealth index numbers. 1. The buying and selling rate in the cheque paying banks in Victoria for bills and drafts at sight on New Zealand never diverged from the pre-war parity by more than 1¼% in the period 1912-13 to 1915-16, or in the period 1918-19 to 1925-26 (*Finance Bulletins of the Commonwealth*, Nos. 7 to 17). The information about the year 1916-17 and 1917-18 was not published in the *Finance Bulletins*. This is a fairly good indication that there was no considerable divergence of the Australian prices of goods, with a small cost of transport, from the New Zealand prices, except such as might be caused by tariff changes. A good many of the items in the clothing and miscellaneous indexes have a cost of transport which is a small percentage of their total cost.

When we examine the tariff changes from 1914 to 1926 we find that any changes which took place would rather have the effect of making the Australian prices of textiles and boots rise more than the New Zealand. Out of the eight or so most important groups in the clothing and other textiles section of the New Zealand tariff schedule, the only one which shows an increase in the tariff is cotton piece goods, and the tariff on [illegible] goods in Australia increased more in that period. In [illegible]land there was no change in the tariff on apparel, on [illegible]e goods made of wool or containing wool, hats, millinery [illegible]ery, and practically no change in the tariff on boots [illegible] the removal of the duty on children's boots, whereas, in Australia there were increases in the duties levied on these groups of articles. There was no change in the tariff in either country on floor coverings or on household drapery. These two considerations, the variation from parity of the rate of exchange and the tariff situation, are almost as effective in giving an impression that British clothing prices rose in much the same way as the Australian prices. The variation from parity of the Victoria on London sight rate in the cheque paying banks in Victoria in the periods 1912-13 to 1915-16 and 1918-19 to 1921-22 was never greater than $1\frac{7}{8}\%$, and the variation from parity of the Melbourne on London sight rate from 1922-23 to 1925-26 was never greater than $3\frac{7}{8}\%$, and only in 1924-25 was it greater than $1\frac{7}{8}\%$. But reasons have been offered for not considering the British Ministry of Labour index of the retail prices of clothing as a good representative of the changes in the Australian clothing prices.

The conclusion that one comes to after this examination is that Australian clothing prices may have risen higher above the pre-war level than the New Zealand prices, and very probably rose as much above, and that the prices of the goods included in the Australian miscellaneous index very probably rose as much in Australia above the 1914 level as they did in New Zealand. Since the New Zealand indexes of clothing prices and the prices of fuel and light and miscellaneous items are better constructed, they probably represent the courses of retail prices of these classes of goods in Australia better than the published indexes of the Commonwealth Bureau of Census and Statistics, which, as far as one can judge, have a definite downward bias in this period. These probable errors in the Australian clothing and miscellaneous indexes are so big as to have great practical significance. They suggest that the published Commonwealth total household expenditure index under-

estimates appreciably the rise in the total cost of living from 1914 onwards. A method of estimating the probable degree of under-estimation in the published index of total household expenditure is to compile another index of total household expenditure for Australia on the assumption, which has already, in the writer's opinion, been justified as reasonable, that Australian clothing prices from 1914-1927 were as much above the 1914 level as the New Zealand clothing index, and that total Australian retail prices of the miscellaneous items of household expenditure in the same period were as much above the 1914 level as the average of the New Zealand fuel and light and miscellaneous indexes shown in Table 8 and Chart 2. Such an experimental index number is shown in Table 9 and Chart 2 beside the following official index numbers, the food, groceries and housing (all houses) index, the index used by the Commonwealth Arbitration Court in varying its minimum wage, the total household expenditure index (with the rent item the average rent for all houses) up to 1924, and the total household expenditure index (with the rent item the average rent for 4 and 5 roomed houses).

The calculations for this experimental index number are shown in Appendices A to D, and the method is quite simple. Appendix A gives the cost of the regimens in 1911 and in November, 1914, which have been used as bases for the published index numbers, one date for some and one for others. The housing (4 and 5 rooms) index has not been published for the years 1915 to 1919 or for certain dates in the period May, 1922, to the fourth quarter of 1925. Appendix B shows the method of interpolating indexes at the missing points. Appendix C shows how averages of certain dates of the New Zealand indexes of Tables 7 and 8 were substituted for the Australian indexes. For example, the average of the New Zealand February and August indexes was substituted for the Australian May index. Appendix D shows how the general experimental index number was built up from the aggregates at the base periods and the group index numbers. One illustration will suffice here. The Commonwealth total household expenditure index is a "market basket" index. It represents the differences in the cost of providing at different periods and in different places a certain amount of a number of foods and groceries, plus a certain amount of housing accommodation plus a certain amount of a number of items of clothing and miscellaneous items. These various amounts are called the mass units. The aggregate cost of the mass units in each of the four groups is calculated and

an index number is based on them showing the percentage change or the change per thousand from a certain period, which is taken as the base period of the index number. The aggregate cost of the whole market basket is then found and an index number based on that.

The Commonwealth Bureau of Statistics has not published the aggregate cost of the items in the four groups for the different periods, so that the writer used the published index numbers to find the aggregate cost of the items in each group in the following way. The aggregate cost of the mass units of food and groceries in the six capital cities in November, 1914, was 143,144d. (Appendix A.) The food and groceries index shows that their cost had increased from November, 1914, to the fourth quarter of 1925 by 57.8%; that is, the index number was 1578 on the base, November, 1914, equals 1000. If one increases 143,144d. by 57.8% one obtains the figure 225,881d. as the cost of the mass units of food and groceries in the last quarter of 1925. In the same way the housing (4 and 5 rooms) index shows that the cost of the mass unit of housing accommodation had increased from 79,672d. in November, 1914, to 124,209d. in the fourth quarter of 1925, or in the proportion 1000 to 1559, which last is the index for the fourth quarter of 1925. To complete the calculation for the experimental index number all that remained to be done was to calculate what the total cost of the mass units of clothing would have been in the fourth quarter of 1925 if it had risen as much above the 1914 level as the New Zealand clothing index, and what the cost of the miscellaneous mass units would have been if it had risen as much as the average (in Table 8) of the New Zealand fuel and light and miscellaneous indexes. The cost in November, 1914, of the clothing items in the Australian index, namely, 100,329d., was multiplied by 1599 and divided by 1000 and gave 160,426d. as the cost of the mass units of clothing for the last quarter of 1925. The cost in November, 1914, of the mass units of miscellaneous items in the Australian index, 73,699d., was multiplied by the index 1711 and divided by 1000, and gave, as the cost of the mass units of the miscellaneous items in the last quarter of 1925, 126,099d. When these aggregates for the last quarter of 1925 are added they give a total of 636,615d., which, on the base 396,844d. (the cost in November, 1914) equals 1000, gives an index number of 1604.

This experimental index refers only to the average price level in the six capital cities in Australia. But the movements

of the prices of clothing and the miscellaneous items of household expenditure in Sydney and Melbourne are even more likely to be well represented respectively by the New Zealand indexes used for the experimental index than the movements in the average prices in the six capital cities. On the assumption that this is the case, experimental indexes for November, 1920, and the fourth quarter of 1926 for Sydney and Melbourne, have been calculated (Appendix D, Table 2). In all these experimental index numbers, however, clothing is probably overweighted, because of the price quotations obtained for November, 1914, being for goods of better quality or containing more material, and because the aggregate of the index does not contain all household expenditure and the clothing prices rose more than the other prices. In the aggregate for the six capital cities in November, 1914, clothing has 25.3% weight, in the Sydney aggregate of the experimental index for November, 1920, clothing has 31.3% weight, and in the Melbourne aggregate for the same period it has 32.2%. Let us consider along with these percentages the finding of the Basic Wage Commission of 1920 in regard to clothing for Melbourne. The Commission, in its report, suggested that in November, 1914, it required 15s. 11d. to buy the clothing which could be bought in November, 1920, for £1 9s. That is, the Commission considered that the price of clothing had risen only 82.2% in the period. The writer considers that this is an underestimate of the increase, and that the quality of clothing obtainable in Melbourne in November, 1914, for 15s. 11d. was better than the quality of clothing to be obtained for £1 9s. in November, 1920. The same kind of criticism may be made against the estimates of the cost of the Commission's standard of clothing for Sydney for November, 1914, and November, 1920, namely, 15s. 5d. and £1 7s. respectively. The cost of clothing in November, 1914, was only 23.5% of the total finding of the Commission for Melbourne, and only 20.1% of its total finding for Sydney. These considerations suggest that possibly clothing in the index in November, 1914, should have no more weight than about 20%. In accordance with this idea an adjustment was made to the experimental index by which the mass units of clothing were reduced to 75% of their original size and another index calculated. This brought the weight of clothing in the aggregate for the six capital cities in November, 1914, to 20%. Table 9 and Chart 3 show the official indexes, the experimental index and the adjusted experimental index of the cost of living in the six capital

cities. The measurements of the increase in the cost of living from November, 1914, to November, 1920, vary from the 62% of the food, groceries and housing (all houses) index to the 96½% increase of the adjusted experimental index and the 100% increase of the experimental index. Their measurements of the fall in the cost of living from November, 1920, to the fourth quarter of 1926 also differ, being 4% for the food, groceries and housing (all houses) index, 14% for the total household expenditure index, 20% for the experimental index and 18.3% for the adjusted experimental index.

TABLE 9.

Comparison of Published Commonwealth Retail Prices Indexes for the Six Capital Cities with the Experimental Index and the Adjusted Experimental Index.

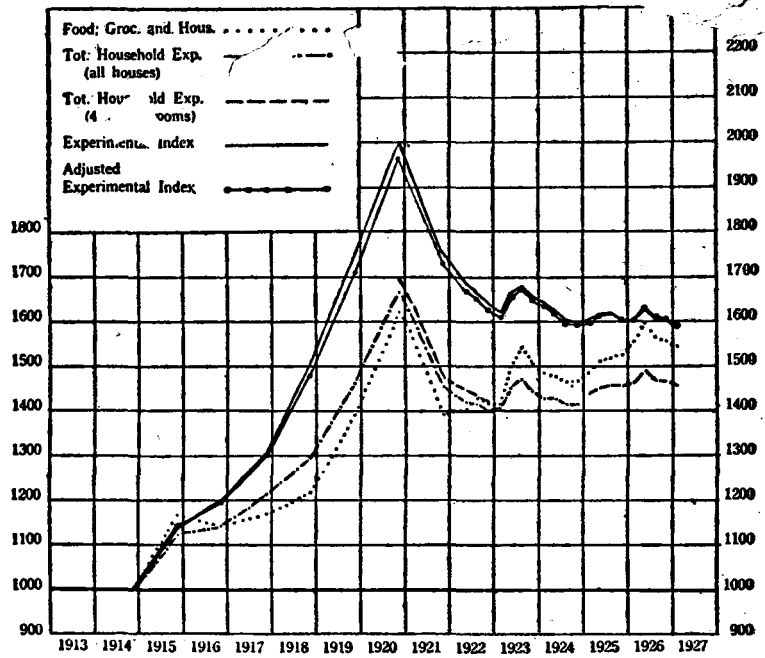
	Food, Groceries and housing (all houses), converted to new base, 4th qr., 1914 = 1000.	Total household expenditure (all houses).	Total household expenditure (4 and 5 rooms).	Experimental index of total cost of living.	Experimental index with the mass units of clothing reduced to 75 per cent. of their original weight.
4th qr. 1914	1000	Nov. 1000	Nov. 1000	Nov. 1000	Nov. 1000
4th qr. 1915	1169	Nov. 1128		Nov. 1140	Nov. 1143
4th qr. 1916	1140	Nov. 1140		Nov. 1200	Nov. 1195
4th qr. 1917	1170	Nov. 1213		Nov. 1317	Nov. 1303
4th qr. 1918	1217	Nov. 1295		Nov. 1510	Nov. 1480
4th qr. 1919	1392	Nov. 1461		Nov. 1747	Nov. 1710
4th qr. 1920	1621	Nov. 1665	Nov. 1697	Nov. 2000	Nov. 1964
4th qr. 1921	1392	Nov. 1454	Nov. 1474	Nov. 1755	Nov. 1729
2nd qr. 1922	1408	May 1420		May 1687	May 1669
3rd qr. 1922	1430	Aug. 1418		Aug. 1666	Aug. 1651
4th qr. 1922	1416	Nov. 1402	Nov. 1420	Nov. 1641	Nov. 1627
1st qr. 1923	1416	1408		1621	1609
2nd qr. 1923	1501	1452		1664	1656
3rd qr. 1923	1544	1472		1682	1675
4th qr. 1923	1503	1446		1654	1647
1st qr. 1924	1487	1428		1642	1635
2nd qr. 1924	1479	1428		1624	1618
3rd qr. 1924	1465	1417		1602	1596
4th qr. 1924	1468	1417		1598	1593
1st qr. 1925	1486		1440	1604	1599
2nd qr. 1925	1511		1451	1616	1613
3rd qr. 1925	1519		1458	1620	1618
4th qr. 1925	1526		1457	1604	1604
1st qr. 1926	1554		1462	1600	1601
2nd qr. 1926	1598		1490	1628	1632
3rd qr. 1926	1562		1469	1605	1609
4th qr. 1926	1554		1464	1600	1604
1st qr. 1927	1542		1453	1585	1589

The significance of the divergences of these published indexes of the Commonwealth from the experimental indexes may best be shown by a few illustrations of estimates of the

Harvester equivalents based on them and of estimates based on them of the money equivalents in 1926 of the wages declared to be reasonable by the Basic Wage Commission in 1920. If we assume that the Harvester equivalent in Melbourne in the fourth quarter of 1914 was £2 13s. 1d., which is the estimate according to the food, groceries and housing (all houses) index,

CHART 3.

GRAPHS OF INDEX NUMBERS IN TABLE 9.



then at the average prices in the six capital cities in the same quarter the Harvester equivalent would have been £2 14s. 9d., the index number for the six capital cities being 1140 for that quarter, while the index for Melbourne was 1106. The Harvester equivalent for the month of November, the mid-month of the last quarter, is sure to have been very close to the equivalent for the last quarter and there is no great error in assuming them to have been the same. On this basis we can now make estimates of the Harvester equivalents for later periods by means of these index numbers.

TABLE 10.

Estimates, based on four of the index numbers of Table 9 and Chart 3, of the Harvester equivalents in certain periods at the average prices of the six capital cities, on the assumption that the Harvester equivalent at the average prices in these cities in the fourth quarter of 1914 and in November, 1914, was £4 14s. 9d., which is an estimate based on the food, household expenditure and housing (all houses, index.

and 18.3% fo

	According to the food, groceries and housing (all houses) index.	According to the total household expenditure (4 and 5 rooms) index.	According to the experimental index.	According to the adjusted experimental index.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
4th qr. 1920	4 8 9	4 12 11	5 9 6	5 7 6
4th qr. 1921	3 16 2	4 0 8	4 16 1	4 14 8
4th qr. 1922	3 17 6	3 17 9	4 9 10	4 9 3
1st qr. 1925	4 1 4	3 18 10	4 7 10	4 7 7
2nd qr. 1925	4 2 9	3 19 5	4 8 6	4 8 4
3rd qr. 1925	4 3 2	3 19 10	4 8 8	4 8 7
4th qr. 1925	4 3 7	3 19 9	4 7 10	4 7 10
1st qr. 1926	4 5 1	4 0 1	4 7 7	4 7 8
2nd qr. 1926	4 7 6	4 1 7	4 9 2	4 9 4
3rd qr. 1926	4 5 6	4 0 5	4 7 10	4 8 1
4th qr. 1926	4 5 1	4 0 2	4 7 7	4 7 10
1st qr. 1927	4 4 5	3 19 7	4 6 9	4 7 0

It can be readily seen that the differences of the estimates of the Harvester equivalents have been considerable for some periods. We find that the total household expenditure index estimate was 14s. 7d. lower than that of the adjusted experimental index in November, 1920, and was 7s. 5d. lower even in the first quarter of 1927, when the indexes were closer together than they had been since November, 1920. The estimate, according to the food, groceries and housing (all houses) index, was 18s. 9d. lower than that of the adjusted experimental index for November, 1920, and 2s. 7d. lower in the first quarter of 1927.

The official indexes and the experimental indexes for Sydney and Melbourne are given below for two periods with, as base, the average for the six capital cities in November, 1914, equals 1000, except that the base for the food, groceries and housing index is the average for the six capital cities in the fourth quarter of 1914.

	Sydney.		Melbourne.	
	Nov. 1920.	4th qr. 1926.	Nov. 1920.	4th qr. 1926.
Food, groceries and housing (all houses) index	1661	1616	1660	1559
Total household expenditure (4 and 5 rooms) index	1736	1505	1706	1438
Adjusted experimental index	2017	1654	1956	1583
Experimental index	2049	1647	1993	1581

A comparison follows of the Harvester equivalents for the two cities for these two dates with the wages considered reasonable for these two cities in November, 1920, by the Royal Commission on the Basic Wage. The estimates are based on the same assumption as those in Table 9, namely, that the Harvester equivalent in November, 1914, and in the fourth quarter of 1914, at the average price level of the six capital cities, was £2 14s. 9d.

Harvester equivalents.	Sydney. Nov. 1920.	Sydney. 4th qr. 1926.	Melbourne. Nov. 1920.	Melbourne. 4th qr. 1926.
	£ s. d.	£ s. d.		£ s. d.
By food, groceries and housing (all houses) index	4 10 11	4 8 5	4 [illegible]	5 4
By total household expenditure (4 and 5 rooms) index	4 15 0	4 2 5	4 13 5	3 18 9
By adjusted experimental index	5 10 5	4 10 7	5 7 1	4 6 8
Wages considered reasonable by Royal Commission on the Basic Wage of 1920	5 17 1		5 16 6	

There is one conclusion from this examination, a conclusion which may be said to be of considerable practical importance, and of interest to economists, members of arbitration courts, and anyone interested in the progress of the community. It is that the Basic Wage Commission standard of comfort, which almost everyone in Australia, perhaps all who thought about the matter considered a great increase over pre-war standards of comfort, represented, very probably, an increase over the Harvester standard of comfort of only about 6% in the case of Sydney in November, 1920, and about 8.8% for Melbourne. The general impression that the Basic Wage Commission standard represented a large increase was based on the measurement of the food, groceries and housing (all houses) index. The Basic Wage Commission wage declaration for Sydney in November, 1920, was 28.8% above the Harvester equivalent according to this misleading index of the cost of living, and the wage declaration for Melbourne for the same time was 28.2% above the Harvester equivalent according to the same index. This widespread notion is expressed, for example, in the *Report of the Economic Commission on the Queensland Basic Wage*, p. 24: "The third standard is that adopted by the Basic Wage Commission in its report of 1920. The family unit taken was a man, wife and three children, and the Commission found that the cost of living was, on an average, about 25% above the Harvester precedent."

Another conclusion of considerable general interest is that the ruling wages in Sydney and Melbourne are very probably much nearer the Basic Wage Commission standard of comfort than people have supposed. The equivalent in Sydney in the fourth quarter of 1926 of the wage of £5 17s. 1d. in Sydney in November, 1920, was, according to the food, groceries and housing (all houses) index, £5 13s. 10d., according to the total household expenditure (4 and 5 rooms) index, £5 1s. 6d., but according to the adjusted experimental index only £4 16s. It appears, then, that it required, very probably, only about 12s. per week to bring a man with the New South Wales basic wage of £4 4s. per week up to the Basic Wage Commission standard for a man, wife and three children, while a man with the Federal basic wage in Sydney of £4 12s. 6d. was probably only about 3s. 6d. below the Basic Wage Commission standard of comfort. As for Melbourne, the wage declared by the Commission as reasonable for November, 1920, was £5 16s. 6d. The equivalent of this in Melbourne in the fourth quarter of 1926, according to the food, groceries and housing (all houses) index was £5 9s. 5d., and according to the total household expenditure index £4 18s. 2d., but according to the adjusted experimental index only £4 14s. 3d. In Melbourne a man with a wife and three children and with the Federal basic wage for that city of £4 12s. very probably required only about 2s. 3d. to bring him up to the Basic Wage Commission's standard of comfort. Many people, including the chairman of that commission, considered that it was very unlikely that the minimum standard of comfort for wage earners could be raised as high in the near future as the Commission considered reasonable without some scheme of child endowment. It appears that it has been almost realised for the wage earners in Melbourne who happen to have the Federal basic wage; it may be realised for all male wage earners in Melbourne and Sydney before long without causing too much unemployment, even without a scheme of child endowment.

The large size of the differences in estimates by means of these index numbers of the money equivalents of the Harvester wage and Basic Wage Commission's wage declaration, bears out the argument that we cannot rely on the published index numbers of retail prices in Australia as measures of the change in the cost of living, and that a better attempt should be made, even if it involves more expense, to compile a cost of living index number for Australia. A further deduction from results of this examination is that such tables of effective or real wages

in Australia as those appearing in the Commonwealth Year Books and Labour Reports are not reliable because they are based on the food, groceries and housing (all houses) index. The same remark may be applied to a calculation of the change in income per head in Australia reckoned at the 1911 price level, which is to be found on p. 15 of the *National Dividend*, by J. T. Sutcliffe.

CHAPTER IV.

THE INDEX OF THE VALUE OF PRODUCTION PER HEAD.

In criticising the mechanical use of a cost of living index number in varying wages, and in suggesting that the capacity of industry to pay should be considered in wage fixing, the Economic Commission on the Queensland Basic Wage suggested that "capacity to pay should be determined from figures showing changes in income per head, past production per head, and future production per head of Queensland," *Report*, p. 91. This notion, that an arbitration court can obtain useful information about the changes in the capacity of industry to pay wages from an index of income per head or of production per head, was brought forward again by Mr. Sutcliffe, who was chairman of the commission, in an article in the November, 1925, issue of *The Economic Record*. It was also mentioned in the 1925 *Labour Report* (published in August, 1926) of the Commonwealth Bureau of Census and Statistics. It is likely that the members of the Commission have modified their opinions since that time, but for the sake of those who still refer to their report and for the sake of those who are impressed by the reference to it in the 1925 Labour Report it may be worth while to examine the notion.

It is important first of all to clear up the meaning of the phrase, "capacity of industry to pay wages." This capacity of industry to pay wages, which the arbitration court was advised to consider, must refer to present economic conditions in which most industry is carried on by private enterprise. An arbitration court is unable to change the ownership of capital, or the control of industry, or the immigration regulations, for example; it must take these conditions as it finds them and fix wages at the most suitable level in the general interest. In other conditions there may be a more suitable basic wage, but it is not the duty of the court to alter these conditions, although the members of a court may draw the attention of a government sometimes to a set of conditions in which the best means of raising the wage level is not the declaration of a higher basic wage but an alteration of these conditions. In any one set of conditions of demand for the finished products and of supply of other factors of production, as a matter of ordinary business

employers will find it profitable to employ a certain number of men at the existing wage level. If wages were 20% lower than this level (with the same efficiency of labour) primary producers would find it worth while to bring more land under cultivation, and they and other employers would find it profitable to employ a few more men and increase the supply of their finished products, even if they had to sell them at lower prices to get rid of the extra supply. If, however, wages were 20% higher some land would not be worth cultivating, and some employers, and, perhaps, very many, would find that they were not able to obtain as much profit at existing prices as to make it worth while to remain in business. Some or all would restrict production below the existing level to try to increase the prices of their products. Some might still find it unprofitable to stay in business, even after the price had been raised as far as possible, and might cease to produce. If the prices could be raised, the employers still producing would be willing to employ rather fewer men at the higher level of wages. If it happened to be impossible for certain of them to raise the prices of their products appreciably because of competition from countries outside the jurisdiction of the wage fixing authority, then some of the less efficient producers would be driven out of business, even though some would be willing to carry on with diminished profits, and some landlords would be willing to let their land at smaller rentals.

It is possible, then, to give quite a useful definition to the phrase, capacity to pay, in the following way: A country's industry, in any one set of conditions, is capable of paying various levels of wages to various total numbers of employees, a certain level of wages to a certain number of employees, a rather higher level to a rather smaller number of employees, and a rather lower level of wages to a rather larger number of employees. The writer should not be misunderstood in this point. It is not suggested that at any one time there is a definite wages-fund, a definite amount of money available for the payment of wages to be divided among the total number of wage earners, whether large or small. The actual sum which will be paid in the form of wages at any one time depends partly on the supply prices of the various amounts of the other factors of production, partly on the supply of labour and the efficiency of employees contributing to production, and partly on the prices at which the different amounts of the products can be sold. It is absurd to talk of industry being capable of paying the basic wage of £4, £5 or £6 without reference to the

number of workers who would be employed at these different wage levels.

The capacity of industry in general to pay wages may be said to increase when employers find it profitable to pay increased wages to the same number of workers or the same wages to an increased number. Capacity to pay may be said to increase by 20% when employers find it profitable to employ the same number of men at wages higher by 20%, or 20% more men at the same wages. It may be said to decrease when employers find it unprofitable to continue paying as high wages to the same number of workers. In the latter set of conditions employers try to lower wages, and if they are unsuccessful they dismiss some employees who, they think, are not worth while employing in the new circumstances. If the capacity to pay decreases and wages do not fall unemployment will increase. Although it is indirect and late in giving warning, a good unemployment index published promptly each month is one of the best indications of a change in capacity to pay. The phrase, capacity to pay, is confusing to some people. It suggests the consideration of how much employers could afford to pay to a certain number of workers; but an arbitration court is not concerned with the level of wages employers could pay their men if the employers were more altruistic and would be content with one-half or one-quarter of their present profits. It is concerned with the level of wages employers are willing to pay in certain conditions. Its object, in addition to aiming at industrial peace, is to fix the basic wage as high as possible in the general interest. If employers make very large profits in one year they may be able to pay higher wages to the same number of employees in the following year, but whether they do so or not depends not on the size of their accumulated wealth but on the profitableness of industry in the following year. Instead of capacity to pay, the courts are really concerned with the employers' willingness to pay, but if the phrase, capacity to pay, is held steadily to the meaning given above, no confusion will arise.

It has been claimed as something, which did not require to be proved, that workers should gain increased wages whenever industry's capacity to pay increases. If, however, the population is growing at such a rate that the increased capacity is required to support the greater number at the existing standard of comfort, and if any increase in the basic wage would cause unemployment to increase too much, then it may not be in the general interest to increase the basic wage. It has been

claimed also that the workers in any specially prosperous industry should share the abnormally high profits and gain increased wages. This cannot at all be taken for granted, because it may be in the general interest to leave wages at the ordinary level so that workers from less prosperous industries may be able to change over to the more prosperous ones, and so that the total production may be so much increased in the more prosperous industries that the prices of the products fall until no more than normal profits can be gained by employers. In these circumstances the gain from increased production per head in one industry will go partly to new workers attracted into the prosperous industry and partly to the general community in the form of lower prices. If in the prosperous industry there are available many economies of large scale production from an expansion of the industry, then it may result in very much greater advantage to the community to leave the compulsory minimum wage in that industry at the old level and to allow the industry to expand more. If, however, the industry is one which can only be expanded appreciably by the use of very much less suitable resources, such as land which gives a very much smaller return to equal applications of labour and capital, then it may do more good to raise the minimum wage in that industry, even although no more workers are engaged, so long as it is not raised so high that some of the former employees are dismissed. In this way the level of wages may be raised in one industry after another until, at a suitable time, the general basic wage may be raised somewhat without causing too much unemployment.

The next step is to examine whether an index of the value of production per head or of value added per head in manufacturing is a good index of changes in the capacity of industry to pay money wages, or an index of the volume of production per head a good index of the capacity of industry to pay real wages. (Value added in manufacturing is now taken to be value of output minus the value of materials and fuel and light used in manufacture). It will be better to consider first, circumstances in which there is no change in the value of money taking place as a result of a change in the supply of money or means of payment or as a result of the change in the velocity of circulation of money. In one particular manufacturing industry it may be possible for the value added per employee to be greatly increased at some time, because of the introduction of more efficient machinery. Sometimes it is possible for employers to dispense for a time with some of their employees until their

market expands. If it is very costly machinery it may not be profitable for the employers to pay even this reduced number of workers wages increased in proportion to the value added per head. If the demand for the product is very elastic, and a very much larger amount can be sold as a result of a moderate fall in price, then the employers may be willing to employ the same number of men as before at the same wages, but they may not be willing to employ the same number if wages are increased in proportion to the increase in value added per head.

It will not be lost time to consider a possible case in one factory. A factory might be employing 100 employees, producing 1,000,000 units in a year at a cost of 2d. each for materials and fuel and light, selling them at 12d. each and paying in the form of wages 5,000,000d. between 100 employees, or £208 6s. 8d. each. If new machinery could increase the production to 1,500,000 units by means of these 100 employees at the old cost of 2d. per unit for materials, fuel and light, and if these could be sold at 10d. each, the total value added per employee would increase from 100,000d. to 120,000d., or by 20%. If wages remained the same the employer would have an extra sum of £8333 6s. 8d. to cover extra interest and depreciation and afford him a profit on the increased production; if wages were increased by 20%, as soon as the increase of 20% in the value added per employee was discovered the employer would have only half that sum for these purposes. If this sum of £4166 13s. 4d. is not sufficient to afford normal interest on the extra capital invested, and to give the employer as big a profit as to make the new production worth while, then he will be inclined to produce less and try to sell the product for a higher price than 10d. per unit. If the employers in this industry are unable to raise prices because of foreign competitors using the new machinery, some of the less efficient may be forced out of business. The more efficient may then be able to expand their sales, gain more economies of large scale production, and make what they think a satisfactory profit while selling at 10d. per unit. This is quite a clear illustration of the fact that although the value added per employee may increase by 20% in an industry, the capacity to pay will not necessarily increase by 20%, that is, it may not be profitable for the employers to pay an increase of 20% in wages to the same number of employees or to pay the same wages to 20% more employees. It will be interesting to compare with this the value added and the average wages paid for the year 1924-5 in groups I. and II. of

the factories in the *Production Bulletins*. Value added per employee in group II. was £537, and only £323 in group I., but the employers in group I. were willing to employ 10,289 employees at an average wage for the year of £196, while the employers in group II. only employed 3,342 workers at an average of £193 (*Production Bulletin*, No. 19). Furthermore, if employers are able to obtain capital on loan at considerably lowered interest they will be willing to pay rather higher wages to the same number of employees if they cannot get their services for the old amount, and this is without any addition to value added per employee. Also, if more employers enter the industry, their competition for the existing supply of labour will tend to raise wages and cause employers to be content with rather smaller profits. This criticism applies to total manufacturing production, as well as to the production of one firm or one industry. In manufacturing industries, capacity to pay may rise, even if there is no increase in the value added per employee, and may not increase when value added per employee rises. Value added per employee cannot be a reliable index of the capacity to pay of manufacturing industries.

When we turn to primary industries we discover a more striking thing. An arbitration court might decree an increase in wages of 30%. This, if enforced, would certainly have the effect of causing some primary producers to restrict production and economise in labour, with resulting increase in unemployment. Primary producers would not be willing to employ the same number of men at the increased wages. They would put out of cultivation the least fertile land or the land most distant from the market; the actual amount of produce per employee would increase partly on this account and partly because the more efficient workers would be retained, and the price also might increase as a result of the decrease in supply. Value of production per head might increase very much as a result of the wage increase, but this increase would be no evidence of an increase in the capacity of the primary industry to pay wages. If wages were raised still further because the value of production per head had increased, it would result only in more employment and greater scarcity of primary products, although, again, it might cause a second increase in the value of production per head. In primary industries variations in value of production per employee are no indication of variations of capacity to pay. If there is a very serious drought, employers in some industries will try to economise in labour, but it will not be necessarily to the same extent as the falling off in the value of production

per head. More ordinary variations in the value of production per head do not cause employers to vary the number of men employed, even if wages remain the same, except in the short periods of harvest time or the time of the wool clip. Employers are better equipped to withstand the variations in income. Wage earners desire as much short period stability in wages as is possible, and employers in primary industries are quite willing to bear most of the burden of variations in income. A 28% fall in the value of pastoral production in Queensland from 1910 to 1911 did not signify that employers would be determined to employ 28% fewer men in 1911 if wages were maintained at the same level, and that they would only employ the same number of men if wages were reduced by 28%.

Let us now consider whether an index of the value of production per head of those engaged in all the industries of the community or per head of population could be an index of the capacity of the country's industries to pay wages. If one takes a very superficial view of the question, one might get a notion that there was a simple relation between them. For instance, if the income of the community were reduced to half, while the same number of people were employed, one might get the impression that the wage level would have to fall 50%. Such a statement as this, "that the productivity of industry is the final source of wages," has been thought, quite erroneously, however, to give countenance to this view. An arbitration court would certainly have to take account of a 50% reduction in the national income per head, because it is certain that wages could not be maintained at their previous level without causing great unemployment. But in doing so it is not necessary to adopt the erroneous opinion that capacity to pay wages has necessarily fallen 50% also. More than one thing may cause a reduction in the national income per head, and capacity to pay may be reduced more or less than 50%. Even for such big reductions in income per head an index of income per head would be too vague an index of capacity to pay, while for increases of 100% it may be quite useless as an index. Income per head might increase 100%, but the supply of labour seeking employment might increase so much that it would be impossible to raise the minimum wage more than 50% without causing what the judges of an arbitration court might think too much unemployment. On the other hand, wages might increase without causing an increase in unemployment, that is, capacity to pay might increase as a result of a fall in the rate of interest, or an increase in the amount of business ability in the community,

even although there had been no increase in income per head. There is this to be said, further, that although a large increase in the basic wage enforced by an arbitration court would have no effect in increasing capacity to pay, and would cause an increase in unemployment, it might result in an increase in the value of production per head of those still left in employment. The industries which would suffer most unemployment would be those in which it was found impossible to raise prices enough, such as trades making comforts and luxuries. The industries making products which are more in the nature of necessaries would maintain production and would be able to raise prices considerably, and the value of production per head in them might increase so much as to make the total value of production per head of those employed in all industries higher than before.

The conclusion so far is that an index of production per head or of income per head does not, in times when there is no change in the purchasing power of money taking place as a result of a change in the supply of money or the velocity of circulation of money, offer a reliable index of the changes in the capacity of industry to pay wages.

In times where there is taking place a big change in the purchasing power of money, both the value of production per head and wages may move so far in the same direction as to obscure for the casual observer the fact that they do not always move to the same extent. Any actual correspondence, of course, in direction and amount of changes in wages and value of production per head is no evidence that capacity to pay varies with value of production per head. In 1920-21 the prices of manufactured goods in general were falling in Australia, most industries were depressed and had suffered a reduction in their capacity to pay wages, but value added per head of those engaged in manufacturing was actually 8.7% more in 1920-21 than in 1919-20. The reason for this is that in a trade depression the prices of raw materials fall much more than the prices of finished products, and manufacturers try to refrain from spoiling their market and rather produce less when they find they cannot sell as much at the previous prices. They economise in labour wherever they can, and of course retain the more efficient workmen, which act in itself contributes to raise the value of production per head.

There are similar theoretical objections to taking an index of the volume of production per head as an index of the capacity of a country's industries to pay real wages, and to varying

real wages in proportion to the changes in an index of the physical volume of production per head, along with other objections based on the quality of the price index numbers available. But no matter how perfect the index numbers of the prices of primary and manufactured products and the index of the cost of living, an index of the physical volume of production in Australia would not be an index of the country's capacity to pay real wages.

It would be worth while to make a very detailed examination of the movements of the indexes of the value of production, value added in manufacture, and volume of production per head of those engaged if we had for this country reliable statistics for the period 1911 to 1926 of the amount of unemployment in the country and the changes in that amount from month to month or from quarter to quarter. It will be worth while, however, to consider the movements of these indexes in Australia at the end of the boom in trade in 1920 and in the severe trade depression which lasted through 1921 and the first half, at any rate, of 1922. The trade union unemployment returns show very high unemployment percentages for the whole of 1921 and 1922. There is other evidence that 1921 was a year of trade depression in most industries and unemployment was abnormally great, though not as great as the trade union statistics suggest. It is certain that the capacity of industry to pay wages was less in 1921 than in the first half of 1920. Yet the value of production per head of those engaged rose from 1919-1920 to 1920-1921 by 13.4%, the value added in manufacturing per head of those engaged increased by 8.7%, and the official rough estimate of the physical volume of production per head of those engaged, found by using the Commonwealth Bureau of Statistics production prices index number, increased by 11%.

Mr. Sutcliffe, in his article in the November, 1925, *Economic Record*, suggested that a forecast could be made in September of each financial year of the total value of production in the financial year. It would require some years of successful testing of these forecasts before any reliance could be placed on them. Even if a perfect forecast could have been made in September, 1921, of the reduced production in the financial year 1921-22, the warning that wages should be reduced so as to lessen unemployment would still have been nearly a year too late. The suggestion to take an average of such an index for, say, the year 1924-25, and the forecast of such an index for the year 1925-26, as even a general guide for varying wages in September, 1925, can be met by an even stronger criticism on

this point that it gives the warning about the necessity of lowering wages sometimes too late, sometimes not at all.

A careful consideration of the points raised in this chapter will reveal that Mr. Sutcliffe has not substantiated the claim made on p. 71 of his article in the November, 1925, issue of *The Economic Record.* "But," he writes there, "the recommendations of the Queensland Economic Commission might well be considered by wage tribunals. The index of value of production, past and prospective, if properly computed, would provide at least an indication of the necessity of a modification of the cost of living basis which may be required to ensure to the workers a share in increased prosperity. If times of depression come and production seriously falls off, the falling off would be indicated by such an index and steps could be taken to prevent the depression being made more serious by awarding wages which may have that effect. It is not suggested that even these index numbers should be used rigidly to vary wages." The objections made in this chapter are that an index of the value of production per head may diverge very considerably from a true index of capacity to pay, that in times of depression the warning is given too late, and that in times of depression and reduced capacity of factories to pay wages the index of value added per head in manufacturing may even rise. The writer suggests to arbitration courts that, until some solid reasons are put forward to justify the use of an index of the value of production per head as an index of capacity to pay, the members should leave the index out of consideration and give their attention to the improvement of statistics of proved value.

CHAPTER V.

OTHER ECONOMIC STATISTICS.

Indexes of Production, Sales, Stocks, Wholesale Prices, Etc.

An arbitration court will benefit from the general development of those statistics which throw light on the changes in the general prosperity of industry and trade.

Elaborate indexes are being developed in Britain and the United States of the physical volume of production in a number of important industries. The London and Cambridge Economic Service publishes quarterly indexes for 15 industries and one combined index for the fifteen. The Harvard Economic Service in the United States publishes a large number of monthly series of economic statistics showing movements in production, sales and stocks in a number of industries and a combined monthly index of the volume of mining production and one of manufacturing production. It publishes also monthly indexes of sales in department stores, mail order houses and chain stores. Both of these economic services publish in addition monthly unemployment statistics and monthly indexes indicative of transport activity, export and import trade, banking operations, stock exchange and foreign exchange transactions, as well as monthly wholesale and retail price index numbers. The Department of Commerce and the Federal Reserve Board in the United States also publish valuable statistical series in monthly bulletins.

These are mentioned only as examples of this kind of work, which has hardly been begun in Australia because of the lack of financial resources and the lack of economists and statisticians with time to devote to it. Moreover, some of the work which has been attempted has been inefficiently done because sufficient money has not been available for the best means. The total household expenditure index number in Australia is one example of an index number which was not worth compiling with the inadequate means at the disposal of the Commonwealth Bureau of Census and Statistics.

It will be worth while to examine the Melbourne wholesale prices index number and the manufacturing production prices index number published by the same bureau, and the Sydney wholesale prices index number published by the State Statistician of New South Wales as further illustration of the need for improvement in existing statistics.

I. Manufacturing Production Prices Index Number.

Let us consider first the manufacturing production prices index number. When information has not been directly available about fluctuations in the physical volume of production, an attempt has sometimes been made to obtain a rough estimate of the fluctuations by correcting the statistics of changes in the total value of production for changes in the price level of the goods included. This attempt has been made in Australia for the annual statistics of the value of production in the agricultural, pastoral, farmyard and dairying, mineral and manufacturing industries, and what are called production prices index numbers have been published in the *Production Bulletins* from No. 13 onwards of the Commonwealth Bureau of Census and Statistics. The index numbers for agriculture, and the pastoral, mining, farmyard and dairying industries are prices index numbers compiled in a familiar way, according to the market basket method. This method is sound, and with good price statistics provides a reliable index.

But an examination will show that the manufacturing production prices index number is compiled on wrong principles, and that any attempt to use it along with statistics of the value added in manufacturing in Australia may lead to erroneous ideas of the changes in the productivity of Australian manufactures.

The index number is meant to measure the average change in the manufacturing cost of all the articles which form the output of the factories included in the returns in the *Production Bulletins*. The value added is defined as the value of output minus the value of materials used, minus also the value of fuel and light used in production. The manufacturing cost of each article is then the price of each article minus the value of materials and fuel and light used in its production. The manufacturing cost, as thus defined, includes profit. If the value added in factories doubles in a certain period, while the average manufacturing cost of the articles included doubles also, then it is clear that there has been in that period no increase in the physical volume of production. The index number of value added needs to be corrected by means of an index number showing the average change in the manufacturing cost of all the articles included, before we can find an index of the physical volume of output in the factories. When we examine the manufacturing production prices index number, we find that it is an index of the cost of running an imaginary factory with a certain

number of employees using engines of a certain total horse-power and with slightly varying margins for profit and miscellaneous expenses. The number of employees is the average number employed in Australia during the years 1908 to 1917, in factories using power or employing four or more hands, and the amount of horse-power is the average horse-power of engines used in the same factories in the same years. The varying margins for profit and miscellaneous expenses are calculated in the following way: In a table on page 139 of *Production Bulletin* No. 19, the value of output in this class of factories is divided up into the value of materials used, the amount of salaries and wages paid, the value of fuel and light used, and the remainder, which is the margin for profits and miscellaneous expenses. This margin for 1924-5 is found to be 41.41% of the value of output minus the value of materials used. The average wage paid in factories and the average cost of fuel per horse-power of engines used is found for each year, and the wages and fuel cost for this imaginary factory calculated, and to this cost is added the calculated margin for profit and miscellaneous expenses. The wages and fuel cost of this imaginary factory increased by a certain margin for profit, and miscellaneous expenses is made into an index number, but what we do not learn from this index is what it is supposed to show, the change in the average cost of manufacturing the articles.

The actual output of articles per employee in the country's industries may increase, and the average manufacturing cost per article decrease, but as long as average wages do not change, or the cost of fuel per horse-power of engines used, or the margin for profit and miscellaneous expenses, this index number will show no fall. If wages or the margin of profit and miscellaneous expenses rise, the production prices index number may rise even when, as a result of improvements in organisation, the actual average manufacturing cost per article has fallen. Even if the average physical output per employee increased by 20% in the course of 10 years, while average wages and fuel cost and the margin for profit and miscellaneous expenses remained the same, and the value added per employee also remained the same because of the necessity of selling the increased product at lower prices, yet the manufacturing production prices index number, if used to correct the index of the value added per head for changes in the price level, would suggest that there had been no change in the physical volume of production per head in that period.

In spite of this serious error in the compilation of the Commonwealth Statistics Bureau manufacturing production prices index number, it has been used to suggest that the volume of production per person engaged in factories in Australia increased from 1911 to 1924-5 by only 8%. In this same period we find that the horse-power of engines used per person engaged in those factories increased by 195%. If we restrict our examination to the factories other than those in the Heat, Light and Power group in the *Production Bulletins*, we find that the horse-power of engines used per person engaged in those factories increased by 89% from 1911 to 1924-5, and by 101% from 1911 to 1925-6 (Appendix G). This small increase of only 8% in the volume of output, in spite of the large increase in the horse-power of engines used per person employed is rather surprising, since the average working hours in factories in the capital cities have decreased by about 3.2% only from 30th April, 1914, to 31st December, 1925 (Appendix H), and probably had not fallen appreciably from 1911 to 1914. This 8% increase may or may not be near the truth, but we know already that the index is badly constructed and gives no evidence on the subject. If as a result of increasing efficiency, manufacturing costs from 1911 to 1924-5 had risen only 70% instead of 90%, as suggested by the manufacturing production prices index number, the actual figures of value added per person engaged mean an increase in the volume of output per person engaged of about 20%. If manufacturing costs had risen only 60% it would mean an increase in the volume of output per person engaged of rather over 25%; even if the manufacturing costs had risen as much as 80% it would mean an increase of about 13% in the volume of output per person engaged.

This misleading index of the volume of output in Australian manufacturing industries is shown in Appendix I. along with the materials for its compilation for the sake of any who may find it necessary to criticise it.

II.—Wholesale Prices Index Numbers.

When Sir G. H. Knibbs compiled the Melbourne wholesale prices index in 1911-1912, very little was demanded of an index number of wholesale prices. If there could be shown a rough correspondence between the changes in the world supply of gold and the index number, most people were content. But now very much more accuracy is demanded. Economists in Britain and America are accustomed to regard a certain kind of wholesale prices index number as a fairly good indicator of the state of trade and industry in general. Professor Irving

Fisher, in an article in the June, 1925, *Journal of the American Statistical Association*, has shown a remarkably close correlation between the rate of change of the wholesale prices index of the United States Bureau of Labor Statistics moved forward in a special way and the index of the physical volume of production published by the Harvard Economic Service. Economists also have begun to use the published indexes of wholesale prices as a means by which to measure the relation of internal prices in different countries, although a number of apparent differences in prices levels are due to differences in the form of the index numbers, while other real differences may be hidden.

The Melbourne index is taken most often to represent Australian conditions, and is the only wholesale prices index published in the Commonwealth statistical publications. On that account more attention will be devoted to criticising it than will be given to the Sydney index of wholesale prices, although the latter has smaller faults, as will be demonstrated later, and is published in a much better way. Each year since 1919-1920 in the *Statistical Register* of New South Wales there have been published the monthly prices of all the commodities included in the Sydney index number, whereas up to 1926 only the annual average prices have been published for the commodities in the Melbourne index. These annual average prices are given in the annual *Labour Report of the Commonwealth Bureau of Census and Statistics.*

Professor Wesley C. Mitchell, in his work on index numbers published as *Wholesale Prices Bulletin* No. 284, of the United States Bureau of Labor Statistics (p. 26), lays stress on the need for publishing the actual price quotations: "Unfortunately most compilers of index numbers publish only the final results of their computations on the ground of expense or lack of interest in the detailed information. But much is sacrificed by taking this easy course. Second, and more important, the publication of actual quotations greatly extends the usefulness of an investigation into prices. Men with quite other ends in view than those of the original investigators can make index numbers of their own adapted to their peculiar purposes, if provided with the original data. . . . For such data are the material with which all investigators must deal and without which no bits of insight can be tested. Indeed, it is probable that long after the best index numbers we can make to-day have been superseded, the data from which they were compiled will be among the sources from which men will be extracting knowledge which we do not know enough to find."

Wholesale prices index numbers should be published monthly, along with the actual monthly price quotations if the Government can afford it. At present not even the general Melbourne index is published monthly, although it is possible, through the courtesy of the Commonwealth Statistician, to obtain notification by letter of the indexes of the eight groups of the Melbourne wholesale prices index. This is not enough for many important purposes. At least it is quite cheap for the Commonwealth Bureau of Census and Statistics to publish the monthly prices for three months in each *Quarterly Summary*. It would be quite cheap also to publish alongside the price quotations the cost of the mass unit of each commodity. It is also worth while to publish in an annual volume the monthly price quotations for every month in the year, as is done by the New South Wales, the New Zealand and the United States Governments.

The formula adopted for the Melbourne and Sydney indexes and advocated strongly by Sir G. H. Knibbs in *Labour Report* No. 1, is a good one. It is the "market basket" formula according to which the index number represents the changes in the cost of providing certain amounts of a certain number of commodities at the different price levels of different times. The same formula is used in the indexes of the New Zealand and United States Governments. It is an excellent substitute, in Irving Fisher's opinion, for his "ideal formula," and in the opinion of Mitchell it is better for general purposes than the ideal. It is easier to compute and is practicable in many cases when the ideal one is not. This is the only method of compiling prices indexes which will be considered here.

Insufficient attention, however, has been paid to the question of sampling. In all the indexes mentioned the commodities are weighted in accordance with their importance relative to each other. But it is impossible to ensure good sampling with as small a number of commodities as eighty or a hundred with this system of weighting, and if care is not taken in selecting a small sample queer results may be obtained. For example, in the Melbourne index in 1915, based on 92 commodities, hay and chaff together had a percentage weight of 20%, which will be shown to be a bad mistake. Even if reliable price quotations could be secured for 1400 commodities the number would not be great enough to relieve the compiler from the task of seeing that the different groups of commodities entering into wholesale trade are adequately represented. The United States War Industries Board included in its general wholesale prices index

number price quotations for 1366 commodities, but, not content with this, it adopted an elaborate system of class weights in the attempt to give each class of goods its proper importance in the general index and to avoid "the haphazard weighting of classes which would result from merely adding class aggregates." (*Wholesale Prices Bulletin* No. 284, United States Bureau of Labor Statistics, p. 142.) One compiler may be able to obtain few quotations for other goods than agricultural products. If he does not adopt some system of class weighting, his index number purporting to be a general wholesale prices index number will be merely a rather distorted index number of the prices of agricultural products.

It is not going too far to call the Melbourne wholesale prices index number a slightly distorted index of the prices of agricultural and dairy products and meat, because in 1914 the commodities in these groups in the Melbourne index had 52% weight, and in 1915 as much as 62% weight. Writers should be cautious in drawing conclusions from an examination of the movements of the Melbourne index. In his article on *Forecasting Economic Conditions in Australia,* in the November, 1926, *Economic Record,* Mr. Barkley does not seem to be aware of this distortion. His discussion of the relationship of spring rainfall in Northern Victoria and the general wholesale price level in Melbourne is considerably weakened on this account, and he cannot be held to have shown that the spring rainfall statistics in Victoria have any value in forecasting general wholesale prices in Melbourne. The main resemblance between the two curves in his Fig. 7, p. 169, is due to the influence of the note issue on the wholesale price level. The resemblance between the two curves from 1915 to 1916 brought about by the fall in the Melbourne wholesale prices index from 1915 to 1916 is entirely due to this distortion of the Melbourne index through too much weight being given to agricultural products. It will be shown in this chapter that the wholesale price level in Melbourne rose considerably from 1915 to 1916.

What are the principles on which a sample of commodities should be selected and weighted? The number of commodities should be big enough to make any inevitable errors in the price quotations unimportant. In a market basket index number the number should be large enough to prevent any one commodity, even if it is considered a good representative of omitted commodities, having more than about 3% weight. If enough price quotations cannot be found then a system of artificial

weights should be adopted or a system of group weights superimposed on the general system of weighting. The number of commodities cannot be decided without considering the groups to be represented. The only basis for selecting and weighting commodities to represent the general course of prices of any group is the behaviour of the prices of the commodities in the group. Each distinct type of behaviour should be adequately represented. This point is emphasised by Mitchell in *Bulletin* No. 284, mentioned above, and by Irving Fisher in his work on the *Making of Index Numbers*, p. 335. Adequate representation is secured for a class of goods with similar price movements when the percentage weight allotted to their representatives in the index number in a recent normal year is equal to the percentage weight of the class of goods in total wholesale trade in a recent normal year. The chief limitation to this statement is that the percentage weight in the index of those products which rise in price very much in periods of great scarcity should not be allowed to be larger, even in periods of very high price, than the percentage weight of such goods in total wholesale trade in a normal year. This will result in the percentage weight of agricultural products in the index in normal years being less than the percentage weight of these products in wholesale trade in a normal year, but in normal years the price movements of such products are more like the price movements of many other commodities included, and this does not distort the index number as much as allowing too much weight in drought years to these products. Care in weighting agricultural products is specially necessary in Australia, where severe droughts cause very large fluctuations in harvests and in prices. In 1919-1920 the wheat crop was 42 million bushels, in 1915-1916 179 million, and in 1920-1921 146 million. 1.7 million tons of hay were produced in 1914-5 and 5.6 million in the following year.

Some general remarks may be made about the different price fluctuations by way of illustration. In making a general wholesale prices index number commodities which rise very much in price in droughts and those which do not should be adequately represented. Among raw materials, mineral products, agricultural, animal and forest products fluctuate in price differently and should have sufficient representation. Manufactured commodities should have adequate representation because their price movements differ from the price movements of raw materials. Mitchell gives a good illustration of this

on p. 50, *Wholesale Prices Bulletin*, No. 284. There is no difficulty in securing adequate representation of manufactured commodities except the expense of adding to the number of commodities included in the index number, and the trouble of replacing commodities which change in quality or which become unimportant by others for which overlapping quotations can be found. Among manufactured products consumers' goods and producers' goods fluctuate differently in price, so that it is not sufficient to represent manufactured products by the raw materials or semi-manufactured products used in making them, as is done roughly in the Sydney wholesale prices index number. Branbags, woolpacks and cornsacks, and raw cotton and wool all fluctuate too much in price to be good representatives of the textile group. They all fell too much in price from 1920-21, for example. Cotton in 1921 in the Melbourne index was almost as low as the 1910 price, and wool and jute goods almost as low as the 1913 level; in certain months of 1921 in the United States the prices of raw wool and cotton were below the 1913 level, yet in the United States Bureau of Labor Statistics index of wholesale prices the cloths and clothing group in 1921 was still 79.5% above the 1913 level. In justice to the compilers of the Sydney wholesale prices index number, it may be stated that all that is claimed for the index in the 1919 *Year Book* of New South Wales (p. 483) is that it probably affords "a fair indication of the general movement of prices over relatively long periods of time." It would entail a thorough examination from time to time of the trend of the price movements of the different commodities and different groups of commodities to make sure whether the index was performing even this function satisfactorily. We should, however, not rest content with this if a better index number can be provided at a reasonable cost, which can show with fair accuracy the movements of the general price level from year to year and month to month.

Professor Mitchell, in suggesting a classification into 1. Raw materials—(a) farm crops, (b) animal, (c) forest, (d) mineral products, and 2. Manufactured products—(a) consumers' goods, (b) producers' goods, as the most significant arrangement of commodities in a general wholesale prices index number at the time of writing *Bulletin* No. 284 (namely, 1921), pointed out that "knowledge of the interrelations of prices even in the recent past is very limited,"[1] and that "a change in the social conditions under which business is done may at any time produce new groupings of commodities important to the

maker of index numbers, or may cause old groups to fluctuate in novel ways" (p. 56). Since *Bulletin* No. 284 was written, Mr. J. L. Snider has examined the quarterly price fluctuations in the United States of 94 commodities from 1866 to 1890, and has published the results in the April, 1924, issue of the Harvard *Review of Economic Statistics*. He has shown that, for the period 1866-1890 Mitchell's suggested groups do not contain goods with similar price movements. During that period the price movements of wool, for example, which is included in the farm products group in the United States Bureau of Labor Statistics index, resembled closely the price movements of metals and were quite different from the price movements of farm products and other animal products. Mr. Snider classified the 94 commodities in 8 groups of distinctly different price behaviour and one miscellaneous group for 16 commodities which did not fall into any definite group. Farm crops appeared in all Mr. Snider's groups except the metals and wool group and the "inflexible" group, animal products in all except one group, producers' goods in five groups besides the miscellaneous group, and consumers' goods in six groups. Further investigations along the lines of Mr. Snider's work, using monthly price quotations, especially if published in rather lengthier form than was possible in the *Harvard Economic Review*, should be very useful in helping towards a better classification.

In this connection it may be mentioned that commodities which have very violent seasonal fluctuations in price should either be excluded from a general wholesale prices index, or else considered different commodities at different seasons. Royal Meeker, for example, has suggested that new potatoes, which at the beginning of the season sell for two or three times the price of old potatoes, should be considered a distinct commodity (*United States Bureau of Labour Statistics Monthly Labor Review*, March, 1919, p. 4).

Since it is impossible to examine directly the different price movements among all commodities, and since we have to try to judge by a sample, it may be wise to give some heed to the principle of weighting suggested by Professor Edgeworth in the *Economic Journal* of June, 1918, and endorsed by Mitchell, according to which less weight should be given in the finding of an average to a measurement of price change which differs largely from the average. We cannot entirely disregard a price quotation which differs largely in its movements from the movements of all the other price quotations obtained, in the same way as we could disregard a measurement which differed largely

from a number of other measurements made of some object. Suppose that commodity X in a strict system of weighting the goods in a sample according to relative importance in trade, has a percentage weight of 5%, but that it fluctuated much more violently in price than the others. Edgeworth's principle suggests that such a commodity may have too much weight. A way of preventing such a commodity from having too much weight in a market basket index number may be suggested here. We should not allow such a commodity a greater percentage weight than it has in total wholesale trade, which may be as low as one-tenth of one per cent., unless we know that its price movement is very similar to the price movements of a number of commodities which are omitted from the index, and which it might be considered to represent.

Let us consider the Melbourne and Sydney index numbers in the light of these general principles.

In the Melbourne index in 1908 hay had 19% weight and in 1915 hay had 9.5% and chaff 10.7% weight. Up to 1911 2.7 million tons of hay were included in the bill of goods on which the Melbourne index is based, but after that year the compiler included instead 1.35 million tons of hay and 1.35 million tons of chaff. Agricultural products rise very violently in price in Australia in drought years such as 1908 and 1915, and hay and chaff rose more than the others from 1914 to 1915. There is reason then for allotting to hay and chaff and to agricultural products generally no more than the percentage weight which they have in total wholesale trade. There are other commodities to which this stricture applies. Meat rises very much in price in Australia in drought periods and dairy products also, though to a less extent. All these products fluctuate in price in a manner which differs very much from the manner in which the prices of manufactured products, even foods, fluctuate. The meat index in the Melbourne wholesale prices index increased by 98% from April to August, 1923, and fell by December to less than two-thirds of the August level. This huge rise happened at a time when the indexes of all the other groups fell except two, which rose less than 1%. Coal has risen steadily in price in Melbourne from 1906 to 1926, but most other commodities have fallen in price from 1920 to 1926. Cotton and wool, branbags, cornsacks and woolpacks were down in 1921 practically to pre-war prices, while most goods were still about 100% above. The compiler of a wholesale prices index should be careful not to give too much weight to any of these commodities, a big movement of the price of which may distort the index. We shall

find, however, that it is impossible to make a very reliable index number of the general wholesale price level for Melbourne or Sydney with the price quotations used in the Melbourne and Sydney indexes, because in neither is there sufficient representation of manufactured products and because in reducing the percentage weight of the commodities which are the worst offenders by reason of very great price fluctuation we are almost bound to give too much weight to others which still offend by too great price fluctuation, although not so much as the first ones mentioned. Unless we give some goods too much weight, some groups, for example, textiles and metal manufactures, would not be represented at all. It might be better to abandon entirely the general system of weighting the commodities in proportion to their importance in trade, and to weight them in proportion to their value as representatives of the general price movement, but this could not be done without an extensive preliminary examination to establish the value of the different goods as representatives of the general movement.

There are no statistics of the total value of wholesale trade collected, as far as the writer knows, for any country, but one can obtain some notion of how small a proportion the value of hay sold is of the total both for Australia and the United States. One should note first that a large proportion of the hay produced is not sold but consumed on the farms. In the report of the 1919 Census of the United States (Vol. V., p. 718) an estimate is given that only about 288 million dollars' worth of hay was sold out of a total production valued at 2,316 million dollars, the amount sold being 12.4% of the total. In Australia hay is grown much more as a money crop. According to one estimate by a produce merchant as much as half of the hay produced in Australia is sold, and even bigger percentages of other fodder crops, such as maize.

The total value of wholesale trade in one year is sure to be larger than the total value of the output of all industries plus the value of imports. Some goods produced are not sold but are used within the same business organisation, like some of the hay, coal, pig iron, and yarns produced, but others are sold at wholesale more than once. The total value of wholesale trade in Australia may be nearly as large as total bank clearings in the six capital cities, because, although a number of transactions by cheque are concerned not with wholesale sales, but with retail sales, payments of rent and interest, payments for securities or payments from one bank account to another belonging to the same person or firm, yet the cheques concerned with many whole-

sale transactions do not pass through the clearing houses, since they are paid by one customer of a bank to another. The total bank clearings for the six capital cities in 1925 amounted to £m. 2203 (*Commonwealth Finance Bulletin*, No. 17).

In Australia in 1924-5 the total value of production shown in the *Production Bulletin* No. 19, p. 163, was £m. 449, the value of fuel and light used in "factories" £m. 11.7, p. 135; the value of materials used in "factories" £m. 222, p. 136, and the total value of imports in the same year £m. 157; these together make a total of £m. 840. This £m. 840 does not include total value of output of all industries because from "factory production" in the *Commonwealth Production Bulletins* there is excluded all the production of factories which do not use power and which do not employ four or more hands. The figure of £m. 840 is rather an underestimate of the total value of output, plus imports, but it is a convenient figure to work with, and it is not worth while for this purpose to try to make a vague estimate of the value of excluded output. The value of hay produced in Australia in 1924-5 was £m. 18.5 (*Production Bulletin*, No. 19). Half of this, or £m. 9.3, is only 1.1% of £m. 840 and only .42% of £m. 2203.

A rough estimate for the United States of the total value of output of all industries plus the total value of imports is given in the following table at 90,900 million dollars. This is also rather an underestimate for the output of factories the products of which in 1919 amounted to less than 500 dollars was omitted. (*Abstract of* 1919 *Census*, p. 914). It will be observed that some of the items give value of output and some value of products sold.

TABLE 11.

Total value of output in all industries in the Continental United States, plus the total value of imports in the year 1919. *Unspecified page references are to the Abstract of the* 1919 *Census.*

	Million dollars.
Value of live stock products, except meat, p. 789	2,667
Value of all domestic animals sold or slaughtered, p. 807	3,511
Value of all crops, p. 809	14,755
Value of forest products, p. 884	394
Value of products of nurseries sold, p. 885	20
Value of products of greenhouses sold, p. 885	77
Value of output in manufactures, p. 916	62,418
Value of products in mining industry, p. 1267	3,158
Total value of output	87,000
Total value of imports, p. 426, Statistical Abstract of the United States, 1919	3,900
Total value of output plus imports	90,900

The value of hay estimated to be sold in the United States in 1919 was 288 million dollars, which is .3% of 90,900 million dollars.

The calculations for Australia suggest that in a general wholesale prices index number in Australia hay should have less than 1% weight and possibly less than .4%, so that even if it doubled in price it could not make the general index rise by as much as 1%. Probably the best thing to do with such a commodity is to omit it and include other commodities as representatives of agricultural products. The mere omission of hay and chaff from the Melbourne index causes the index to show a much smaller rise from 1907 to 1908, and causes it to show a rise from 1915 to 1916 instead of a fall.

It is possible, by making a few calculations in this way, to obtain a rough notion of the relative importance in wholesale trade of the different groups of commodities in the Melbourne wholesale prices index. It is, without doubt, premature to try to settle the many questions concerning the relative importance of the different groups of commodities in the index number of wholesale prices before the different groups have been established according to their differences in manner of price fluctuation and the differences in the trends of their prices, and the Melbourne grouping is not adequate for this purpose. But these groups in the Melbourne index are not unsuitable for one important purpose, that is, to show roughly the relative importance of those groups which rise very much in price in times of drought and those which do not, because most of the commodities which rise greatly in price at those times are contained in the Melbourne groups, agricultural products, dairy products and meat. The calculations in Appendix J, although referring only to one year, are interesting as indicating roughly how far to reduce the percentage weight of the products of these groups in an attempt to calculate an index number in which such products would have only their own proper percentage weight. The calculations in Appendix J suggest very strongly that agricultural products in an Australian wholesale prices index should not have a greater weight than about 12%, dairy products no greater weight than about 5½%, and meat no greater weight than 6% or 7%. A comparison of these amounts with the percentages in Table 12, which follows, shows that these commodities are very much overweighted in the Melbourne and Sydney indexes, and that meat, even in the United States index, is very much overweighted, although the overweighting in that index does not happen to do as much harm as in the Melbourne and Sydney

indexes because of the greater fluctuations in the price of meat in Australia. Appendix J also suggests that metal manufactures and coal should have about 17½% weight in a general wholesale prices index in Australia, textiles and their raw materials and boots and leather about 21½%, groceries about 10%, building materials about 3%, and chemicals about 1½%, and that other goods should be included in the index to represent omitted commodities.

Table 12 gives a comparison of the percentage weights in the Melbourne, Sydney and the United States Bureau of Labor Statistics indexes in the year 1915. The groups are similar in the Melbourne and Sydney indexes except that they are numbered differently. The commodities in all three indexes have been arranged in the groups of the Melbourne index. There have been included from the United States index not only the commodities which appear in the Melbourne index, but also those which correspond to the commodities in the Melbourne index which do not appear in the United States index. Branbags, cornsacks and woolpacks are the only representatives of textiles in the Melbourne index, and in the Melbourne index in 1915 had a percentage weight of 1.23%. In this arrangement 1.23% weight was added to the percentage weight in the United States index of the other commodities which appear in the Melbourne Group II., namely cotton, wool, leather, twine and tallow, on the assumption that some of the textiles which appear in the United States index correspond to these three textiles in the Melbourne index. The percentages for the United States index are taken from *Wholesale Prices Bulletin*, No. 200, United States Bureau of Labour Statistics. The others are worked out from the price quotations in *Labour Report* No. 7 and the New South Wales *Statistical Register* for 1919-1920.

TABLE 12.

Percentage weights at 1915 *prices of certain groups of goods in three wholesale prices index numbers.*

Groups in the Melbourne Index.	Melbourne Index.	United States Bureau of Labor Statistics Index.	Sydney Index.
Group I., Metals and coal	10.98	11.42	12.7
Group II., Wool, cotton, etc.	10.85	7.84	10.2
Group III., Agricultural products	38.15	16.42	25.2
Group IV., Dairy produce	8.99	7.13	9.4
Group V., Groceries	10.88	8.44	13.9
Group VI., Meat	15.30	15.29	18.0
Group VII., Building materials ..	4.29	9.03	9.9
Group VIII., Chemicals	.59	1.28	.8
Total of Groups III., IV. and VI. ..	62.44	38.84	52.6

This table shows that the goods included in or corresponding to the goods included in the Melbourne index have only a percentage weight of about 77 in the larger sample of goods in the United States index. The largeness of the sample is partly the explanation of the smaller percentage weight allotted to agricultural products in the United States index; it is to be explained also by the fact that estimates have been made in the United States of the amount of corn, oats, barley, and hay sold in the Census year 1919, and those amounts have been used as weights instead of the very much larger figures of production or consumption. The weighting of the United States index is very much better than the weighting of the other two indexes, because of the effort to find the amount sold of certain goods and to weight the commodities accordingly and because of the much larger representation of manufactured goods. In 1915 the percentage weight in the United States index of textiles was 10.9. In the same year house-furnishing goods in that index had .13% weight, but by 1925 so many more goods had been included in this group that its percentage weight had grown to 3.1%. It will be observed from the table that the goods in the Melbourne groups III., IV., and VI., which are mostly composed of those which rise very much in price in droughts, had in 1915 in the United States index only 38.84% weight instead of the much higher figures in the Melbourne and Sydney indexes.

The overweighting of agricultural and dairy products and meat in the Melbourne index suggests that the index is too high in the drought years 1908, 1912 and 1915, and that the Melbourne index would err in this respect more than the Sydney one. Let us consider in more detail the movements of the Melbourne general index and group indexes. From 1907 to 1908 group I. index fell nearly ½%, and would have fallen further but for the large weight given to coal, which rose in price; group II. index fell over 11%, group V. rose only 2%, group VII. fell over 3%, group VIII. fell over 7%, and an index based on the group aggregates of these groups in the published Melbourne index fell nearly 4%. In spite of this, the published Melbourne general index registers a rise of 9% because of the large rise in the prices of agricultural and dairy products and the smaller one in the price of meat. From 1911 to 1912 group I increased 2%, group II. fell 1%, group V. increased 5%, group VII. increased 6%, and group VIII. fell 2%, but the large increase in group III. index of 37%, in group IV. of 21%, and in group VI. of 36%, carried the general index upwards to a level 17% above the 1911 index. From 1914 to 1915 there were huge increases in groups III., IV., and VI., and

only comparatively small increases in the other groups except group II., which showed a fall, while from 1915 to 1916 there were large increases in groups I., II., V., VII., and VIII., a smaller rise in the meat group and a fall only in the agricultural and dairy products groups, yet the general index was carried to a very high level in 1915 by the increase in the prices of agricultural and dairy products and meat, and dragged down in 1916 by the fall in the prices of agricultural and dairy products.

The overweighting of agricultural and dairy products and meat explains what must have surprised some investigators, namely, the large rise in the Melbourne and Sydney indexes from 1907 to 1908, when the published wholesale prices indexes in Britain, the United States, Canada, New Zealand, France, Italy, Germany and Belgium, all gold standard countries at that time, as well as Australia, showed a fall. It also explains the fall in the Melbourne index from 1915 to 1916, when groups I., II., V., VI., VII., and VIII. all rose, and when a number of other statistical series suggested a rise in the price level. (Table 13). The Melbourne annual index fell about 7% from 1915 to 1916, but the quarterly index fell much more; the latter fell about 18% from the third quarter of 1915 to the second quarter of 1916. The contrast between the movements of the Melbourne and Sydney indexes from 1907 to 1908 and the other periods and the movements of the indexes in other gold standard countries would be still more noticeable if a comparison could be made by means of monthly instead of annual indexes. The Sydney index did not rise as high in 1915 as the Melbourne index, and did not show a fall from 1915 to 1916. The reason for this is mainly that the prices of agricultural products did not rise as high in Sydney in that year as in Melbourne, but it is partly due to the smaller weight given to agricultural products in the Sydney index. If the Sydney index for 1915 is recalculated with the Melbourne prices for hay, chaff, flour and wheat substituted for the Sydney prices, the group index for agricultural products in the Sydney index on the 1911 base becomes 2013 instead of 1648. That is, it becomes nearly as high as the Melbourne index for agricultural products for 1915, which is 2162. The published general index for Sydney for 1915 is 1401. If the prices of hay, chaff, flour and wheat had been the same in that year in Sydney as they were in Melbourne the general index for Sydney would have been 1477, which is nearly as high as the published index for 1916, namely 1489. The Sydney is definitely superior to the Melbourne index in that the former exaggerates less the rise in the price level from 1907 to 1908, from 1911 to 1912, and from 1914 to 1915.

A comparison of the actual changes in price of the commodities included in the Melbourne index shows that the commodities which rose in price by more than 5% from 1907 to 1908 were chiefly the ones in the three groups, agricultural and dairy products and meat. The only others which rose by more than 5% from 1907 to 1908 were currants, salmon, fine salt, rock salt, blue, matches, kerosene, shelving and cement. From 1915 to 1916 it was generally the same ones which fell in price, namely, all agricultural products, butter, lard, eggs, beef and macaroni, fine salt, matches, cement and cream of tartar. An examination of the cost of the mass units of the commodities in the Melbourne index makes it evident that the commodities which were chiefly influential in causing the rise in the Melbourne index from 1907 to 1908 and the fall from 1914 to 1916 are just the ones which rise very much in price in serious drought.

Table 13 shows the other statistical series mentioned above. Bank notes, bills in circulation, and Sydney and Melbourne bank clearings show a distinct falling off in business in 1908. The circulation of Commonwealth notes at the end of June, 1916, the bank bills in circulation and bank clearings in Sydney, Melbourne, Adelaide and Brisbane suggest a rise in the price level from 1915 to 1916.

TABLE 13.

Year.	Melbourne Index as published in "Labour Reports Nos. 6 and 17."	Sydney Index as published in "N.S.W. Year Book for 1921," and "Stat. Bulletin," Mar., 1927.	Notes in Circulation	Bills in Circulation, Australian Joint Stock Banks.	Total Bank Clearings in Melbourne and Sydney.	Total Bank Clearings in Melbourne, Sydney, Adelaide and Brisbane.
			£m	£000	£m	£m
1906	948	955	3.2	568	441	—
1907	1021	1001	3.56	802	471	—
1908	1115	1085	3.54	708	449	—
1909	993	1014	3.51	721	485	—
1910	1000	997	3.75	822	535	—
1911	1000	1000	3.72	929	594	—
1912	1170	1129	9.5	1002	634	782
1913	1088	1092	9.2	872	646	802
1914	1149	1137	9.6	1065	653	808
1915	1604	1401	32.1	1112	657	814
1916	1504	1489	44.6	1234	780	952

Note: All the banking statistics are taken from the Commonwealth Finance Bulletins, except total bank clearings for Melbourne and Sydney for the years 1906 to 1909, which were taken from the Australian Insurance and Banking Record. The notes in circulation up to 1911 are the notes of the Australian Joint Stock Banks, and from 1912 onwards Commonwealth notes.

Of course, as Mitchell points out in *Bulletin No.* 284, p. 111, it is not inevitable that the wholesale price level should always fall in periods of trade depression; it may be added here that it is probably not inevitable that the Australian wholesale price level should always fall when the wholesale price level falls in other gold standard countries, but we cannot be sure whether it does or not until we have a reliable index in which agricultural and dairy products and meat are properly weighted. If such a wholesale prices index in Australia is found to rise in a period of depression caused by a drought, then it is all the more important that there should be developed in Australia a wholesale prices index number which can act as one of the indicators of general business conditions, rising when business in general is prosperous and falling when depression sets in. In the United States the general wholesale prices index of the Bureau of Labor Statistics, and in Britain the Board of Trade wholesale prices index number, rise in periods of booming trade and fall in periods of trade depression. One could be made to act thus in Australia by excluding all products which rise in price in times of drought. Another kind of index number of wholesale prices which is of special interest to arbitration courts is one based solely on commodities which are among the first to increase in price in a trade boom and among the first to fall in price in depression. This kind of index number might be very useful as one of a number of series of economic statistics which help to forecast general changes in business prosperity.

It is obvious from the foregoing examination of the Melbourne and Sydney indexes that they should be improved in the direction of decreasing the weight of those goods which rise very much in price in drought periods, and in the direction of giving greater percentage weight to manufactured goods.

In the *Report of the Conference of Statisticians of Australia and New Zealand*, of August, 1926 (Government Printer, Perth, 1926), there is a resolution that for the purposes of a wholesale price index for each capital city of Australia the method now employed for the Melbourne index be adopted with certain amendments indicated. These amendments were that the Commonwealth Statistician in consultation with the Acting Statistician of New South Wales was to prepare an amended regimen. This resolution may cover the most thorough overhaul of the principles of compiling and weighting a general wholesale prices index and the most radical alterations in the Melbourne index. This chapter is devoted to suggesting the kind of alterations required.

The other resolution in the report to which attention may be drawn is of little utility without some alteration of the regimen and the system of weighting in the Melbourne index. The resolution referred to was "that the eight groups into which the regimen is now divided be retained, but that these be combined to form two sections, the present groups I., II., VII., and VIII. forming a section of producers' goods, and the present groups III., IV., V., and VI., forming a section of consumers' goods. . . ." If this consumers' goods index number for Melbourne is calculated without any change in the regimen, then in an index, supposedly by its title meant to represent the change in the price level of consumers' goods generally, the three groups, agricultural and dairy products and meat, would have in the 1915 index a total percentage weight of 85.2, which is far too great, while foods in this index for the same year would have 94.6% weight. The only non-foods in this index would be tobacco, kerosene, candles, matches, blue and starch, and they would have in the 1915 index only 5.4% weight. Even in a more normal year like 1914 the non-foods in the index have only 7.5% weight. It can be readily seen that if there were no great changes made in the system of weighting, this consumers' goods index would be merely a wholesale food prices index. But it would not even be a human food prices index because the following commodities, hay, chaff, straw, feed barley, bran and pollard, have 31.5% weight in the 1915 index. Such commodities are really producers' goods and should not appear in a consumers' goods index. If these commodities were simply excluded from the index it would not be enough improvement to make the index fairly representative of the price changes of consumers' goods, because even after this improvement meat would have 30.5% weight in the index for 1915, and foods as a whole 92.1%.

Then as to the producers' goods index, if the regimen were not altered radically, it would have at least one obvious fault in that raw cotton would be very much overweighted. The raw cotton used in Australia is negligible, but in the year 1915 raw cotton in this index would have 16% weight, and in the year 1910 as much as 25.8% weight. This would mean that the fall of 11.4% in the price of raw cotton from 1910 to 1911 would cause a fall of about 3% in the producers' goods index number and that the fall of 30% in the price of cotton from 1910 to 1912 would cause the producers' goods index to fall nearly 6%. Of course, other causes affect the level of the index number, but these figures show the amount of effect produced by the

movements in the price of raw cotton. To make either index a success a radical alteration of the sample of goods or regimen is necessary and a radical alteration of the system of weighting unless a very great number of new price quotations are obtained for manufactured products which are not foods.

It is work for a government department to collect new price quotations for a large number of manufactured commodities and to make sure that any changes in quality and importance are noticed and allowed for, but it is not so laborious to experiment with the existing Melbourne index to show how it registers in the drought years 1908, 1912 and 1915 and in other years also, when the percentage weight of agricultural and dairy products and meat is reduced.

The present writer has taken the trouble to calculate new index numbers of wholesale prices for Melbourne for the period 1906 to 1926, using 77 of the Melbourne wholesale price quotations published in the *Annual Labour Reports*, and interpolating prices for some years for which no quotations were given. For the price quotations used, the manner of making the interpolations and the results of the calculations, see Appendix K, which is designed to allow a reader to reconstruct the indexes and test the calculations and to find quickly the alterations produced by other systems of weights. Hay, chaff and straw were deliberately omitted from the new index numbers because of the great rise in their prices in years of drought and because commodities with this price behaviour can be sufficiently represented without them. Potatoes and onions were also omitted because of the large seasonal movement in their prices; a new potato and an old potato are virtually different commodities. Rock salt has been omitted partly because of some omitted quotations, but mainly because its price rises very much in times of drought. Twine, quicksilver, slates, caustic soda, potassium cyanide, alum, beeswax, tallow and malt were omitted because Melbourne price quotations have not been published in the *Labour Reports* for the years up to 1911; for some of them there were no price quotations published in the *N.S.W. Statistical Register*, and for others interpolations could not be satisfactorily made from the Sydney prices.

The extra price quotations used in the Melbourne index number after 1911, all except those deliberately excluded for some stated reason, could have been included in these new index numbers at any time after 1912. The Commonwealth Bureau of Census and Statistics did not publish price quotations for 1911 of the new commodities included in the index after 1911,

yet it had them and used them in the measurement of the price change from 1911 to 1912. Because of this omission it was impossible to use the new price quotations in the new indexes for the period 1911 to 1912, and as it was necessary to test the published indexes in this period to find out how much they exaggerated the rise in the price level from 1911 to 1912, this test had to be made with the index based on the 77 commodities. The writer then decided to omit the nine price quotations in question, namely those for twine, quicksilver, slates, caustic soda, potassium cyanide, alum, beeswax, tallow and malt, and to base the new indexes on 77 commodities throughout the period, for three reasons: First, the total percentage weight of these commodities in the Melbourne index is very small, being about 1% (actually in the Melbourne index in 1915 only 1.08%), so that if these commodities rose in price by 50% their rise would cause the general index to move only one-half of one per cent. There is no appreciable gain in including them, and the new indexes are practically the same as they would be if these commodities had been included. Second, the alteration of the number of commodities increases the complexity of the explanation of the alterations of the weights of several commodities and makes it harder for the general reader to understand the explanation and makes it somewhat more troublesome for the experienced reader to test the calculations. Third, the purpose of this chapter is not to compile a wholesale prices index number which should be copied by the Commonwealth Bureau of Census and Statistics, because it is very important to obtain more price quotations for manufactured commodities; the purpose is chiefly to criticise the existing one and to suggest the method which should be used in weighting an improved index of wholesale prices for Melbourne.

In the first index, No. 1 index, based on these 77 price quotations, the commodities have the same importance relative to each other as they have in the Melbourne index. The same mass units are used in multiplying the price quotations. The mass unit for each commodity is one ten-thousandth part of the estimated annual average consumption in the Commonwealth in the years 1906 to 1910 (*Labour Report*, No. 1, p. 20). But the omission of hay and chaff, and to a much smaller extent the omission of straw, potatoes, malt and onions, reduces the percentage weight of agricultural products and effects a considerable improvement in the Melbourne index, causing it to be much less distorted in the years 1908, 1912 and 1915, and makes

it show a rise of 7% from 1915 to 1916, instead of the fall of 7% in the annual averages of the Melbourne index.

But agricultural products, even in No. 1 index, still have 19% weight in 1915, while dairy products have 11.9% and meat 20.4%, all of which percentages are much too high. Also groups I. and II., or certain commodities in them, have in this index too much weight, for the index falls from 1918 to 1919, when the price level probably rose a few per cent. The next step was to reduce the weight of agricultural and dairy products and meat; various simple fractions of the aggregates of these groups were taken; the aggregates were reduced to one-half their previous size, then to one-third, then to one-quarter, and the aggregate of the meat group was finally reduced to one-eighth of its original size. That this reduction in the percentage weights of these products is not too great will be demonstrated in the three paragraphs following Chart 4. The reduction in the percentage weight of these groups of commodities had the effect of giving raw cotton, raw wool and coal too much weight. Consequently the mass units of cotton, wool and coal were reduced to one quarter of their original size. Index numbers Nos. 2 and 3 in Table 14 embody some of these alterations with one difference, that in No. 2 index the mass units of meat are reduced to one-eighth of their original size, whereas in No. 3 index they are reduced only to one-quarter. Otherwise in both indexes the mass units of coal, cotton, wool, agricultural and dairy products are reduced to one-quarter their original size. The changes made by these index numbers, which have been shown already to be improvements, are that the index numbers are practically the same for 1907 and 1908 (whereas the published Melbourne index errs in showing a large rise), they register a much smaller rise from 1911 to 1912 and 1914 to 1915 than the published index, and they show a considerable rise in the price level from 1915 to 1916. Another index, No. 4, which is the same as No. 3 index except that the mass units of cotton and wool are divided only by one-half, actually registers a fall of .8% from 1907 to 1908, which is just as likely to be an exact measurement as the measurements of indexes Nos. 2 and 3.

These three indexes have one common fault: they all show a fall from 1918 to 1919, at a time when the statistical series mentioned in Table 13 all indicated a rise (See *Commonwealth Finance Bulletins*). This is largely because metals have too much weight and because they fell greatly in price after the war demand ceased. The real remedy for this fault would be

to obtain price quotations for a large number of metal products, some of which were not specially raised in price by war demands, and give them considerable representative weight. As it is, the only thing which can be done with the 77 price quotations used here is to reduce the percentage weight of metals. When their mass units are reduced to one-half, as in index No. 5, that index, which is the same as index No. 2 but for this change in the weight of metals, registers a rise of .6% from 1918 to 1919. Even in index No. 5 metals have too much weight. When the mass units of metals are reduced to one-quarter of their original size, as in index No. 6, that index registers a smaller rise in 1916, 1917 and 1918 than No. 5 index, and shows a rise of 2.3% from 1918 to 1919. No. 6 index is obviously less distorted than No. 5 index by the war demands for metals. Indexes No. 5 and 6 show the same improvement from 1907 to 1908, from 1911 to 1912 and from 1914 to 1916 as index No. 2, and they are both less distorted than No. 2 index during the war period and during 1919 by the effect on the prices of metals of the special war demands. Perhaps the slight rise of .4% and .7%, which indexes Nos. 5 and 6 register respectively from 1907 to 1908 is a fault as compared with No. 2 index, which registers a fall of .1%. One could not, however, be sure of this, and over the whole period indexes 5 and 6 may be considered better and index No. 6 the best of all.

It will be observed also that indexes Nos. 5 and 6 in 1926 are about 7% below the level of the published indexes for Melbourne and Sydney, taking the high indexes as 100%, and the other new indexes are nearly as far below the published indexes. This is probably another improvement in the new indexes. In favour of this opinion it may be mentioned that index No. 1 registers only 1711 for 1926, and it is obtained from the Melbourne index mainly by the omission of hay, chaff, straw and potatoes. It may also be mentioned that all the new indexes in 1926 show a percentage increase over the 1911 level which corresponds more closely to the percentage increase in the same period of the wholesale prices index of the United States Bureau of Labor Statistics, which was in 1926 62% above the 1911 level. (*Monthly Labor Review*, Feb., 1927, p. 167.) This second remark does not add very much weight to the opinion, but it is interesting in view of the measurement of index No. 1. It may also be observed that the reducing of the mass units of groceries and building materials to one-half their original size does not affect the 1926 level of No. 5 index, which becomes as a result of this change 1707 instead of 1708.

The six new indexes are shown in Table 14 along with the published Melbourne and Sydney indexes, and in Chart 4 the published indexes and three of the new indexes, Nos. 1, 2, and 6. Index No. 5 is very close to index No. 6, except during the years 1916 to 1919. Index Nos. 2, 3, and 4 are close together except during 1921, when No. 4 was specially depressed by reason of the greater weight given to cotton and wool, and in 1923 and 1924, when No. 4 index was specially raised because of the greater weight given to cotton and wool and their high prices in those years.

CHART 4.

GRAPHS OF FIVE OF THE INDEXES OF TABLE 14.

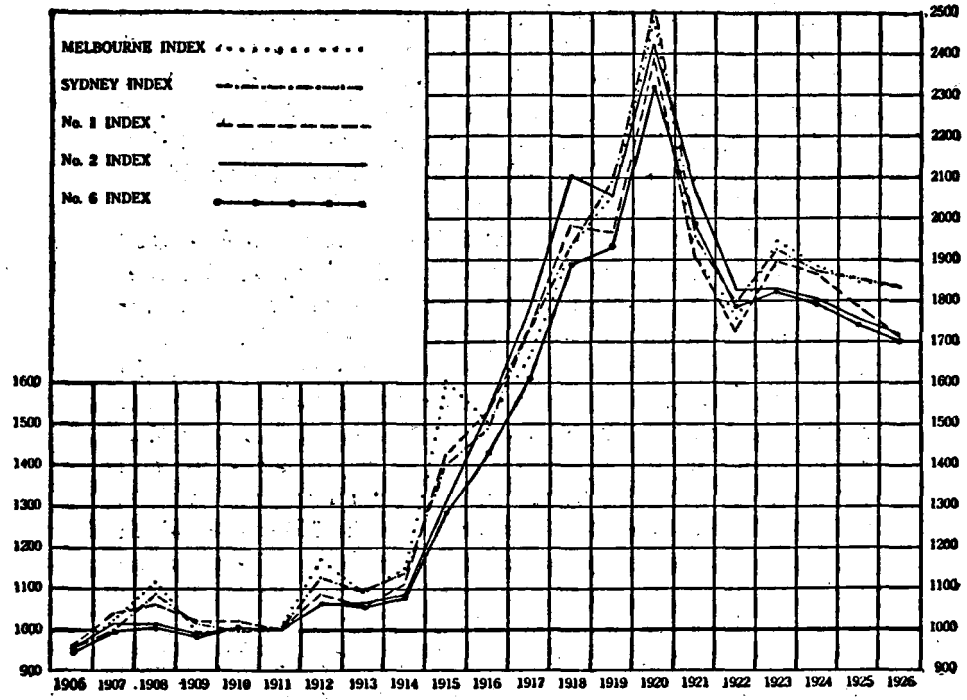


TABLE 14.

	Melbourne Index as published in Labour Reports, Nos. 8 and 17.	Sydney Index as published in the "N.S.W. Year Book for 1921" and the "N.S.W. Statistical Bulletin" for March, 1927.	No. 1 Index. A new Index, based on price quotations for 77 commodities, with the same mass units as in the Melbourne Index.	No. 2 Index, based on No. 1 Index, but with the mass units of coal, cotton, wool, and the goods in Groups III. and IV. divided by 4, and the mass units of meat divided by 8.	No. 3 Index, the same as No. 2, except that the mass units of meat are divided by 4 instead of by 8.	No. 4 Index, based on No. 1 Index, but with the mass units of coal and the goods in Groups III., IV. and VI. divided by 4 and the mass units of cotton and wool divided by 2.	No. 5 Index, the same as No. 2 Index, except that the mass units of metals are divided by 2.	No. 6 Index, the same as No. 3 Index, except that the mass units of metals are divided by 4.
1906	948	955	958	954	959	957	947	943
1907	1021	1001	1037	1013	1021	1017	1004	999
1908	1115	1085	1061	1012	1022	1009	1008	1006
1909	993	1014	1019	989	992	984	987	985
1910	1000	997	1021	1006	1006	1013	1006	1006
1911	1000	1000	1000	1000	1000	1000	1000	1000
1912	1170	1129	1086	1061	1070	1050	1062	1063
1913	1088	1092	1056	1063	1068	1053	1059	1058
1914	1149	1137	1111	1086	1098	1077	1081	1078
1915	1604	1401	1426	1309	1342	1297	1293	1286
1916	1504	1489	1529	1528	1557	1523	1465	1430
1917	1662	1727	1725	1781	1799	1799	1668	1606
1918	1934	1933	1983	2105	2114	2134	1965	1888
1919	2055	2090	1968	2057	2065	2066	1976	1931
1920	2480	2503	2387	2420	2445	2433	2355	2319
1921	1903	1956	1911	2065	2068	1991	2014	1986
1922	1758	1800	1729	1826	1825	1797	1801	1787
1923	1944	1925	1898	1830	1852	1863	1825	1822
1924	1885	1874	1868	1806	1819	1854	1798	1794
1925	1844	1854	1789	1759	1773	1770	1748	1742
1926	1832	1834	1711	1720	1726	1698	1708	1702

Let us now examine the actual percentage weights of agricultural and dairy products and meat in the new index numbers in order to be sure that they have not been too much reduced in weight. The percentage weight of meat has been more reduced in No. 2 index than in any of the other new indexes. In it the percentage weight of agricultural and dairy products is nearly as low as in indexes Nos. 3 and 4. In 1915, for example, agricultural products have 10.5% weight in No. 2 index, 9.9% weight in No. 3 index, and 9.4% weight in No. 4 index. In all these indexes agricultural products would have nearly 12% weight, and in No. 2 index probably rather more than 12% weight in the index for the third quarter of 1915 if that were calculated, but the writer could not calculate it because the price quotations for that quarter have not been published. The third quarter of 1915 was the quarter in which the general Melbourne wholesale prices index rose highest of the four quarters of that year, and since the rise in the price of agricultural products was the cause of most of the rise in the index, their prices must have been so high in that quarter as to cause the percentage weight of group III. in index No. 2 to be probably over 12%, and in indexes Nos. 3 and 4 to be nearly as great as 12%. In index No. 6 even at 1915 average prices agricultural products 11.8% weight, and in No. 5 index 11.3%. In all these index numbers agricultural products are sufficiently weighted; this opinion, of course, depends on the calculations in Appendix J in the same way as the following opinions about the weighting of the other commodities in the wholesale prices index.

Dairy products are possibly even a little overweighted since they have a weight in 1916 of 6.6% in index No. 2, 6.2% in index No. 3, and 5.9% in index No. 4, 7.1% in index No. 5, and 7.4% in index No. 6, but a small error in weight is not so important in this case as dairy products do not fluctuate in price quite so violently as agricultural products.

In index No. 2 meat is quite sufficiently weighted. Its percentage weight in the annual index numbers varies from 2.9 in the lowest year, 1922, to 5.6 in the highest year, 1915. But in the month of August of 1923 the index number for the meat group in the Melbourne index rose to 277% above the 1911 level, and in that month the meat aggregate would have about 6.3% weight in No. 2 index, which is probably as much weight as meat should have in a general wholesale prices index number. (See Appendix J.) In index No. 5 meat has rather more weight, having 6.1% in 1915, while in the same year in

index No. 6 it has 6.4% weight. In the month of August, 1923, meat would have about 6.8% and 7% weight respectively in indexes Nos. 5 and 6.

Table 15 shows the percentage weight of the various groups in the six new indexes in the year 1915, a drought year, in which the annual indexes had the highest percentage weights of the period considered for agricultural products, dairy produce and meat.

TABLE 15.

Percentage weights in 1915 *of the groups in the Melbourne and Sydney indexes and in the new indexes of wholesale prices for Melbourne. The groups are numbered as in the Melbourne index.*

	Melb. Index.	Sydney Index.	No. 1 Index.	No. 2 Index.	No. 3 Index.	No. 4 Index.	No. 5 Index.	No. 6 Index.
Group I.	10.98	12.7	14.5	19.5	18.4	17.5	12.8	9.0
Group II.	10.85	10.2	13.8	12.6	11.9	16.6	13.7	14.2
Group III.	38.15	25.2	19.0	10.5	9.9	9.4	11.3	11.8
Group IV.	8.99	9.4	11.9	6.6	6.2	5.9	7.1	7.4
Group V.	10.88	13.9	14.4	31.7	30.0	28.4	34.4	35.8
Groups VI.	15.3	18.0	20.4	5.6	10.7	10.1	6.1	6.4
Group VII.	4.29	9.9	5.6	12.4	11.7	11.1	13.4	14.0
Group VIII.	.59	.8	.5	1.1	1.1	1.0	1.2	1.3
Total	100.0	100.1	100.0	100.0	99.9	100.0	100.0	99.9

The number of commodities in the Sydney and Melbourne indexes is too small and there is too little representation of manufactured goods to permit of a wholesale prices index being made for Australia in which one could have much confidence, both in normal and abnormal periods, and which would have an error of not more than 2% or 3% due to sampling. Even in the two best of the new indexes, Nos. 5 and 6 metals and coal, the goods in group II., groceries and building materials, are given very much more percentage weight than they themselves have in total wholesale trade. Only the commodities which offended most conspicuously by their violent price fluctuations were singled out for reduction of their mass units, and the others were given large representative weight on the principle suggested by Edgeworth that not too much weight should be given to commodities in a sample which fluctuate much more in price than the average. In view of this, the new indexes Nos. 5 and 6 are not set forth as final and worth compiling by the Commonwealth Bureau of Census and Statistics, but mainly as illustrations of the kind of improvement which can be made in the existing Melbourne and Sydney indexes. However, if it proved impossible to incur the expense of a thorough remodel-

ling of the Melbourne index, either index No. 5 or index No. 6, with a few more adjustments, would be well worth substituting for the present index, but preferably No. 6. The extra commodities for which price quotations are now obtainable in Melbourne could easily be included in these indexes, and others could be added without trouble from time to time.

It should not be difficult to make for Australia a wholesale prices index which would possess the characteristic of rising when industry in general is prosperous and employment good, and falling when industry is depressed and employment decreases. It would act as a kind of rough "thermometer" of business, indicating the state of business activity. An index based on the prices of metals, jute goods, leather, building materials, possibly wool, and a number of other manufactured or semi-manufactured commodities for which price quotations could be obtained, should serve this purpose quite well. It could be tested by means of good unemployment statistics as soon as they are available to find out how efficient it would be as a "thermometer" of business activity. The curve of its rate of change from month to month might help in predicting movements in business activity and unemployment. The examination to find such an index might also reveal a sufficient number of commodities which usually rise early in price in boom periods and fall early enough in price in times of depression to form the basis of another wholesale prices index number which would forecast the movements of the "thermometer" index number by a month or two.

APPENDIX A.

The cost, at the base periods, of the mass units of the commodities included in the retail prices index numbers published by the Commonwealth Bureau of Census and Statistics. The mass unit of each commodity is one-millionth part of the estimated annual average consumption of that commodity in the Commonwealth in the period 1906 to 1910.

TABLE 1.

Aggregate cost of the mass units of the commodities included in the food, groceries and housing (4 and 5 rooms) index number of retail prices, at the average prices in the six capital cities in 1911. *Figures supplied by the Commonwealth Statistician to the Queensland Registrar-General.*

	d.	% of total.
Cost of the mass units of groceries	56,812	28.4
Cost of the mass units of dairy produce	35,050	17.5
Cost of the mass units of meat	33,003	16.5
Cost of the mass unit of housing (at average rent of 4 and 5 roomed houses)	75,084	37.6
Aggregate cost	199,949	100.0

Note.—The average rent for one city is an average of the rent of two classes of houses in this index and of six classes in the all houses index, with the rent of each class weighted in accordance with the number of houses of that class in that city. (*Labour Report*, No. 1, p. 32.)

The average for the six capital cities is compiled in this way: The cost of the mass units of the goods in each group and for all groups is computed for each city and averages are computed for the six capital cities by weighting the aggregate cost in each city by a number or weight proportional to its population in 1911. (*Labour Report*, No. 1, p. 35.)

TABLE 2.

Aggregate cost of the mass units of the commodities included in the food, groceries, housing (all houses), clothing and miscellaneous index number of retail prices, at the average prices in the six capital cities in November, 1914. *Figures supplied by Commonwealth Statistician to the Queensland Registrar-General.*

	d.	% of total.
Cost of the mass units of food and groceries .	143,144	34.6
Cost of the mass unit of housing (at the average rent for all sizes of houses)	96,652	23.4
Cost of the mass units of clothing	100,329	24.2
Cost of the mass units of miscellaneous items	73,699	17.8
Aggregate cost	413,824	100.0

The Commonwealth Bureau of Census and Statistics housing (4 and 5 rooms) index number for 1924 for the six capital cities is 1615 on the 1911 base. If the cost of the mass unit of

housing (4 and 5 rooms) in 1911 (from Table 1 above) is increased in the proportion 1000 to 1615, we obtain a very close estimate of the average cost for the six capital cities in 1924 of the mass unit of housing (4 and 5 rooms), namely, 121,261d. The index number of housing (4 and 5 rooms) on the November, 1914, base is 1522 for the six capital cities in 1924. If we decrease 121,261d. in the proportion 1522 to 1000 we obtain 79,672d. as a very close estimate of the average cost of the mass unit of housing (4 and 5 rooms) in the six capital cities in November, 1914. This figure for housing was used in Appendix D for calculating the experimental index number of the cost of living. The writer has since obtained, through the courtesy of the Registrar-General of Queensland, the actual figure used in calculating the Commonwealth published index number of housing (4 and 5 rooms), namely, 79,640, which is shown in Table 3 below. The actual figure differs by only one twenty-fifth of one per cent. from the estimate used in Appendix D, that is, for practical purposes it is the same, and its substitution for the estimate would not affect the experimental index. Appendix D was therefore allowed to remain unaltered.

TABLE 3.

Cost of the mass units of the commodities included in the food, groceries, housing (4 and 5 rooms), clothing and miscellaneous index number at the average prices in the six capital cities in November, 1914.

	d.	% of total.
Cost of the mass units of food and groceries .	143,144	36.1
Cost of the mass unit of housing (at the average rent for 4 and 5 roomed houses)	79,640	20.1
Cost of the mass units of clothing	100,329	25.3
Cost of the mass units of miscellaneous items	73,699	18.1
Aggregate cost	396,844	100.1

APPENDIX B.

Interpolations in the housing (4 and 5 rooms) index for the six capital cities of the Commonwealth on the assumption that from November, 1915, to November, 1919, the average rent for 4 and 5 roomed houses was the same percentage above the November, 1914, level as the average rent for all houses, and that in May and August, 1922, and in the four quarters of the years 1923 to 1924, the average rent for houses with four or five rooms was the same percentage above the level of November, 1921, as the average rent for all houses.

	Average Rent (all houses) Index Number.	Average Rent (4 and 5 rooms) Index Number. Actual index numbers are shown for November in the years 1920, 1921 and 1922.
Nov., 1914	1000	1000
Nov., 1915	970	970
Nov., 1916	977	977
Nov., 1917	1000	1000
Nov., 1918	1054	1054
Nov., 1919	1125	1125
Nov., 1920	1243	1312
Nov., 1921	1287	1352
May, 1922	1332	1399
Aug., 1922	1342	1410
Nov., 1922	1356	1432
1st qr., 1923	1369	1438
2nd qr., 1923	1402	1472
3rd qr., 1923	1405	1476
4th qr., 1923	1411	1482
1st qr., 1924	1422	1494
2nd qr., 1924	1451	1524
3rd qr., 1924	1459	1533
4th qr., 1924	1469	1543

APPENDIX C.

This appendix shows how the New Zealand retail clothing prices index has been substituted for the Australian index, and how the arithmetical average of the New Zealand fuel and light and miscellaneous indexes (weighted thus: fuel and light, 5; and miscellaneous, 14) has been substituted for the Australian miscellaneous index in the calculation of the experimental index number of the cost of living in Appendix D.

Dates of New Zealand Indexes substituted for Commonwealth Indexes of the date opposite.	New Zealand Indexes substituted for corresponding Commonwealth Indexes.		Date of Australian Indexes.
	Clothing.	Average of miscellaneous and fuel and light (Appendix E).	
July, 1914	1000	1000	Nov., 1914
August, 1915	1091	1052	Nov., 1915
August, 1916	1279	1205	Nov., 1916
August, 1917	1529	1400	Nov., 1917
Av. of Aug., 1918, and Feb., 1919	1953	1725	Nov., 1918
Av. of Aug., 1919, and Feb., 1920	2299	1954	Nov., 1919
Av. of Aug., 1920, and Feb., 1921	2535	2239	Nov., 1920
Av. of Aug., 1921, and Feb., 1922	2145	2191	Nov., 1921
Av. of Feb., 1922, and Aug., 1922	1942	2044	May, 1922
August, 1922	1882	1954	Aug., 1922
Av. of Aug., 1922, and Feb., 1923	1841	1917	Nov., 1922
February, 1923	1799	1879	1st qr., 1923
Av. of Feb., 1923, and Aug., 1923	1786	1853	2nd qr., 1923
August, 1923	1773	1826	3rd qr., 1923
Av. of Aug., 1923, and Feb., 1924	1753	1840	4th qr., 1923
February, 1924	1733	1854	1st qr., 1924
Av. of Feb., 1924, and Aug., 1924	1710	1819	2nd qr., 1924
August, 1924	1687	1783	3rd qr., 1924
Av. of Aug., 1924, and Feb., 1925	1676	1767	4th qr., 1924
February, 1925 (Jan. figure)	1664	1751	1st qr., 1925
Av. of Feb., 1925, and Aug., 1925	1655	1746	2nd qr., 1925
August, 1925 (July figure)	1646	1740	3rd qr., 1925
November, 1925	1599	1711	4th qr., 1925
February, 1926	1573	1708	1st qr., 1926
May, 1926	1555	1736	2nd qr., 1926
August, 1926	1541	1753	3rd qr., 1926
November, 1926	1541	1753	4th qr., 1926
February, 1927	1519	1743	1st qr., 1927

APPENDIX D.

Tables showing the calculations for the experimental index number of the average change in the total cost of living in the six capital cities of Australia, base, November, 1914, equals 1000, and also experimental index numbers for Sydney and Melbourne for two periods. The base for the Sydney and Melbourne indexes is the same as for the index for the six capital cities, that is, 1000 represents the aggregate cost of the market basket in the six capital cities in November, 1914.

Assumptions.

1. That the percentage change from November, 1914, onwards in the retail prices of clothing in Sydney and Melbourne and in the average retail price level of clothing in the six capital cities in the Commonwealth was the same as the percentage change from July, 1914, onwards of the New Zealand clothing index of Appendix C.
2. That the percentage change from November, 1914, onwards in the retail price level of miscellaneous items of household expenditure in Sydney and Melbourne, and in the average retail price level of the same goods in the six capital cities was the same as the percentage change from July, 1914, onwards in the average of the New Zealand miscellaneous and fuel and light indexes shown in Appendix C.

TABLE 1. INDEX FOR THE SIX CAPITAL CITIES.

The aggregates for the base period are from information supplied by the Commonwealth Bureau of Census and Statistics, which compiled the Australian official retail prices index numbers (Appendix A).

The group aggregates for the other periods are found from the aggregates at the base period by means of the following index numbers of retail prices:

The food and groceries aggregates up to 1925 by means of the published Commonwealth food and groceries index, with the average cost in the six capital cities in November, 1914, as base equals 1000.

The housing aggregates up to 1925 by means of the published Commonwealth housing (4 and 5 rooms) index, with the average cost in the six capital cities in November, 1914, as base equals 1000. For interpolations see Appendix B.

The combined aggregates for food, groceries and housing for 1926 and the first quarter of 1927 by means of the published Commonwealth food, groceries and housing (4 and 5 rooms) index, with the average cost in the six capital cities in 1911 as base equals 1000.

The clothing aggregates by means of the New Zealand clothing index, as substituted for the Commonwealth one in Appendix C, base, November, 1914.

The miscellaneous aggregates by means of the average of the New Zealand fuel and light and miscellaneous indexes as substituted for the Commonwealth miscellaneous index in Appendix C, base, November, 1914.

The general index was then calculated from the totals of the group aggregates for the various periods, base, November, 1914.

	Nov., 1914.		Nov., 1915.		Nov., 1916.		Nov., 1917.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc.	143,144	1000	188,691	1314	181,363	1267	186,517	1303
Housing . .	79,672	1000	77,282	970	77,840	977	79,672	1000
Clothing . .	109,329	1000	109,459	1001	128,321	1279	153,408	1529
Miscellaneous	73,699	1000	77,531	1052	88,897	1206	103,179	1400
Total . . .	396,844	1000	452,963	1140	476,231	1200	522,771	1317

	Nov., 1918.		Nov., 1919.		Nov., 1920.		Nov., 1921.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc.	192,242	1343	229,090	1600	269,970	1884	212,139	1482
Housing . .	83,974	1054	89,631	1125	104,530	1312	107,717	1352
Clothing . .	196,943	1963	230,656	2299	254,334	2535	215,206	2146
Miscellaneous	127,131	1725	144,008	1954	165,012	2239	161,475	2191
Total . . .	599,290	1510	693,325	1747	793,846	2000	696,537	1755

	May, 1922.		Aug., 1922.		Nov., 1922.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc.	212,426	1484	216,004	1510	210,994	1474
Housing . .	111,461	1399	112,338	1410	114,090	1432
Clothing . .	194,839	1942	188,819	1882	184,766	1841
Miscellaneous	150,641	2044	144,008	1954	141,281	1917
Total . . .	669,367	1687	661,169	1666	651,071	1641

	1st Qr., 1923.		2nd Qr., 1923.		3rd Qr., 1923.		4th Qr., 1923.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc.	209,849	1466	227,456	1589	237,333	1658	226,740	1584
Housing . .	114,568	1438	117,277	1472	117,596	1476	118,074	1482
Clothing . .	180,492	1799	179,188	1786	177,883	1773	175,877	1753
Miscellaneous	138,480	1879	136,564	1853	134,574	1826	135,606	1840
Total . . .	643,389	1621	660,485	1664	667,386	1682	656,297	1654

	1st Qr., 1924.		2nd Qr., 1924.		3rd Qr., 1924.		4th Qr., 1924.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc.	222,016	1551	217,288	1518	212,998	1488	212,858	1487
Housing . .	119,030	1494	121,420	1524	122,137	1533	122,934	1543
Clothing . .	173,870	1733	171,563	1710	169,255	1687	168,151	1676
Miscellaneous	136,638	1854	134,058	1819	131,405	1783	130,226	1767
Total . . .	651,554	1642	644,334	1624	635,795	1602	634,168	1598

	1st Qr., 1925.		2nd Qr., 1925.		3rd Qr., 1925.		4th Qr., 1925.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc.	216,863	1515	222,732	1556	225,881	1578	225,881	1578
Housing . .	123,492	1550	123,731	1553	123,492	1550	124,209	1559
Clothing . .	166,947	1664	166,044	1655	165,142	1646	160,426	1599
Miscellaneous	129,047	1761	128,678	1746	128,236	1740	126,099	1711
Total . . .	636,349	1604	641,185	1616	642,751	1620	636,615	1604

	1st Qr., 1926.		2nd Qr., 1926.		3rd Qr., 1926.		4th Qr., 1926.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc. and Housing	351,110	1756	361,906	1810	353,110	1766	351,310	1757
Clothing . .	157,818	1573	156,012	1556	154,607	1541	154,607	1541
Miscellaneous	125,978	1706	127,941	1736	129,194	1753	129,194	1753
Total . . .	634,906	1600	645,861	1628	636,911	1606	635,111	1600

	1st Qr., 1927.	
	Aggregate.	Index.
F. and Groc. and Housing	348,111	1741
Clothing . .	152,460	1519
Miscellaneous	128,457	1743
Total . . .	628,968	1585

TABLE 2.

Experimental index numbers of cost of living for Sydney and Melbourne for November, 1920, and for the fourth quarter of 1926, with the average cost in the six capital cities in November, 1924, equals 1000.

Separate index numbers for food and groceries and for housing were used in compiling these indexes for the fourth quarter of 1926, instead of the combined food, groceries and housing index used in compiling the index for the six capital cities in Table 1. Otherwise the group aggregates are compiled in the same way as those in Table 1.

	Sydney.				Melbourne.			
	Nov., 1920.		4th Qr., 1926.		Nov., 1920.		4th Qr., 1926.	
	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.	Aggregate.	Index.
F. and Groc.	273,548	1911	232,466	1624	272,403	1903	215,718	1507
Housing . .	120,384	1511	137,355	1724	99,112	1244	128,033	1607
Clothing . .	254,334	2535	154,607	1541	254,334	2535	154,607	1541
Miscellaneous	165,013	2239	129,194	1753	165,012	2239	129,194	1753
Total . . .	813,278	2049	653,622	1647	790,861	1993	627,552	1581

APPENDIX E.

Two New Zealand retail prices index numbers (*Monthly Abstract of Statistics*) and an arithmetical average of them, with the miscellaneous index given a weight of 14 and the fuel and light index a weight of 5.

	Miscellaneous	Fuel and Light.	Average.
July, 1914	1000	1000	1000
Aug., 1915	1065	1017	1052
Aug., 1916	1221	1160	1205
Aug., 1917	1438	1293	1400
Aug., 1918	1753	1343	1645
Feb., 1919	1946	1410	1805
Aug., 1919	1997	1501	1866
Feb., 1920	2189	1625	2041
Aug., 1920	2317	1830	2189
Feb., 1921	2425	1907	2289
Aug., 1921	2343	1982	2248
Feb., 1922	2209	1924	2134
Aug., 1922	2016	1780	1954
Feb., 1923	1930	1735	1879
Aug., 1923	1861	1730	1826
Feb., 1924	1866	1822	1854
Aug., 1924	1799	1739	1783
Feb., 1925	1764	1716	1751
Aug., 1925	1743	1733	1740
Nov., 1925	1699	1743	1711
Feb., 1926	1688	1763	1708
May, 1926	1726	1763	1736
Aug., 1926	1747	1770	1753
Nov., 1926	1748	1769	1753
Feb., 1927	1734	1769	1742

APPENDIX F.

United States Bureau of Labor Statistics retail prices index numbers of house furnishings, fuel and light, and miscellaneous items (*Monthly Labor Review*, Feb., 1927, p. 181), and a simple arithmetical average of the three indexes.

		House furnishings.	Fuel and light.	Miscellaneous.	Simple arith. aver.
1913		100	100	100	100
Dec.,	1914	104	101	103	103
Dec.,	1915	110.6	101	107.4	106
Dec.,	1916	127.8	108.4	113.3	117
Dec.,	1917	150.6	124.1	140.5	138
Dec.,	1918	213.6	147.9	165.8	176
June,	1919	225.1	145.6	173.2	181
Dec.,	1919	263.5	156.8	190.2	204
June,	1920	292.7	171.9	201.4	222
Dec.,	1920	285.4	194.9	208.2	230
May,	1921	247.7	181.6	208.8	213
Sep.,	1921	224.7	180.7	207.8	204
Dec.,	1921	218.0	181.1	206.8	202
Mar.,	1922	206.2	175.8	203.3	195
June,	1922	202.9	174.2	201.5	193
Sep.,	1922	202.9	183.6	201.1	196
Dec.,	1922	208.2	186.4	200.5	198
Mar.,	1923	217.6	186.2	200.3	201
June,	1923	222.2	180.6	200.3	201
Sep.,	1923	222.4	181.3	201.1	202
Dec.,	1923	222.4	184.0	201.7	203
Mar.,	1924	221.3	182.2	201.1	202
June,	1924	216.0	177.3	201.1	198
Sep.,	1924	214.9	179.1	201.1	198
Dec.,	1924	216.0	180.5	201.7	199
June,	1925	214.3	176.5	202.7	198
Dec.,	1925	214.3	186.9	203.5	202
June,	1926	210.4	180.5	203.3	198
Dec.,	1926	207.7	188.3	203.9	200

APPENDIX G.

Number of persons engaged, horse-power of engines used, and horse-power of engines used per person engaged in "factories" in the Commonwealth (*Production Bulletins*).

In All Factories.

	Persons engaged.	Horse-power of engines used.	Horse-power of engines used per person engaged.	Index.
1911	311,710	343,550	1.005	1,000
1924-5	439,949	1,260,076	2.864	2,850
1925-6	450,920	1,335,202	2.961	2,946

In All Factories, Except the Heat, Light and Power Group.

	Persons engaged.	Horse-power of engines used.	Horse-power of engines used per person engaged.	Index.
1911	304,059	230,624	.758	1,000
1924-5	426,214	613,471	1.439	1,898
1925-6	439,386	668,526	1.522	2,008

APPENDIX H.

Simple arithmetic averages of the hours of labour in certain manufacturing industries in the six capital cities in the Commonwealth (*Labour Reports*), and an average for all manufactures weighted according to the number in each industrial group in the Commonwealth at the 1911 Census. (See *Labour Report No.* 2, pp. 22 and 23, for the explanation of the weights.)

	Weights from "Labour Rep., No. 5," p. 45.	Hours, 30th April, 1914.	Hours, 31st Dec., 1925.
I. Wood, furniture, etc.	435	47.78	45.98
II. Engineering, metal works, etc.	606	47.79	47.50
III. Food, drink, etc.	561	49.18	46.40
IV. Clothing, boots, etc.	231	47.90	45.56
V. Books, printing, etc.	169	46.27	44.79
VI. Other manufactures	400	48.14	47.06
Average weighted with above weights		48.07	46.52
Index based on general average		1000	968
Simple arithmetic average of the averages for the six groups		47.84	46.22
Index based on the simple averages		1000	966

APPENDIX I.

Table showing a certain misleading index number of the physical volume of production in manufacturing industry in the Commonwealth, with the materials for its compilation.

Value added, in the later *Production Bulletins* of the Commonwealth Bureau of Census and Statistics, is taken to be the value of output minus the value of materials and fuel and light used in production.

Only factories using power or employing four or more hands are included in the statistics in the *Production Bulletins*.

	Value added, "Prod. Bul. No. 20."	Hands employed (including working proprietors, ("Prod. Bulletins").	Value added per person engaged.	Index of value added per person engaged.	Misleading manufacturing production prices index, "Commonwealth Production Bulletin, No. 20."	Misleading ind. of vol. of prod. per person engaged in manufacturing in Commonwealth, (4) ÷ (5) × 1000.
	(1)	(2)	(3)	(4)	(5)	(6)
	£000		£			
1908	33,956	257,494	131.9	865	886	976
1909	36,913	266,661	138.4	907	917	989
1910	42,442	286,928	147.9	970	977	993
1911	47,531	311,710	152.5	1,000	1,000	1,000
1912	53,401	327,456	163.1	1,069	1,056	1,012
1913	57,674	337,101	171.1	1,122	1,096	1,024
1914	59,004	331,728	177.9	1,166	1,128	1,034
1915	59,212	321,071	184.4	1,209	1,153	1,049
1916	60,502	316,752	191.0	1,252	1,181	1,060
1917	65,327	321,670	203.1	1,332	1,270	1,049
1918	70,087	328,049	213.6	1,401	1,328	1,055
1918-19		340,475				
1919-20	92,330	376,734	245.1	1,607	1,529	1,051
1920-21	101,778	386,639	263.2	1,726	1,666	1,036
1921-22	112,517	395,425	284.5	1,865	1,788	1,043
1922-23	123,188	412,410	298.7	1,959	1,849	1,059
1923-24	132,732	429,990	308.7	2,024	1,881	1,076
1924-25	137,977	439,949	313.6	2,056	1,904	1,080
1925-26	143,256	450,920	317.7	2,083	1,921	1,084

APPENDIX J.

Rough estimates of the relative importance in wholesale trade of the groups of commodities in the Melbourne wholesale prices index number.

Group I.—Metals and Coal.

Group I. in the Melbourne index includes only metals and coal, and the title claims no more; and if it is not to be considered representative of the price movements also of metal products, the commodities in this group are already overweighted. It is certain also that the price movements of metals, although in the same direction usually as the price movements of metal products, are much greater, but to counteract this the price of coal is more steady. The annual average price of coal quoted in the *Labour Reports* shows a steady rise during the whole period 1906 to 1926. There is something to be said for the view that in normal times, in the absence of price quotations for a number of metal products, the group I. commodities should be considered to represent the price movements of metal products better than primary products or building materials or chemicals or groceries. In the abnormal war period and in the year 1918 to 1919 the metals in group I. fluctuated in price more than metal products as a whole. Of course, if price quotations could be obtained for metal products, it would be a very great improvement to give the extra representative weight to them even if their own relative importance in wholesale trade were not very large.

The total value of output of the metal works and machinery group of "factories" in the Commonwealth in 1924-5 was £m. 76, the total value of imports of metals and machinery £m. 46, and the total value of mineral production £m. 25. Imports of minerals were negligible for this purpose. These three items above total £m. 147, which is 17.5% of £m. 840. There should be in the index number goods with about this percentage weight to represent the price movements of this important group of commodities, but group I. commodities have only 11% weight in the Melbourne index for 1915. Coal, however, should not be increased in weight; in fact, unless it can be shown to represent fairly well the price movements of omitted commodities its percentage weight should be reduced, because only £m. 11.6 of coal was produced in the Commonwealth in 1924-5, which is only 1.4% of £m. 840.

Group II.—Textiles, Leather, Etc.

Textiles, leather, etc., forms the title for group II. in the Melbourne index in the table at the end of the *Labour Reports* giving the average annual price quotations, but the only textiles included are branbags, cornsacks and woolpacks. The other commodities included are raw cotton and wool (presumably set there mainly to represent cotton and woollen textiles, because the production and imports of raw cotton are negligible), three kinds of

leather, and twine and tallow. The following table shows an attempt to estimate for the Commonwealth the total value of output plus imports of the commodities supposed to be represented in the Melbourne index, group II., with the idea of comparing the amount with the £m. 840, which is a rough estimate (or rather underestimate), of the total value of output plus imports:

Australian Commonwealth, 1924-5.
(*Production Bulletin and Overseas Trade Bulletin.*)

	£m.
Value of wool produced	76.3
Imports of wool	.3
Value of raw cotton produced negligible.	
Imports of raw cotton	.1
Value of output of certain groups of "factories"—	
Boiling down, tallow refining and bone milling	1.6
Tanneries	5.2
Wool scouring and fellmongering	8.3
Leatherware	1.4
Boots and shoes	9.8
All textiles, ropes, bags, tents, etc.	35.3
Value of imports of leather goods	.6
Value of imports of textiles	42.3
Total value of output, plus imports of the goods supposed to be represented in Group II. of the Melbourne index	181.2

£m. 181.2 is 21.6% of £m. 840, and wool production plus imports 9.1%. A similar calculation for the United States for the year 1919, using the statistics in the *Abstract of the* 1919 *Census* for production and *Statistical Abstract for* 1919 for statistics of imports, gives 15.3%. That is, in the United States in 1919 the output of the goods supposed to be represented in the Melbourne index, group II., in the factories included in the Census investigation (those with an output of less than 500 dollars were excluded) plus the imports of the same commodities were valued in those statistical publications at 13,880 million dollars, which is 15.3% of the rough underestimate given in chapter V. of the total value of output plus imports in the United States in 1919.

Group III.—Agricultural Produce.

The value of production in Agriculture in the Commonwealth in 1924-5 was £m. 107.1; this plus the value of the imports of the principal agricultural products (*Production Bulletin*) £m. 9.6, is still only 14% of £m. 840. If we subtract from the £m. 116.7 and the £m. 840 half the value of hay produced in that year the percentage agricultural products forms of the other is just 13%. Certain proportions of such products as straw, maize and barley are also consumed on the farms, and the value of wholesale trade is sure to be more than £m. 840. Bearing these facts in mind, along with the general principle of not giving too much weight to commodities which fluctuate abnormally in price, we should have no hesitation in concluding that even in drought periods, when prices are high, agricultural products in the index number should not have as great a weight as 12%. Yet in the Melbourne index for 1915 this group of products has 38% weight, and in the Sydney index 25%.

Group IV.—Dairy Produce.

The total value of production of dairy produce as estimated in the *Commonwealth Production Bulletin* was, in 1924-5, £m. 45, and total imports £168,755. £m.45 is only 5.4% of £m. 840, but these products have 9% weight in the Melbourne index for 1915, which is clearly too much, unless we know that the price movements of dairy products are similar to the price movements of other commodities which are excluded from the index number.

Group V.—Groceries.

One way of making a rough guess at the percentage weight in wholesale trade of this group of commodities is to take the total value of output in the "factories" in the food and drink group of the *Production Bulletin*, and subtract the value of the output of bacon, butter, cheese and condensed milk and malt, and the value of the output of flour mills, because these products are included in groups III. and IV. This leaves £m. 76.7. If we add to this the total value of imports of tobacco and its preparations and of spirituous liquors and of foods stuffs of vegetable origin (this last item contains only negligible quantities of group III. products), the total £m. 87.7 is only 10.4% of £m. 840. The groceries group should not have more weight than about 10%, unless the price movements of the goods included can be considered representative of the price movements of goods excluded. This group of commodities has 11% weight in the Melbourne index for 1915.

Group VI.—Meat.

An estimate is given in *Labour Report No.* 1 of the annual average consumption of beef, veal, mutton, lamb and pork in the Commonwealth in the period 1906 to 1910, pp. 20, 44 and 45, as follows:

Beef	390 m. lbs.
Veal	20 m. lbs.
Mutton	330 m. lbs.
Lamb	56 m. lbs.
Pork	37 m. lbs.

The actual figure for lamb in *Labour Report No.* 1, p. 45, is 2,000,000 lambs, but this was, after 1914, taken to be equivalent to 56,000,000 lbs. This shows the amount of veal to be about 1/21 of the total consumption of beef and veal, and the amount of lamb to be about 1/7 of the total consumption of mutton and lamb. We can use these proportions in estimating roughly the amount of beef and veal in the estimate given in the *Year Book for* 1926, p. 608, of the annual average Commonwealth production in the years 1922-3 to 1924-5 of beef and veal, and the amount of mutton and lamb in the estimate of the annual average annual production of mutton and lamb in the same period, given on p. 614, and in calculating from these estimates the value of the annual average production of meat in that period at the wholesale prices given for Melbourne for 1924 in the 1924 *Labour Report*. This will give us a figure

which we can compare with the rough estimate of the value of output plus imports in the Commonwealth in the year 1924-5, namely, £m. 840. In this way we may obtain a rough notion of the percentage weight which should be given to meat in the Melbourne wholesale prices index number.

	m. lbs.	Average price per lb. in Melbourne in 1924. d.	Value of average annual production, 1922-3 to 1924-5, at Melbourne, 1924, prices. £m.
Estimate of the annual average Commonwealth production of beef and veal, 1922-3 to 1924-5	1090		
20/21 of this assumed to be beef ..	1038	3.84	16.6
1/21 of this assumed to be veal	52	3.75	.8
Estimate of the annual average Commonwealth production of mutton and lamb, from 1922-3 to 1924-5 ..	459		
6/7 of this assumed to be mutton	393	6.0	9.8
1/7 of this assumed to be lamb	66	8.625	2.4
As can be seen from the table in Appendix K, the cost of the mass unit of pork in 1922 and in 1926 was nearly as great as that of lamb; there is no large error in assuming that the value of pork produced was as great as the value of lamb produced.			
Therefore £m. 2.4 is set down as a rough guess of the value of pork produced on the average in the years 1922-3 to 1924-5			2.4
Total			32.

This £m. 32 is 3.8% of £m. 840. These two figures do not apply to the same period, but the periods are near enough to give us a notion of the relative size of the two quantities in the same period. They suggest that meat in an Australian wholesale prices index number should not have more weight than about 3.8% on its own account.

The prices of cattle and beef in the United States from 1890 to 1925 fluctuated in much the same way; the price movements of hogs and pork were very similar; a glance at charts 8 and 9 in the *United States Bureau of Labor Statistics' Wholesale Prices Bulletin No.* 415 shows this conveniently. A comparison of the price relatives for wethers and ewes (p. 50) with the price relative for dressed mutton (p. 74) shows that, while the movements of the prices of sheep and mutton were not so much alike as the movements of the prices of meat and cattle, yet there was sufficient resemblance to justify us in considering meat and live stock to be in the same price behaviour group in

the United States. It is very probable that the same holds for Australia. If no price quotations are available for live stock, it is suitable to add some percentage weight to meat as representative of live stock.

It is easier to make an estimate of the total value of meat sold plus the total value of live stock sold for the United States than for Australia, because, in the *Abstract of the* 1919 *Census*, there is given an estimate of the value of all domestic animals sold or slaughtered on farms in the United States in 1919, namely, 3,511 million dollars (p. 807). Of the 92,000,000 animals represented by the 3,511 million dollars, 20% were estimated to be slaughtered on farms and ranges (p. 55, vol. X. of the 1919 Census). The value of animals sold was probably not far from 80% of the 3,511 million dollars, or 2,800 million dollars, which is 3% of 90,900 million dollars. The value of fresh meat produced in the slaughtering and meat packing industry in the United States in 1919 is given on p. 56, vol. V., of the Census as 1,639 million dollars, which is 1.8% of 90,900 million dollars. The total value of meat sold in the United States in that year might have been as high as 2% of the 90,900 million dollars. The total value of fresh meat sold plus the value of live stock sold in the United States in 1919 was about 5% of the rough estimate of the total value output plus imports for all industries.

Let us consider now the estimate of the value at 1924 prices in Melbourne of the average annual production of meat in Australia in 1922-3 to 1924-5 as a percentage of the rough estimate of the value of output plus imports for Australia in the year 1924-5, namely, 3.8%. If the value of live stock sold in Australia were one and a half times the value of fresh meat sold, corresponding roughly to the situation in the United States, the total value of meat produced and live stock sold in Australia in 1924-5 would have been round about £m. 80, or about 9.5% of £m. 840. The percentage weight allowed in the wholesale prices index number, even if no live stock is included in the index, should not be as high as 9.5% for the following reasons. £m. 840 is less than the total value of wholesale trade, and the price of meat fluctuates much more than the general price level. Probably it should never have a greater percentage weight than about 6% or 7%.

Group VII.—Building Materials.

An approximation to the output plus imports of these goods in 1924-5 may be obtained by adding the value of output of the "factories" producing stone, clay, bricks and glass (Group III., Table 182, *Production Bulletin*), the output of the "factories" producing paints and varnishes, the value of paints and varnishes imported, and the value imported of stones and minerals minus the value imported of ores and concentrates (Class II., Imports, in *Overseas Trade Bulletin No.* 22), and the value of forestry production. The forestry production is obtained from the value of production in forestry and fisheries

(*Production Bulletin No.* 18, p. 163) minus the value of fisheries production collected from the various items on p. 93. The total value of production plus imports of these building materials mentioned comes to £m. 26.2. This total should be diminished by about £m. 2 because of the inclusion in Group III. in Table 182 of the *Production Bulletin* of the output of modelling, ornamental glass and bottles. £m. 24.2 is 2.9% of £m. 840, and this should be near the percentage weight of building materials, unless they are considered to represent other excluded goods. The actual weight of this group in the Melbourne index for 1915 is 4.3%.

Group VIII.—Chemicals.

The value of output of drugs and chemicals in *Production Bulletin No.* 18, Table 182, minus the output of paints and varnishes, was for 1924-5 £m. 7.9, the value of imports of drugs, chemicals and fertilisers (Class 19, Imports, in *Overseas Trade Bulletin*) £m. 4.1, and the total of these two items £m. 12, which is 1.4% of £m. 840.

APPENDIX K.

Interpolations, price quotations and calculations for the indexes of wholesale prices for Melbourne compiled by the writer and based on 77 price quotations.

The mass units and all the price quotations except the interpolated prices mentioned below were taken from the *Annual Labour Reports of the Commonwealth Bureau of Census and Statistics.* The Sydney price quotations referred to are those published in the *New South Wales Statistical Register,* 1919-1920 to 1926.

I.—Interpolations.

Tinned Plates.—The Sydney price quotations for tinned plates for 1906 to 1911 were directly interpolated, because the same brand of tinned plates is taken for the Melbourne and Sydney indexes and because the price quotations for Melbourne and Sydney in 1912 were nearly the same, being 17s. 1d. for Melbourne and 16s. 9d. for Sydney.

Tobacco.—The prices of the four grades of tobacco quoted for Sydney remained unchanged from 1922 to 1924, and fell, on the average, 1% from 1924 to 1925. Melbourne prices were interpolated on the assumption that prices in that city had the same percentage change as in Sydney from 1922 to 1925. As no price quotations for Sydney for 1926 have been published at the time of writing, and as the price of tobacco is usually very stable, it was assumed that the price of tobacco in Melbourne had remained unchanged from 1925 to 1926.

Cocoa, Candles.—Prices for the years 1918 to 1920 for cocoa and candles were interpolated on the assumption that the percentage change from the preceding year was the same in Melbourne as the percentage change in the same period of the similar commodity in Sydney.

Condensed Milk.—The price of condensed milk was interpolated for the years 1906 to 1911 on the assummption that the percentage change from each of the years for which no Melbourne quotations are available to 1912 was the same as in the Sydney price quotation for that commodity.

	Interpolated Melbourne price quotations per dozen tins, 1906 to 1911, and the actual Melbourne price quotation for 1912.	Sydney price quotations per 42 lb. case.
	s.	s.
1906	5.258	24.5
1907	5.687	26.5
1908	5.776	26.917
1909	5.437	25.333
1910	4.864	22.667
1911	5.294	24.667
1912	5.687	26.5

Fine Salt, Mustard, Starch, Blue.—Prices were interpolated for these commodities in 1918, the prices interpolated being the arithmetic means of their 1917 and 1919 quotations.

Rice.—Prices for rice were interpolated for 1918 and 1919, the prices interpolated being the arithmetic means of the 1917 and 1920 quotations.

Flooring Timber, 6 × 1½; Flooring Timber, 6 × ¾; Shelving Timber.—Arithmetic means of their 1918 and 1920 price quotations were interpolated for these commodities in 1919.

In all these instances of the interpolation of arithmetic means, it is justifiable because the period 1917 to 1920 was a period of steadily rising prices for the groceries and building materials groups.

Leather.—The three leather items in the Melbourne index from 1906 to 1911 are not the same as the items included after 1911, and differ from them in relative importance.

It was decided to interpolate price quotations for the years 1906 to 1911 for the three leather items used after 1911.

First of all, the percentage change of the total cost of the mass units of the three leather items, kip, calf and basils, from each of the years of the period 1906-11 to 1912 was calculated from the price quotations in *Labour Reports Nos.* 1 and 2, 1912, being taken as 100.

Change in the Cost of the Mass Units of Leather in the Melbourne Index from 1906 *to* 1912.

	1906	1907	1908	1909	1910	1911	1912
	£	£	£	£	£	£	£
Kip	79	80	79	76	84	85	85
Calf	76	80	80	79	81	83	83
Basils	29	31	30	28	26	25	25
Total	184	191	189	183	191	193	193
Index	95.3	99.	97.9	94.8	99	100.	100.

Interpolations were then made for medium crop, waxed kip and waxed split for the years 1906 to 1911 on the assumption that their prices had the same percentage change from each of the years 1906-11 to 1912 as the total cost of the mass units of kip, calf and basils.

Interpolations for the Years 1906-1911 *and the Actual Price Quotations for* 1912 *of Medium Crop, Waxed Kip and Waxed Split.*

	1906	1907	1908	1909	1910	1911	1912
	s.	s.	s.	s.	s.	s.	s.
Medium crop	1.062	1.103	1.091	1.056	1.103	1.114	1.114
Waxed kip	1.459	1.516	1.499	1.451	1.516	1.531	1.531
Waxed split	.764	.794	.785	.760	.794	.802	.802

II.—Table, Showing Price Quotations and Calculations.

The price quotations from the *Labour Reports* were converted into decimals of a shilling correct to the third place, and then multiplied by the appropriate mass unit and the result entered correct to the nearest pound sterling. This amount of accuracy in converting the prices into decimals was quite unnecessary for all but one or two commodities, and even for these

it is not really necessary, because the biggest difference that could have occurred in the indexes by taking the decimals to the second place would be only one tenth of one per cent. As they stand now, however, the decimals can be converted back into pence, farthings, and eighths and sixteenths of a penny as they are given in the *Labour Reports.*

Note on the Mass Units and the Substitution of Commodities.—The mass units of some commodities were altered during the period in accordance with a change in the physical unit of the commodity for which the price was quoted. The mass units of *bran* and *pollard* were 1400 up to the year 1911, and 14 from the year 1912 onwards.

The mass unit of *lamb* was 200 up to 1914 and 5,600 thereafter.

Tapioca was substituted for *sago* in the year 1923, when the prices of these commodities in Melbourne, according to *Labour Reports Nos.* 14 and 15, were the same. The mass unit for sago was 800 up to 1911, .35 from 1912 to 1916, and 7 thereafter for sago, and also for tapioca when it was substituted for sago in 1923. One of the grades of leather for which a price quotation was given in 1912 was medium crop. Later on, factory crop was substituted for this and still later light crop.

Table showing prices, mass units, and the cost of the mass units, 1906 to 1910. For the missing mass units and information about the substitution of commodities, see the note above.

	Mass Unit.	1906. Price.	1906. Cost of M. U.	1907. Price.	1907. Cost of M. U.	1908. Price.	1908. Cost of M. U.	1909. Price.	1909. Cost of M. U.
Group I.		$	£	$	£	$	£	$	£
Iron—Pig	3.5	80.583	23	81.25	23	79.417	23	79.417	23
Rod and Bar	3.5	192.667	24	201.417	25	204.25	26	196.75	24
Angle and Tee	3.5	197.333	25	211.417	27	215.	28	205.	26
Plate	3.	197.333	30	211.417	32	213.458	32	195.167	29
Hoop	.5	198.833	5	210.542	5	216.917	5	212.667	5
Galvanised Corrugated	5.	343.25	86	393.208	98	370.	93	366.333	92
Wire, Fencing	6.	170.167	51	175.625	53	155.292	47	162.167	49
Zinc—Sheet	1.	696.917	35	761.417	38	667.667	33	613.833	31
Lead—Sheet	.75	417.333	16	465.708	17	366.167	14	341.167	13
Lead—Piping	.5	440.25	11	490.708	12	430.375	11	421.167	11
Copper—Sheet	2,000.	1.01	101	1.125	113	.990	99	.985	99
Coal (on Wharf)	600.	17.25	518	21.5	645	22.5	675	22.5	675
Tinned Plates	60.	15.208	46	16.792	50	15.583	47	14.812	44
Total			994		1161		1156		1134
Group II.									
Jute Goods—Brasbags	110	5.902	28	5.25	29	4.385	24	3.708	20
Cornsacks	250	6.927	87	7.	88	5.521	69	4.802	60
Woolpacks	300	2.375	24	2.708	27	2.25	23	2.083	21
Leather—									
Medium Crop or Substitute	600	1.902	32	1.103	33	1.091	33	1.054	32
Waxed Kip	600	1.459	44	1.516	45	1.499	45	1.451	44
Waxed Split	600	.764	23	.794	24	.785	24	.760	23
Cotton—Raw	24,000	.552	662	.593	712	.542	650	.552	662
Wool	12,200	.937	572	.927	565	.802	489	.843	514
Total			1472		1523		1357		1376
Group III.									
Wheat	500	3.229	81	3.75	94	4.167	104	4.583	115
Flour	48	142.75	343	169.833	405	179.25	430	206.917	497
Bran		.822	56	.875	61	1.187	83	.875	61
Pollard		.854	60	.906	63	1.239	87	1.031	72
Oats	1,200	2.687	161	2.667	160	2.917	175	2.208	132
Oatmeal	1.5	200.	23	323.5	24	383.5	29	291.917	22
Barley—Malting or English	150	4.562	34	4.542	34	4.937	37	3.917	29
Feed or Cape	100	2.896	14	2.75	14	3.687	18	2.479	12
Maize	1,000	3.25	163	3.167	158	4.25	213	3.937	197
Peas	55	3.687	10	3.396	9	3.937	11	4.531	12
Total			947		1022		1187		1149
Group IV.									
Ham	800	.802	32	.896	36	.958	38	1.01	40
Bacon	2,200	.572	92	.646	103	.729	117	.708	113
Cheese	1,500	.593	44	.646	48	.833	62	.729	55
Butter	9,500	.958	455	.979	465	1.156	549	1.062	504
Lard	200	.458	5	.479	5	.677	7	.542	5
Eggs	1,800	.812	73	.885	80	1.021	92	1.031	93
Honey	600	.25	6	.229	7	.26	8	.25	8
Condensed Milk	160	5.258	42	5.667	45	5.776	46	5.437	43
Total			751		789		919		861
Group V.									
Currants	1,400	.364	25	.437	31	.468	33	.468	33
Raisins	1,400	.51	36	.604	42	.562	39	.521	36
Herrings	50	4.208	11	4.771	12	4.562	11	4.521	11
Salmon	50	6.417	16	6.093	15	7.052	18	6.875	17
Sardines	100	4.875	24	5.01	25	5.	25	5.104	26
Tea	3,000	.614	92	.677	102	.667	100	.687	103
Coffee	200	1.125	11	1.125	11	1.125	11	1.125	11
Cocoa	100	1.	5	1.031	5	1.125	6	1.125	6
Sugar	22	401.583	442	395.333	435	413.5	455	428.5	409
Macaroni	200	.417	4	.437	4	.437	4	.437	4
Sago or Tapioca		.229	9	.25	10	.156	6	.156	6
Rice	2	452.	45	498.	50	507.333	51	495.	50
Salt—Fine	7	67.5	24	70.167	25	75.5	26	81.25	28
Mustard	6	18.	5	18.354	6	19.	6	19.	6
Starch	100	.417	2	.417	2	.417	2	.417	2
Blue	50	.604	2	.635	2	.697	2	.697	2
Matches	90	1.843	8	2.375	11	2.729	12	2.489	11
Candles	1,600	.521	42	.604	48	.604	48	.604	48
Kerosene	1,700	.739	63	.771	66	.822	70	.822	70
Tobacco	1,300	4.656	303	4.604	299	4.604	299	4.604	299
Total			1169		1201		1224		1238
Group VI.									
Beef	390	21.646	422	26.292	513	28.312	552	23.021	449
Mutton	33,000	.197	325	.229	378	.218	360	.167	276
Lamb		9.292	93	9.146	91	9.187	92	8.312	83
Veal	2,000	.177	18	.177	18	.197	20	.167	17
Pork	3,700	.354	65	.417	77	.468	87	.5	93
Total			923		1077		1111		918
Group VII.									
Timber—Flooring, 6 x 1½	30	9.521	14	10.333	15	10.312	15	10.26	15
6 x 1	30	7.729	12	8.333	12	7.917	12	8.104	12
6 x ¾	30	6.5	10	7.447	11	7.167	11	7.114	11
6 x ½	30	5.083	8	5.271	8	5.146	8	5.25	8
Weatherboards	200	5.843	58	6.239	62	5.812	58	5.542	55
Oregon	20	127.083	127	134.667	135	113.833	114	107.312	107
Shelving	10	256.	128	280.708	140	305.	153	306.542	153
Cement	30	11.437	17	12.052	18	12.917	19	11.958	18
Whitelead	.75	553.5	21	629.25	24	585.417	22	560.417	21
Total			395		425		412		400
Group VIII.									
Cream of Tartar	400	.729	15	.822	16	.75	15	.667	13
Carbonate of Soda	.5	180.	5	196.75	5	182.083	5	162.5	4
Saltpetre	.05	490.75	1	597.833	1	582.667	1	592.333	1
Sulphur	.25	161.5	2	175.667	2	160.	2	166.167	2
Total			23		24		23		20
Aggregate			6674		7222		7389		7096

Table showing prices, mass units, and the cost of the mass units, 1906 to 1926. For the missing mass units and information about the substitution of commodities, see the note above.

1910.		1911.		1912.		1913.		1914.	
Price.	Cost of M. U.	Price.	Cost of M. U.	Price.	Cost of M. U.	Price.	Cost of M. U.	Price.	Cost of M. U.
s.	£	s.	£	s.	£	s.	£	s.	£
81.	26	81.167	26	83.167	27	96.	31	99.5	32
194.375	34	191.167	33	216.583	38	228.25	40	234.	41
197.667	35	195.	34	202.917	36	210.	37	214.	37
192.125	29	192.5	29	201.333	30	205.5	31	220.	33
209.625	5	203.833	5	212.333	5	215.833	5	225.5	6
354.708	89	347.417	87	359.417	90	373.75	93	383.5	96
171.333	51	169.25	51	156.917	47	154.167	46	156.5	47
601.542	30	673.833	34	733.083	37	745.	37	785.	39
322.125	12	315.917	12	405.	15	478.75	18	498.	19
405.167	10	367.25	9	448.333	11	566.25	14	610.	15
.802	80	.771	77	.854	85	.968	97	1.062	106
22.5	675	22.5	675	22.5	675	22.5	675	23.75	713
16.062	48	17.333	52	17.063	51	16.875	51	17.063	51
	1124		1124		1147		1175		1235
3.427	19	4.042	22	5.979	33	6.604	36	5.667	31
4.76	60	5.292	66	5.906	74	7.25	91	6.542	82
2.156	22	2.385	24	2.75	28	2.917	29	3.583	36
1.108	33	1.114	33	1.114	33	1.302	39	1.333	40
1.516	45	1.531	46	1.531	46	1.646	49	1.75	53
.794	24	.802	24	.802	24	.917	28	1.042	31
.729	875	.646	775	.51	612	.562	674	.521	625
.906	553	.885	540	.792	483	.812	495	.802	489
	1631		1530		1333		1441		1387
3.854	96	3.521	88	4.083	102	3.635	91	4.354	109
180.75	434	160.417	385	178.333	428	174.625	419	198.083	475
.906	63	.958	67	117.5	82	101.333	71	119.333	84
.906	63	.958	67	125.833	88	103.5	72	123.5	86
2.396	144	2.375	143	3.208	192	2.208	132	2.542	153
302.333	23	311.833	23	414.583	31	335.5	25	346.	26
4.083	31	4.75	36	5.937	45	3.958	30	4.	30
2.333	12	2.5	13	4.667	23	2.927	15	2.792	14
2.646	132	2.76	138	4.083	204	3.958	198	3.917	196
4.864	13	3.937	11	4.062	11	4.375	12	5.208	14
	1011		971		1206		1065		1187
1.021	41	.947	38	1.042	42	.917	37	1.031	41
.656	105	.562	90	.802	128	.771	123	.812	130
.593	44	.635	48	.917	69	.687	52	.771	58
.947	450	.958	455	1.125	534	.958	455	1.042	495
.51	5	.468	5	.593	6	.593	6	.614	6
.958	86	1.	90	1.125	101	.958	86	.989	89
.271	8	.25	8	.281	8	.25	8	.271	8
4.864	39	5.294	42	5.667	45	5.708	46	5.917	47
	778		776		933		813		874
.479	24	.489	24	.479	24	.447	21	.396	28
.562	30	.552	29	.562	29	.427	30	.458	32
4.562	11	4.479	11	4.5	11	4.667	12	5.417	14
7.406	19	8.885	22	9.437	24	8.292	21	8.083	20
5.	25	5.125	26	5.167	26	5.375	27	5.5	28
.687	103	.75	113	.718	108	.713	107	.697	105
1.125	11	1.125	11	1.208	12	1.25	13	1.25	13
1.125	6	1.125	6	1.125	6	1.125	6	1.146	6
448.	493	437.5	481	474.	521	448.167	493	432.667	476
.458	5	.479	5	.271	3	.26	3	.26	3
.146	6	.177	7	390.	7	314.333	6	277.	5
486.167	49	466.167	47	527.5	53	542.5	54	555.	56
81.25	28	81.25	28	81.25	28	85.625	30	90.	32
19.	6	19.	6	19.	6	19.	6	20.	6
.417	2	.417	2	.417	2	.417	2	.437	2
.697	2	.729	2	.697	2	.697	2	.697	2
2.230	10	2.083	9	2.083	9	2.042	9	2.292	10
.604	48	.604	48	.604	48	.604	48	.604	48
.822	70	.822	70	.843	72	.927	79	.896	76
4.604	299	4.604	299	4.854	316	4.854	316	5.042	328
	1266		1266		1327		1295		1290
19.792	386	18.833	367	25.208	492	22.292	435	28.	546
.167	276	.177	292	.271	447	.234	386	.281	464
8.031	80	8.896	89	9.979	100	11.208	112	12.	120
.167	17	.167	17	.197	20	.218	22	.234	23
.437	81	.364	67	.385	71	.479	89	.516	95
	840		832		1130		1044		1248
10.937	16	11.	17	11.25	17	12.354	19	12.5	19
9.604	14	8.822	13	8.667	13	9.771	15	10.292	15
8.125	12	8.042	12	7.75	12	8.604	13	9.333	14
6.021	9	5.802	9	5.625	8	6.271	9	6.292	9
7.	70	6.593	66	6.333	63	7.292	73	7.167	72
111.25	111	118.25	118	135.75	136	152.417	152	129.	129
330.	165	325.417	163	335.	168	335.	168	333.	167
12.667	19	13.417	20	14.542	22	13.917	21	14.375	22
567.667	21	602.333	23	723.5	27	735.833	28	792.	30
	437		441		466		498		477
.771	15	.885	18	.812	16	.843	17	1.458	29
164.75	4	167.5	4	165.417	4	165.	4	198.	5
660.	2	660.	2	660.	2	660.	2	660.	2
160.75	2	173.083	2	195.75	2	198.667	2	200.	2
	23		26		24		25		36
	7110		6966		7566		7356		7737

Table showing prices, mass units, and the cost of the mass units, 1914 to 1918. For the missing mass units and information about the substitution of commodities, see the note above.

	Mass Unit.	1915. Price.	1915. Cost of M. U.	1916. Price.	1916. Cost of M. U.	1917. Price.	1917. Cost of M. U.	1918. Price.	1918. Cost of M. U.
Group I.		s.	£	s.	£	s.	£	s.	£
Iron—Pig	0.5	99.833	32	124.167	40	218.333	71	245.	80
Rod and Bar	3.5	287.5	50	442.292	77	483.75	85	559.167	98
Angle and Tee	3.5	276.	48	467.917	82	582.917	102	688.75	121
Plate	3.	291.667	44	531.667	80	1063.333	159	1589.167	238
Hoop	.5	306.	8	552.5	14	746.25	19	1127.5	28
Galvanised Corrugated	5.	525.167	131	712.5	178	1243.333	311	1470.833	368
Wire, Fencing	6.	262.833	79	443.333	133	675.417	203	926.25	278
Zinc—Sheet	1.	1413.5	71	2566.667	128	2775.	139	2964.917	148
Lead—Sheet	.75	565.417	21	770.	29	740.	28	751.667	28
Lead—Piping	.5	670.25	17	873.75	22	830.	21	821.667	21
Copper—Sheet	2,000.	1.239	124	1.956	196	2.5	250	2.875	288
Coal (on Wharf)	600.	25.	750	27.	810	29.	870	29.	870
Tinned Plates	60.	21.792	65	38.	114	44.25	133	50.417	151
Total			1440		1903		2391		2717
Group II.									
Jute Goods—Brandags	110	6.458	36	7.956	44	8.271	45	11.917	66
Cornsacks	250	7.708	96	9.562	120	9.333	117	9.875	123
Woolpacks	200	3.167	32	3.917	39	4.146	41	6.292	63
Leather—									
Medium Crop or Substitute	600	1.354	41	1.614	48	1.854	56	1.833	55
Waxed Kip	600	1.958	59	2.042	61	2.396	72	2.5	75
Waxed Split	600	1.167	35	1.312	39	1.333	40	1.333	40
Cotton—Raw	24,000	.468	562	.672	806	1.302	1562	1.864	2237
Wool	12,200	.833	508	1.167	712	1.317	803	1.406	858
Total			1370		1869		2736		3517
Group III.									
Wheat	500	7.5	188	4.833	121	4.75	119	4.75	119
Flour	48	330.5	793	226.75	544	215.	516	215.	516
Bran		158.333	111	92.917	65	89.	62	94.583	66
Pollard		188.333	132	112.417	79	119.25	83	116.417	81
Oats	1,200	4.5	270	2.25	135	2.458	147	3.833	230
Oatmeal	1.5	542.917	41	360.	27	360.	27	467.	35
Barley—Malting or English	150	5.583	42	4.354	33	4.396	33	5.75	43
Feed or Cape	100	4.5	23	3.125	16	3.125	16	4.	20
Maize	1,000	5.25	263	4.792	240	3.708	185	5.167	258
Peas	55	6.917	19	6.104	17	6.25	17	6.583	18
Total			1882		1277		1205		1386
Group IV.									
Ham	800	1.125	45	1.292	52	1.125	45	1.167	47
Bacon	3,200	1.042	167	1.083	173	1.021	163	1.042	167
Cheese	1,500	1.021	77	1.042	78	.958	72	1.	75
Butter	9,500	1.458	693	1.375	653	1.333	633	1.343	638
Lard	200	.896	9	.854	9	.833	8	.729	7
Eggs	1,800	1.354	122	1.229	111	1.042	94	1.042	94
Honey	600	.417	13	.427	13	.417	13	.417	13
Condensed Milk	160	6.583	53	7.521	60	7.667	61	8.042	64
Total			1179		1149		1089		1106
Group V.									
Currants	1,400	.51	36	.635	44	.562	39	.583	41
Raisins	1,400	.51	36	.583	41	.562	39	.583	41
Herrings	50	6.875	17	9.	23	9.333	23	11.333	28
Salmon	50	8.958	22	9.958	25	13.167	33	16.417	41
Sardines	100	6.375	32	8.458	42	11.292	56	11.625	58
Tea	3,000	.843	126	.875	131	.797	120	.906	136
Coffee	200	1.25	13	1.25	13	1.167	12	1.167	12
Cocoa	100	1.208	6	1.229	6	1.292	6	1.360	7
Sugar	22	463.083	509	584.375	643	587.5	646	587.5	646
Macaroni	200	.38	4	.364	4	.364	4	.364	4
Sago or Tapioca		352.083	8	476.667	8	30.25	11	30.7	11
Rice	2	558.	56	619.167	62	640.	64	790.	79
Salt—Fine	7	93.75	33	92.062	32	95.333	33	98.604	35
Mustard	6	21.583	6	24.417	7	28.542	9	32.606	10
Starch	100	.489	2	.572	3	.625	3	.709	4
Blue	50	.697	2	.697	2	.697	2	1.057	3
Matches	90	4.292	19	3.833	17	4.083	18	4.542	20
Candles	1,600	.604	48	.667	53	.687	55	.801	64
Kerosene	1,700	.922	78	1.333	113	1.667	142	2.	170
Tobacco	1,300	5.771	375	5.771	375	5.771	375	6.292	409
Total			1428		1644		1690		1819
Group VI.									
Beef	390	50.292	981	47.833	933	46.75	912	49.042	956
Mutton	33,000	.453	747	.5	825	.463	764	.447	738
Lamb		.505	141	.572	160	.552	155	.5	140
Veal	2,000	.375	38	.468	47	.542	54	.5	50
Pork	3,700	.656	121	.718	133	.625	116	.552	102
Total			2028		2098		2001		1986
Group VII.									
Timber—Flooring, 6 x 1½	30	15.271	23	17.583	26	22.5	34	25.083	38
6 x 1	30	12.375	19	15.604	23	18.417	28	22.	33
6 x ¾	30	10.958	16	14.437	22	18.333	27	21.667	33
6 x ½	30	7.417	11	9.75	15	14.667	22	17.917	27
Weatherboards	200	7.833	78	9.417	94	13.167	132	18.917	189
Oregon	20	164.167	164	206.208	206	266.833	267	375.667	376
Shelving	10	360.	180	393.75	197	468.75	234	779.167	390
Cement	30	21.167	32	19.	29	20.417	31	24.	36
Whitelead	.75	873.75	33	1232.5	46	1466.667	55	1700.	64
Total			556		657		830		1186
Group VIII.									
Cream of Tartar	400	2.042	41	1.979	40	2.625	53	4.	80
Carbonate of Soda	.5	207.917	5	261.875	7	443.75	11	307.417	8
Saltpetre	.05	660.	2	945.	2	1428.333	4	1388.667	3
Sulphur	.25	275.	3	425.	5	452.083	6	487.333	6
Total			51		54		74		97
Aggregate			9932		10861		12016		13813

Table showing prices, mass units, and the cost of the mass units, 1906 to 1926. For the missing mass units and information about the substitution of commodities, see the note above.

1919.		1920.		1921.		1922.		1923.	
Price.	Cost of M. U.	Price.	Cost of M. U.	Price.	Cost of M. U.	Price.	Cost of M. U.	Price.	Cost of M. U.
s.	£	s.	£	s.	£	s.	£	s.	£
247.5	80	256.667	83	220.	72	198.	64	165.	54
322.083	91	572.5	100	596.667	104	464.	81	367.5	64
594.167	104	563.333	99	582.917	102	479.5	84	391.667	69
1042.5	156	990.417	149	759.167	114	423.	63	336.667	51
915.833	23	975.	24	931.667	23	493.	12	382.5	10
1108.5	277	1161.25	290	831.583	208	559.	140	562.5	141
472.5	142	483.333	145	430.	129	393.5	118	356.	107
2823.333	141	1895.833	95	1754.167	88	1391.5	70	1087.5	54
785.417	29	1047.917	39	884.75	33	767.5	29	876.667	33
856.667	21	1322.5	33	959.167	24	896.	22	942.5	24
2.875	238	2.292	229	2.458	246	2.083	208	1.583	158
31.083	932	35.875	1076	39.667	1190	40.	1200	40.	1200
48.125	144	73.	219	36.583	110	30.25	91	29.5	89
	2378		2581		2443		2182		2054
12.833	71	13.167	72	6.583	36	7.333	40	7.917	44
12.5	156	14.583	182	8.417	105	9.292	116	9.625	120
5.292	53	6.417	64	3.917	39	4.292	43	4.708	47
2.125	64	2.75	82	1.417	43	1.271	38	1.354	41
2.833	85	3.25	98	2.083	62	1.896	57	2.083	62
1.458	44	1.75	53	1.333	40	1.271	38	1.354	41
1.583	1900	1.812	2174	.792	950	1.	1200	1.312	1574
1.370	836	1.396	852	.947	578	1.271	775	1.682	1026
	3209		3578		1853		2307		2955
5.104	128	7.562	189	8.917	223	5.604	140	5.042	126
221.792	532	335.125	804	401.	962	254.5	611	231.333	555
129.792	91	170.583	119	168.	118	154.75	108	154.917	108
138.542	97	170.5	119	168.167	118	158.5	111	160.667	112
5.125	308	4.875	293	2.604	156	3.458	207	3.708	222
689.167	48	670.833	50	425.833	32	471.	35	480.	36
5.812	44	7.271	55	4.417	33	4.125	31	4.062	30
4.542	23	6.208	31	3.417	17	3.	15	3.125	16
6.917	346	7.958	398	4.75	238	5.167	258	5.604	280
7.917	22	10.208	28	8.25	23	8.208	23	7.062	19
	1639		2086		1920		1539		1504
1.292	52	1.958	78	1.833	73	1.667	67	1.75	70
1.167	187	1.625	260	1.542	247	1.25	200	1.25	200
1.125	84	1.292	97	1.333	100	1.083	81	1.312	98
1.583	752	2.125	1009	1.833	871	1.458	693	1.75	831
.958	10	1.437	14	.917	9	.604	6	.792	8
1.187	107	1.667	150	1.5	135	1.333	120	1.375	124
.5	15	.667	20	.5	15	.375	11	.375	11
9.208	74	11.375	91	12.333	99	11.062	88	11.062	88
	1281		1719		1549		1266		1430
.614	43	.718	50	.771	54	.771	54	.583	41
.614	43	.75	53	.781	55	.822	58	.792	55
9.812	25	10.312	26	10.583	26	8.708	22	7.583	19
18.333	46	22.333	56	22.083	55	18.083	45	15.667	39
11.021	55	13.625	68	12.833	64	8.833	44	7.521	38
.932	140	1.104	166	.833	125	1.031	155	1.292	194
1.25	13	2.021	20	2.125	21	2.125	21	2.125	21
1.428	7	1.855	9	1.417	7	1.25	6	1.25	6
587.5	646	881.875	970	980.	1078	956.667	1052	828.833	912
.896	4	.542	5	.51	5	.5	5	.489	5
36.833	13	37.458	13	26.583	9	25.75	9	32.417	11
940.	94	1090.	109	842.917	84	512.5	51	446.667	45
101.875	36	111.667	39	120.917	42	120.	42	117.5	41
36.667	11	43.292	13	44.667	13	45.375	14	45.375	14
.792	4	1.333	7	1.292	6	.979	5	.958	5
1.417	4	1.104	3	1.083	3	.958	2	.958	2
5.229	24	6.875	31	6.125	28	6.	27	6.062	27
.871	70	1.030	82	.812	65	.792	63	.771	62
2.167	184	2.542	216	2.583	220	1.833	156	1.625	138
7.333	477	7.542	490	8.	520	6.	520	8.	520
	1939		2426		2480		2351		2195
50.5	985	65.917	1285	38.167	744	27.417	535	41.917	817
.406	670	.614	1013	.417	688	.375	619	.583	962
.468	131	.729	204	.562	157	.542	152	.718	201
.375	38	.489	49	.396	40	.25	25	.312	31
.677	125	.968	179	.958	177	.771	143	.771	143
	1949		2730		1806		1474		2154
29.542	44	34.	51	30.083	45	25.667	39	22.875	34
27.167	41	30.333	45	25.25	38	19.833	30	17.75	27
24.5	37	27.333	41	22.333	33	17.292	26	15.75	24
19.	29	19.25	29	16.	24	14.167	21	11.333	17
20.167	202	21.083	211	16.833	168	14.708	147	12.75	128
356.25	356	467.917	468	327.25	327	241.	241	262.	262
865.417	433	951.667	476	893.75	447	589.	295	642.5	321
23.833	36	27.5	41	42.	63	23.167	35	20.458	31
1422.5	53	1750.	66	1662.	62	1319.	49	1182.5	44
	1231		1428		1207		883		888
2.292	66	2.167	63	1.917	38	1.5	30	1.229	25
410.833	10	418.75	10	379.167	9	365.	9	320.833	8
1433.333	4	1175.	3	976.667	2	900.	2	852.5	2
328.25	4	398.333	5	369.333	5	276.	3	254.333	3
	84		81		54		44		36
	18710		18629		13312		12046		13218

Table showing prices, mass units, and the cost of the mass units, 1906 to 1926. For the missing mass units and information about the substitution of commodities, see the note above.

	Mass Unit.	1924. Price.	1924. Cost of M. U.	1925. Price.	1925. Cost of M. U.	1926. Price.	1926. Cost of M. U.
Group I.		s.	£	s.	£	s.	£
Iron—Pig	6.5	159.167	52	157.5	51	140.	46
Rod and Bar	3.5	381.667	67	405.	71	415.833	73
Angle and Tee	3.5	356.667	62	358.75	63	352.083	62
Plate	3.	323.333	48	316.25	47	303.75	46
Hoop	.5	380.	10	380.	10	380.	10
Galvanised Corrugated	5.	575.833	144	573.917	143	572.083	143
Wire, Fencing	6.	354.5	106	300.	90	291.667	88
Zinc—Sheet	1.	1160.417	58	1281.25	64	1281.083	64
Lead—Sheet	.75	890.833	33	1026.25	38	979.167	37
Lead—Piping	.5	1001.667	25	1160.	29	1160.	29
Copper—Sheet	2,000.	1.562	156	1.537	154	1.442	144
Coal (on Wharf)	600.	40.	1200	40.667	1220	44.25	1328
Tinned Plates	60.	34.75	104	33.75	101	35.833	107
Total			2065		2081		2177
Group II.							
Jute Goods—Brasbags	110	7.021	39	9.120	50	9.432	52
Cornsacks	250	12.5	156	13.187	165	12.37	154
Woolpacks	200	5.019	50	5.734	57	5.338	53
Leather—							
Medium Crop or Substitute	600	1.417	43	1.496	45	1.442	43
Waxed Kip	600	1.833	55	2.	60	2.	60
Waxed Split	600	1.167	35	1.141	34	1.167	35
Cotton—Raw	24,000	1.333	1600	1.021	1225	.734	881
Wool	12,200	2.208	1347	1.734	1058	1.437	877
Total			3325		2694		2156
Group III.							
Wheat	500	5.375	134	6.073	152	6.206	155
Flour	48	265.833	638	296.167	711	293.917	705
Bran		116.5	82	150.75	106	148.167	104
Pollard		138.583	97	170.	119	185.583	130
Oats	1,200	3.312	199	3.093	186	3.578	215
Oatmeal	1.5	510.	38	477.5	36	537.5	40
Barley—Malting or English	150	4.667	35	5.812	44	4.401	33
Feed or Cape	100	4.125	21	4.630	23	3.979	20
Maize	1,000	4.604	230	4.739	237	6.062	303
Peas	55	6.385	18	5.562	15	7.979	22
Total			1492		1629		1727
Group IV.							
Ham	800	1.75	70	1.729	69	1.739	70
Bacon	3,200	1.333	213	1.271	203	1.208	193
Cheese	1,500	1.104	83	1.083	81	1.292	97
Butter	9,500	1.417	673	1.432	680	1.531	727
Lard	200	.896	9	.697	7	.776	8
Eggs	1,800	1.458	131	1.37	123	1.479	133
Honey	600	.5	15	.364	11	.422	13
Condensed Milk	160	11.375	91	11.437	91	11.437	91
Total			1285		1265		1332
Group V.							
Currants	1,400	.583	41	.578	40	.578	40
Raisins	1,400	.552	39	.557	39	.521	36
Herrings	50	7.5	19	7.562	19	7.75	19
Salmon	50	15.5	39	16.5	41	20.375	51
Sardines	100	8.667	43	8.312	42	7.75	39
Tea	3,000	1.479	222	1.542	231	1.588	238
Coffee	200	2.125	21	2.125	21	2.125	21
Cocoa	100	1.25	6	1.25	6	1.25	6
Sugar	22	782.5	861	781.	859	777.583	855
Macaroni	200	.479	5	.458	5	.458	5
Sago or Tapioca		30.625	11	22.917	8	20.417	7
Rice	2	442.917	44	445.	45	445.	45
Salt—Fine	7	124.167	43	128.667	45	130.	46
Mustard	6	45.375	14	45.375	14	45.375	14
Starch	100	.917	5	.917	5	.917	5
Blue	50	.958	2	.968	2	.968	2
Matches	90	5.958	27	5.995	27	5.63	25
Candles	1,600	.771	62	.781	62	.781	62
Kerosene	1,700	1.667	142	1.625	138	1.625	138
Tobacco	1,300	8.	520	7.792	506	7.792	506
Total			2166		2155		2160
Group VI.							
Beef	390	32.	624	34.302	669	36.437	711
Mutton	33,000	.5	825	.489	807	3.49	576
Lamb		.718	201	.697	195	.542	152
Veal	2,000	.312	31	.322	32	.338	34
Pork	3,700	.896	166	.833	154	.724	134
Total			1847		1857		1609
Group VII.							
Timber—Flooring, 6 x 1¼	30	22.083	33	20.583	31	19.505	29
6 x ⅞	30	16.083	24	15.667	24	15.641	23
6 x ¾	30	14.083	21	13.542	20	13.38	20
6 x ½	30	10.583	16	10.833	16	9.854	15
Weatherboards	200	11.5	115	11.302	113	10.76	108
Oregon	20	232.5	233	221.667	222	219.167	219
Shelving	10	556.25	278	488.	244	464.167	232
Cement	30	20.562	31	20.167	30	20.625	31
Whitelead	.75	1215.833	46	1272.917	48	1331.25	50
Total			797		748		727
Group VIII.							
Cream of Tartar	400	1.197	24	1.224	24	1.156	23
Carbonate of Soda	.5	282.5	7	275.	7	275.	7
Saltpetre	.05	723.75	2	715.	2	715.	2
Sulphur	.25	235.	3	235.	3	235.	3
Total			36		36		35
Aggregate			13013		12465		11921

INDEX

Brown, Prior & Co. Pty. Ltd., 490 Little Bourke St., Melbourne, C.1