THE COURSE OF PRICES IN NEW ZEALAND.

AN INQUIRY

INTO THE NATURE AND CAUSES OF THE VARIATIONS IN THE STANDARD OF VALUE IN NEW ZEALAND.

BY

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AUTHOR'S NOTE.

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INTRODUCTION.

THE following essay embodies the results of a post-graduate research in economics at Canterbury College, undertaken in the hope that it will help all engaged in the solution of those practical problems of social life in which changes in the purchasing-power of money are an important factor.

As there is no University Press in New Zealand, the Government of the Dominion generously undertook to print and publish the essay, and it is hoped that the official interest thus shown in a subject of study that, in spite of its direct bearing on the welfare of the people, has received little assistance from the State in New Zealand will grow and bear fruit in the national endowment of research. There is in this country a vast and promising field for economic research, but hitherto it has been worked chiefly by occasional visitors from abroad; and, as no political policy can be regarded as enlightened which is not in harmony with principles deduced from a sustained scientific study of the facts of the past and present by those familiar with local conditions, and as the main questions in politics in New Zealand are and must continue to be chiefly economic, it behoves the people, through Parliament, to provide adequate means for the organization of economic studies in the University colleges and to encourage the growth of close relations between the Departments of Government and the social science departments of the colleges.

The essay has two main objects. In the first place it measures the changes in the general level of prices, year by year, since 1860, these changes, for convenience in making comparisons, being expressed by index numbers that have been framed on a basis described in the text. The index number is now regarded as an indispensable instrument in any inquiry into questions affected by changes in the purchasing-power of money, and Dr. McIlraith here seeks to provide for New Zealand what has been available for some time to statesmen and economic investigators generally in England and America. But the author attempts to ascertain not only the extent but also the causes of the changes in the local price-level. Such causes may be grouped under two heads: (1) Changes in the conditions of production of commodities and of services, due to the general increase (or decrease) in the efficiency of the productive powers of nature, labour, and capital, and their organization; and (2) changes affecting the amount and the nature of money and of substitutes for money in use. The causes of the fluctuations in the price-level can be determined with much less precision than their extent; but an investigation, such as Dr. McIlraith's, will help those working at such problems as the causes of the recent rise in the cost of living, though no economist would admit that this particular problem is one of general prices alone.

Some of the more important purposes for which the index numbers can be readily used are: To compare the purchasing-

power of money incomes in New Zealand and other places, thus rendering easier comparisons of standards of living and supplying necessary information to persons intending to emigrate or to invest capital; to indicate the degree of social progress and changes in national material welfare from time to time, by interpreting in modern terms the money quotations of previous times; to estimate with greater precision than is now possible the adjustment in taxation rendered necessary or politic by changes in the value of money; to understand the real meaning of changes in the amount of the national wealth as expressed in terms of money; to adjust salaries, annuities, and wages to changes in the purchasing-power of the standard money; and to furnish generally an equitable basis for the payment of long-period debts. In order to extend their utility, the author proposes not only to continue the tables from year to year in the future and to revise and enlarge the data, but also to select certain typical wage-earning groups and to investigate the changes in the purchasing-power of their incomes over a considerable period. Until a second edition of this essay is demanded the results of these investigations will appear in the annual volumes of the "New Zealand Official Year-book."

A word of warning to those unfamiliar with scientific method who may be tempted to found arguments on the statistical tables of this essay. Such statistics alone can seldom lay bare the causes of phenomena. A given economic fact is the result of numerous complex forces, many of which are in a state of constant variation and react one upon another; and of these forces only a few can be adequately described by the method of statistics. Consequently these few are often quoted as if they were the only active causes, whereas the effect attributed to them is probable only on the assumption that all other causes remain unchanged or suspended. This assumption, though often a necessary preliminary step in an economic inquiry, should always be followed by some estimation of the degree in which those other forces have actually changed. To take an example from the subject of this essay, it is common but unscientific to ascribe a rise in the price-level altogether to a concurrent increase in the production or circulation of gold without inquiring whether there have not also been changes in such factors as the volume of trade and the extent of credit transactions, both of which exert considerable influence on the money demand and supply, and therefore on the purchasing-power of the standard. It is still more reprehensible to connect causally the extension of labour legislation during a certain period of rising prices with the higher index numbers without consideration of the many other agencies that usually operate to determine the general average of prices. Statistics, even when compiled accurately, though often absolutely necessary for a complete solution of a problem, do not in themselves provide that solution, but are to be used in conjunction with evidence of other kinds.

J. HIGHT.

Canterbury College, 28th November, 1911.

CONTENTS.

The Tables.

(See p. 50 for contents.)

Review of the Tables.

List of Diagrams.

PREFATORY NOTES.

Principal Political and Economic Events in the History of New Zealand.

1642. Discovery by Tasman.
1769. Captain Cook landed.
1791. Discovery of the Australian whale-fishery.
1792. Sealing began.
1800. Whaling, sealing, and timber industries proved to be profitable.
1807–9. Regular timber trade established.
1811–20. Sealing industry at its height.
1813. Flax trade began.
1814. Arrival of missionaries, with horses, oxen, poultry, sheep.
1827. Dockyard established at Hokianga, west coast of North Island.
1829. Shore whaling established.
1830. Pork and maize exported.
1832. Flax trade ceased.
1833. British Resident appointed.
1836. 100 ships visit New Zealand during the first half-year.
1837. Hokianga completed its eighth ship.
1838. Whaling and sealing dwindled to forty ships.
1839. Letters patent authorized the Governor of New South Wales to include within the limits of that colony any territory that might be acquired in New Zealand.
First wool exported.
1840. First body of immigrants arrived; British flag hoisted.
Treaty of Waitangi signed; Native chiefs acknowledge British sovereignty.
Population—Maoris, 100,000; whites, 2,000.
1841. New Zealand proclaimed independent of New South Wales.
1845–46. War with the Maoris.
1846. New Zealand granted representative institutions.
1848. Representative institutions withdrawn. Otago founded.
1850. Canterbury founded.
1852. Representative institutions regranted. New Zealand divided into six provinces.
1856. Responsible government firmly established.
1857. First payable goldfield discovered.
1861. Great gold-discovery in Otago.
1860–63. Gold-export rose from £18,000 to £2,500,000.
1860–70. War with the Maoris.
1861. Incorporation of Bank of New Zealand.
1863. First railway opened for traffic.

1864. Seat of government transferred from Auckland to Wellington.
1866. North and South Islands connected by cable.
1870. Initiation of Vogel's public-works scheme.
1874–76. Land-boom in New Zealand.
1876. Abolition of Provincial Governments.
New Zealand connected by cable with England *via* Australia.
1878–80. Collapse of the land-boom.
1882. Frozen meat first exported.
1885–89. Period of great depression.
1892. Land for Settlements Act.
1894. New Zealand Government assists the Bank of New Zealand.
Arbitration and Conciliation Act.
Advances to Settlers Act.
1898. Old-age Pensions Act.
1899. Rapid development of butter and flax industries.
1900–1. Rapid development of cheese industry.
1907. New Zealand proclaimed a Dominion.

Growth of Population.

The area of New Zealand is 104,750 square miles, and the following table exhibits the growth of population from 1860:—

		Quinquennial Increase. Per Cent.	Population to the Square Mile.
1860	79,711	...	0·8
1865	190,607	139	1·8
1870	248,400	30	2·4
1875	375,856	52	3·6
1880	484,864	29	4·6
1885	575,226	18	5·5
1890	625,508	9	6·0
1895	698,706	12	6·7
1900	768,278	10	7·3
1905	882,462	15	8·4
1911	1,008,407	12	9·7

Population of Principal Centres in 1911.

Auckland...	102,676
Wellington	70,729
Christchurch	78,442
Dunedin	64,237

CHAPTER I.—HISTORICAL INTRODUCTION.

The Discovery of New Zealand.

It is scarcely a century and a half ago since Lieutenant James Cook first landed on the shores of New Zealand, and returned with definite tidings of a land in the far southern seas peopled with a strenuous but hostile people. As early as 1642 Abel Tasman had already visited but not landed upon the coasts; but the memory of his exploits had almost faded from the public mind, and was revived only by the more thorough investigations of his brilliant successor. But no tide of emigration flowed in this direction, and almost another half-century elapsed before even the boldest adventurers visited the shores, intent upon those profits which accrue from even the most rudimentary form of international trade.

It is of some of the commercial aspects of this country that I wish to speak—this country which, in spite of many suggestions for change, still bears the peculiarly inappropriate name given it by the Dutch in 1643. But if respect for the great achievement of Tasman has not hallowed that name, usage certainly has; and every year, by increasing the political, social, and commercial bonds between New Zealand and the world at its antipodes, adds yet another reason for retaining a name whose very inaptness renders it the more striking.

New Zealand as a Political Unit.

The political term "New Zealand" comprises a number of islands, two of which, bearing the prosaic designations of the "North Island" and the "South Island," completely overshadow all the rest, having a combined area of 103,000 square miles out of an aggregate area of 104,750 square miles. The South Island is somewhat larger than the North Island, its area being 58,500 square miles, as against the North Island's 44,500. For the purposes of comparison, it is interesting to note that the area of the United Kingdom is approximately 121,300 square miles. The population of New Zealand is one million, that of the North Island slightly preponderating. The foreign trade is now nearly forty millions annually, while the national debt (exclusive of an aggregate municipal debt of twelve millions), often no mean index of a colony's development, has reached no less a sum than £81,000,000, or £78 per head of population.

As my special object is to trace the general level of prices in New Zealand, and to compare it with the corresponding level in other countries, I shall give only a brief outline of the commercial and political history of New Zealand up to the time that New Zealand was favourably regarded as a field for colonization.

One point I must, at the outset, make clear. New Zealand is, geographically speaking, at the very centre of the water hemisphere of the globe. Around it could be described a circle embracing

within its limits about nine-tenths of the water of the world. There is thus no other land of such magnitude, and capable of such development, which is so far removed from all those influences that tend to augment population and stimulate trade. The spirit of adventure must indeed have united with the more egoistic motive of trade to draw men so far from the beaten paths of commerce, and decades had to roll away before the sails of the trader were supplemented by the houses and fields of the colonist. Hence it was that, though discovered in 1642, and rediscovered in 1769, New Zealand, until the closing decade of the eighteenth century, remained but a name void almost of any connotation except that of geographical location. Even then it might have remained in comparative obscurity and neglect had there not been within twelve hundred miles a base and a stepping-off place for adventurers. This was the island-continent of Australia, which had been utilized as a field for colonization and as a convenient receptacle for the convicts of the Mother-country from 1788.

British Sovereignty proclaimed.

From the mother-colony of New South Wales, traders, attracted by the wealth of the whale and seal fisheries, came to New Zealand as early as 1790. From that time trade gradually increased, attracting adventurers of many kinds, but for years New Zealand remained politically and judicially a "No Man's Land." But a flourishing trade cannot coexist with lawlessness; so in 1823 an Act of the British Parliament extended the jurisdiction of the Courts of New South Wales over all British subjects in New Zealand. In the internal affairs of the country, however, neither the Imperial Government nor that of New South Wales interfered. There the Maori tribes held undisputed sway. But the arrival of missionaries, and the despatch of colonizing expeditions from England, the fear of annexation by France, together with conflicts between colonists and Maoris, and the more deadly feuds between the tribes themselves, at length induced the British Government to enter into treaty with the Maori chiefs. The treaty of Waitangi, by which the Maoris ceded sovereignty to the British sovereign, was signed on the 6th February, 1840; and on the 21st May the sovereignty of Great Britain over the islands of New Zealand was formally proclaimed. That expedition, the objective of which was Akaroa, was forestalled by only two days. The settlers, however, remained, and within view of where I am writing there flourish beautiful weeping-willow trees, descendants of those which the French pioneers had brought with them from St. Helena as mementos of their beloved Emperor, now doubly significant as mementos of unfulfilled aspirations of Empire as well in the Southern as in the Northern Hemisphere.

I must now add that in 1841 New Zealand was proclaimed independent of New South Wales, and return from this digression into politics to the commercial aspect of the question.

The Dawn of Commerce.

I have said that it was the wealth of our whaling and sealing fisheries that first turned the tide of trade in our direction. In 1791 the Australian whale-fishery was discovered, and in 1792 sealing began. In 1794 a boat arrived in New Zealand to load timber for the East India navy, and by 1800 it had been clearly proved that New Zealand and the New Zealand waters afforded a profitable field for the whaling, sealing, and timber industries. White-pine and kauri were the timbers most prized. In 1813 a trade was developed in the so-called New Zealand "flax," a species of lily more correctly known as *Phormium tenax*, the leaves of which produce a strong fibre, much prized for the manufacture of twine, rope, matting, &c.

By 1827 a dockyard had been established at Hokianga, on the west coast of the North Island, eight ships being built there by 1837. Pork and maize were added to the exports in 1830; but whaling and sealing began to decline. By 1838 the industry was almost dead, only forty ships being engaged therein. Settlement, however, was progressing, and the treasures of the land rather than those of the sea were the most sought. In 1839 wool first figured among the exports. The population then consisted of about 100,000 Maoris and 2,000 whites. A rude currency had developed under the stress of commercial necessity. Rum, flax, whalebone, American dollars, Spanish dollars, Mexican dollars, rupees, and pagodas circulated freely, along with various English coins and promissory notes issued by trading firms.

The Resources of the Country.

The country itself was singularly deficient in those commodities which are generally regarded as essential to the existence of even a moderate degree of civilization. It contained no cereals; its flora produced no fruit and but few roots that could afford sustenance to man; its principal quadruped was a black rat; its birds and fish alone were numerous and nutritive. But even the birds were fast diminishing. The gigantic wingless moa was extinct before the white man touched the shores; but wingless kiwis and flightless wekas and kakapos still abounded in the more secluded spots; the pukaki still haunted the swamps; the tui and the bell-bird swarmed in the forests, and the mutton-bird on the southern shores. The shark and the eel were as accessible as they were highly prized; while barracouta, hapuka, flounder, sole, and dog-fish added a welcome variety to the conventional bird or fish diet. Yet even the birds and the fishes did not suffice for a race which, in its country of origin, had probably enjoyed a much more varied diet. Human flesh was added to the menu, and cannibalism, with its necessary concomitant intertribal warfare, added yet another terror to an already precarious existence. The

absence of iron and copper (or what is virtually the same—the ignorance of their presence) effectually prevented the glimmering spark of civilization from bursting into flame.

European Animals and Cereals introduced.

The first relief which intercourse with the outer world brought was the introduction of the pig, supposed to have been liberated by Captain Cook about 1769. Then, on the arrival of the missionaries in 1814, horses, oxen, sheep, and poultry were introduced, and throve wonderfully. Cereals followed, and found both soil and climate admirably adapted for their production.

Organized Colonization.

Gradually it dawned upon the more intelligent of the British nation that here was a land wonderfully rich in the great natural resources of soil and climate, awaiting only the advent of an industrious race to convert it from an inhospitable country, peopled by jarring and cannibalistic tribes, to a land capable of supporting a much larger population in comfort and perhaps with some degree of luxury. Its development, however, was retarded by that pessimistic spirit so tersely expressed by Disraeli in 1853, when he spoke of "these wretched colonies," destined to become independent when they grew up, and till then hanging "like a millstone" around the neck of England. The first organized body of emigrants sailed from England in 1839, and arrived in New Zealand in 1840. Expedition followed fast upon expedition. Wellington was settled in 1840, New Plymouth in 1841, Nelson in 1842, Otago in 1848, and Canterbury in 1850. By 1855 responsible government had been granted to New Zealand; while in 1857 the first payable goldfield in the colony was discovered in Nelson—a discovery which, owing to the bent it gave the national mind, was fraught with momentous consequences for the future of New Zealand. In 1861 there was discovered in Otago a goldfield of such richness that, while the sturdy Scottish settlers by whom Otago had been colonized were debating whether it was wise to permit the "new iniquity" to appropriate the lands which the "old identity" had colonized, the matter was settled by the sudden influx from Australia of thousands upon thousands of that "iniquity"—the flotsam and jetsam of the mining world. The even tenor of the political, commercial, and social life of New Zealand was rudely disturbed. The population of the colony, which in 1859 had been only 59,000, had jumped to 126,000 in 1862.

It is at this point—1861—that I take up my review of the history of the price-level in New Zealand.

CHAPTER II.—GENERAL SCOPE OF THE INQUIRY.

Changes in the Purchasing-power of Gold to be measured.

The nature of the problem I have undertaken to investigate is briefly this: To indicate the changes in the purchasing-power of gold from 1861 to 1908; to trace these annual fluctuations to their sources, and to compare them with contemporary fluctuations in England and elsewhere; and to state as accurately as possible the nature of the bonds of union existing between the several price-levels.

The Method adopted: Index Numbers.

To achieve this end I shall employ the method of the index number. I shall explain in further detail in a later chapter the exact means adopted to obtain such a number. At present the use of such a method requires little justification. It is used in the measurement of price-variations by the "Economist," by the Board of Trade, and by such statisticians as Sauerbeck and Falkner, with results so similar as to give the impression of a degree of accuracy in the immediate neighbourhood of the absolute.

Roughly, an index number is obtained by taking the average prices of a number of articles the prices of which are noted at regular intervals during a certain period, which is called the standard period. The average price thus obtained of each article over this standard period serves as the standard price, and, for convenience sake, it is stated as 100. All individual prices of the article are compared with and stated as percentages of this standard price. Thus, to obtain the index number of wheat the following method was adopted: The price of wheat was noted at regular intervals four times each year. The average of these four prices was the average price of wheat for that particular year. These annual average prices were added together for every year of the decade 1890–1899, and the sum divided by ten. This gave a price (3s. 5d.) which may be regarded as the standard price of wheat, and which for convenience sake is called 100. The average price of wheat for the year 1895 was 2s. 11¼d. per bushel. Regarding the standard price as 100, the price in 1895 must, for the purpose of comparison, be regarded as $\frac{\text{2s. 11¼d.}}{\text{3s. 5d.}} \times 100 = 86$. In the same way, percentages are obtained for the average annual prices of all other articles. The average of the standard prices of all the articles is, of course, 100; and if the average of all the other percentages be taken and compared with this 100, the result should indicate whether, judged by the standard, the average level of prices has risen or fallen—that is, in so far as the articles chosen can be regarded as typical of commodities and services in general.

Practical Application of Index Numbers.

Now, it is obvious that if we could prepare a tabular standard so wide-reaching and representative that it would indicate the fluctuations in the general level of prices, we should have at our disposal an instrument of great practical as well as theoretical advantage. Theoretically, it would enable the economist and historian to compare the purchasing-power of money in different places at the same time, or in the same place at different times. It would thus be an accurate index of the appreciation or depreciation of the standard of value. It would enable statesmen and publicists to ascertain more accurately the movements in the general level of prices; and, by ascertaining what individual commodities or groups of commodities tended to vary most in price, to judge what class of people would be most affected thereby. Practically, it might be made to serve as a valuable guide in the fixation of the actual amount of money to be paid as rents, pensions, annuities, and interest, such amounts increasing or diminishing *pari passu* with a rise or fall in the general price-level. In short, in many obligations extending over long periods, much advantage might be gained by introducing the method of the index number to regulate the amount of the obligation so that the debtor shall pay such a sum as will represent an amount of commodities equal to the amount represented by the sum he borrowed. It would thus serve to eliminate that industry-wrecking element of undeserved losses and unmerited gains, and to allow industrial enterprises to be undertaken freer from that element of blind chance that can ever be the case under present conditions. It could serve as a guide to the financier in search of a field for investment, and to the emigrant in search of a home. If compiled over wide areas, and in many countries, it should do much to facilitate the solution of the great problem of determining the causes of fluctuations in the general level of prices. If, in addition, it could show what article or group of articles has the greatest tendency to fluctuate in price, it should do something towards diminishing the frequency and mitigating the severity of industrial crises.

Such are a few of the advantages to be derived from the use of an official index number, if the *vis inertiæ* of established practice could be so overcome as to secure its adoption. A committee of the British Association for the Advancement of Science recommended the compilation of such an official index number, its use to be optional. It was felt that were such a number compiled, and the data on which it was based made public, there would be a disposition—increasing as familiarity with the principle increased—for those contracting obligations over long periods to take advantage of it. So far the recommendation has not crystallized into fact.

Some Objections to their Use.

It should be noted, however, that it is in connection with obligations extending over long periods that the advantages of regulating the amount of obligation by reference to a tabular standard would be most obvious. Over short periods, any such compulsory regulation would be intolerable. Walker ("Money," pp. 159–63) says that the scheme "would never do for Yankees." In ordinary commercial transactions the advantage of knowing beforehand the exact amount of gold to be paid or received on a given date far outweighs any disadvantage likely to arise from any appreciation or depreciation of the standard of value. To adopt the scheme for transactions extending over short periods, and to readjust recurring obligations at frequent intervals, would involve an unwarrantable increase in the labour of book-keeping, and would render impossible that great desideratum—the ability to cast up at a moment's notice the extent of one's obligations.

Another objection urged is that while it secures to the creditor the payment of the same volume of goods as was originally represented by the amount of his debt, the marginal utility of those goods may have fallen—a common phenomenon in an era of great industrial progress. In short, the standard of living may have risen; but, owing to the manner in which the debt has been repaid, the creditor will be compelled to remain at the old standard. Such is the opinion expressed by Kinley ("Money," p. 278); and it seems true that, while those who have fixed nominal incomes or wages would have their purchasing-power increased in a period of falling prices, no such advantage would accrue to the creditor. He would, however, be physically no worse off, but comparison would render him psychically so. The position would be reversed during a period of rising prices. When, however, Kinley proceeds to elaborate his argument on psychical efficiency (p. 279), I am unable to assent to his conclusions. He says, "The loan of a bicycle fresh from the shop in 1895 could not be repaid in 1904 by the return of a similar bicycle, made at the same shop and at the same expense, because fashion in bicycles has changed, and the element of psychical efficiency in their utility and value has largely disappeared." Taken literally, this is quite true; but surely the argument implies that debts are to be repaid in kind. Suppose, in 1895, I buy a bicycle for £20, and that in 1904 I pay for it. The general level of prices having meanwhile fallen 5 per cent., I discharge my liability by the payment of £19 sterling. Does this imply the loss to the cycle-dealer of any psychical efficiency? If he expends the £19 on commodities other than cycles, it may even imply a gain in psychical efficiency—*i.e.*, if those commodities have fallen in price owing to something other than loss of psychical efficiency. If he expends it on bicycles, there need be no loss, for bicycles have probably fallen in price owing to loss of psychical efficiency; but if they have fallen in price, then he can obtain the greater number for less money. And

if this fall has been greater than that in other commodities, then the payment to him of £19 will probably represent not a loss but a gain in psychical efficiency. If I have read Kinley aright, then his statement is true only if commodities are to be paid for by the return of the same amount of exactly similar articles. But this is not what is contemplated by the advocates of the tabular standard.

Index Numbers and New Zealand Legislation.

Though no official index numbers have yet been compiled in New Zealand, there is an increasing field for their use. The nature of much of our recent legislation has been such as to make the accurate determination of fluctuations in the purchasing-power of the medium of exchange a matter of great importance. The Old-age Pensions Act, the various superannuation schemes, the Land for Settlements Act, the Advances to Settlers Act, and the Arbitration and Concilation Act—the operation of all these is intimately bound up with variations in the purchasing-power of gold. Our national debt, which now stands at £81,000,000, and which, owing to a policy that appears to command the approval of the country, must continue to increase, will press lightly or heavily upon us according to the direction in which the purchasing-power of gold varies.

The principal feature of the various Acts and obligations mentioned in the preceding paragraph is the obligation of recurring payments, extending over long periods, which they impose either on the individual or on the State. It is plain that the burden and the benefit of this obligation will vary with every change in the purchasing-power of gold; but it is essential to the complete success of all such schemes that neither the burden nor the benefit should be increased by any cause other than the mutual consent of the contracting parties.

Statistical Treatment necessary.

Nearly all these Acts are a result of the last fifteen years of legislative activity; their effects have but partially manifested themselves, and are but imperfectly known. No systematic attempt has yet been made to analyse these effects, to separate the inevitable from the merely accidental, and to disentangle them from the effect of other causes. Many inquiries have been made by statesmen, statisticians, and publicists as to the effect of these Acts, but so far no satisfactory answer has been given. Most of what has been written has been tinged either with the exuberant zeal of the social reformer or with the gloomy predictions of the disciple of *laissez faire*. Many who have spoken and written have done so from theory, reinforced by the powerful directing animus of social prejudice.

I have said that the success of these schemes turned essentially upon the nature of the variations in the purchasing-power of gold. Now, it is along these very lines that no systematic investigation

has been made. The study of facts has been wanting; that of mere surface indications—involving, as they do, the personal equation—is quite insufficient. Statistical treatment, and, above all, discussion based on price statistics, have been absent. The successful administration of these schemes demands that accurate answers should be obtainable to such questions as: Have commodities advanced in price? What commodities have been affected most? What classes have been most affected by variations in the purchasing-power of the standard of value? The repeated amendments in these laws reveal an active dissatisfaction with their results; but reform must, of necessity, be of the nature of chance, unless based on a careful and elaborate statistical inquiry, and unless the fast-accumulating mass of data, in which the mind of the casual inquirer drifts chaotically, is subjected to rigid statistical treatment, and the course of general tendencies laid bare. Any mere theoretical treatment without reference to statistics must fail to carry conviction. In the words of Sir Robert Giffen, "A theoretic teacher may trace out tendencies or forces on paper, but the real world question must be dealt with; and in the measurement of tendencies or forces, statistics are absolutely required" ("Statistical Society Journal," vol. 45, p. 252).

Let us now descend into greater detail, and examine some of these schemes with reference to the manner in which their effects might be varied by alterations in the purchasing-power of gold.

The Old-age Pension.

The Old-age Pensions Act was passed in 1898, and since that year various superannuation funds have been established. These Acts provide for the payment of fixed sums to specified persons on their attaining a certain age. The number of persons affected by these Acts is rapidly increasing, and as the system of national annuities has been adopted by Parliament, their number will be vastly increased; and within a few years the Government will be face to face with a financial problem of great magnitude. Under the Old-age Pensions Act there is no contribution by the beneficiaries; a certain fixed annual sum is guaranteed them. But if gold becomes depreciated, the purchasing-power of the pension is proportionately reduced, and a demand is almost certain to be made for an increased pension. This is what actually occurred in 1905, when Parliament, owing to the alleged rise in prices, and moved by a collective appeal of the old-age pensioners, raised the pension from the £18 level of 1898 to £26 per annum. The important points are that Parliament had no evidence before it of the exact increase in the cost of living, and that it acted on no definite plan. What it will do if the cost of living falls appreciably is a matter of speculation. Any political party that retrenches at the expense of the needy is very apt to incur odium; yet, as retrenchment is just as necessary and just as equitable as increase,

such retrenchment or such increase could be regulated in an enlightened manner by reference to carefully compiled index numbers.

Similar difficulties could arise under the various superannuation schemes, already embracing every department of the Civil Service and likely to become universal, whereby fixed annuities are guaranteed to the widows and families of the contributors, and to the contributors themselves on their reaching a certain age. The financial soundness of these schemes might be imperilled by a prolonged period of depressed, following upon a similar period of inflated, prices. On the other hand, a depreciation of gold might render this pension quite insufficient to afford the necessaries and decencies of life.

Land for Settlements Act.

Under the Land for Settlements Act the Government purchases large estates, subdivides them, and leases them at a fixed rental to settlers for a term of years. Now, it is quite conceivable that over a long period gold might become greatly appreciated, and hence might arise a great difficulty in collecting rents. If, however, the rent were based on the level of prices (either of general or of agricultural produce) it might be made to vary with the exigencies of the commercial market.

Advances to Settlers Act.

There is possibly a similar solution of difficulties which may arise in the operation of the Advances to Settlers Act, which authorizes the issue of loans for terms of thirty-six years at a (constant) fixed rate per cent. during the whole period.

The Arbitration and Conciliation Act.

The Industrial Arbitration and Conciliation Act, which has placed the regulation of wages in most trades in the hands of Councils and a Court, has created a situation that demands a full knowledge of price-movements, in order to secure an equitable adjustment. So far these bodies have had to decide conflicting statements about the advance in the cost of living; but there has been no accurate statistical treatment of the subject, to show how much of this advance is due to increased cost of the necessaries of life, and how much to a rise in the standard of living. A decision based on such statistics would appear more satisfactory to both parties than is at present the case. An amicable solution of the problem will be less likely should gold become much appreciated, with a consequent decline in profits. This is almost certain to cause the employers to demand a reduction in wages. An accurate index number of prices would enable this operation to be performed in a rational, if not in a frictionless, manner.

Such are a few aspects of recent legislative activity affecting in a most intimate manner the prosperity and happiness of the com-

munity. Initiated during a period of rising prices and rapidly increasing national wealth, these laws have not yet been tested by depression. This, however, is only an additional reason for the exercise of the greatest care, and the application of the most rigid statistical methods.

CHAPTER III.—THE DEFECTS OF THE PRESENT STANDARD OF VALUE.

The Problem of Price.

The problem of price is perhaps the greatest problem of practical life. The whole history of civilization has been in a measure the history of prices. Its advance has been roughly indicated by the increasing ease with which mankind has acquired the necessaries and increased the luxuries of life. For the vast majority of the human race the struggle has ever been to adapt means to ends, to extract the greatest possible utility from the disposable spending-power. The struggle has been simplified by the adoption of a common medium of exchange; but, so far, no medium has been devised that has the same general purchasing-power from one year to another, much less from one generation to another. What we actually find is that the price of the sovereign, or, more correctly, the weight of the sovereign in grains of gold, is fixed; its purchasing-power, however, varies with every change in the general level of prices. It is, therefore, a most unsatisfactory because a most unreliable standard of deferred payments and deferred purchases; but no better standard has yet received the approval and acceptance of civilized races.

Those who receive fixed amounts of gold for services rendered—such as (*a*) the wage-earning class, which is in most countries an ever-increasing class; (*b*) those whose remuneration is partly fixed by custom—*e.g.*, lawyers and doctors; (*c*) the sellers of commodities —*e.g.*, beer—the prices of which are regulated by custom; and (*d*) those whose duty or right it is to pay or receive fixed sums at stated periods—*e.g.*, pensioners, lessees, lessors, borrowers, and lenders—all these are closely affected in different degrees by a change in the level of general prices. The degree in which they are affected depends, of course, upon the extent to which the prices of the individual commodities they use vary. Taking into account the different character of the consumption of different classes, and the fact that the degree of price-change varies from commodity to commodity, we see that it is possible for the general level of prices to remain unaltered, and yet for the interest of some of the above-mentioned persons to be affected beneficially or injuriously; while, on the other hand, the general level of prices may change without any injury or benefit accruing.

Evil Effects of Variations in the Standard of Value.

The particular evil caused by variations in the value of the medium of exchange is not that there may be a period of high prices, or one of low prices. In truth, there is no such thing as a permanently high or low price-level. Prices are only high or low by contrast with their state at other times. A uniform level of prices, high or low, in reference to some standard is no evil once the body social and political has become adjusted to it. Were it possible, by legislation, custom, or otherwise, to secure the permanent immutability of individual prices, the production of a commodity would decline or altogether cease as soon as its cost of production rose relatively to that of other commodities. It is, however, the change, the movement from one level to another, that kills, by the falsifying of those anticipations which, formed in the past and reaching forward to the future, seem elements inseparable from highly organized commerce. These changes transfer value from one social group to another, and the good and evil results of such transfer will depend largely upon the group which benefits by the change. A slight reduction in the purchasing-power might have grave physical and moral effects on one group, while conferring but little additional benefit on another.

If these periods of change be not too prolonged in their movements, or too abrupt in their nature, they may even, on the whole, do good. Thus a rise in the price-level will benefit producers—at least, temporarily—though at the expense of non-industrial groups; and the extent to which the latter would suffer would vary according to the degree in which any action of theirs could compel the former to share the profits which (other things being equal) increased prices naturally bring.

On the other hand, a fall from one level to another benefits the creditor or non-industrial class, and this benefit will be enjoyed just as long as that class can resist the pressure of the industrial class to reduce interest and wages. Falling prices also may indirectly benefit a nation by stimulating invention, and by teaching the lessons of an enforced economy.

Experience, however, seems to prove that a long period of falling prices checks the activity and unnerves the hand of the manufacturer, who cannot adjust the cost of production with the facility with which rising prices adjust his profits. If this leads those who direct the producing-power of the community to restrict their operations, then the community at large must restrict its consumption. Hence the cruel anomaly of "hard times" going hand-in-hand with man's more intimate knowledge of, and increased command over, the forces of nature.

These periods of commercial stagnation must be ascribed to subjective as well as to objective causes. Objectively, we have such factors as fluctuations in the supply of the media of exchange; subjectively, we have the peculiar proneness of man's mind to periods

of elation and depression. It is this subjective factor that is being more and more realized of recent years. We have its manifestation in those societies lately formed in America for the purpose of promoting the return of good times, and we had the very same sentiment enunciated in New Zealand by that brilliant though somewhat reckless financial Minister, Sir Julius Vogel, who, in the depths of the great social depression of the "eighties," loudly proclaimed, "This is the very worst time for you to be howling about your losses." There seems no doubt that increased knowledge of the psychology of these abnormal social states will do much towards diminishing their frequency and mitigating their severity.

The absence of this stability, the failure of the unit of purchasing-power to exchange for an amount of commodities which will always afford the same physical and psychical satisfaction, has been the root of an incalculable amount of social distress. It has served to inspire those schemes which have as their purpose the amelioration of human conditions by the simple but crude and unscientific method of the abolition of money.

Variations in Relative Prices.

That individual prices do, and must, vary relatively to each other is inevitable; improved processes of manufacture, and fluctuations due to the exigencies of nature and the dictates of fashion, are factors which will never be absent from industrial and social life. The purchasing-power of gold, measured in individual commodities, is therefore liable to fluctuations of every degree of severity. Some of these fluctuations will be in one direction and some in the other, according as the commodity has fallen or risen in price. When, therefore, we group all the articles together, and take the general level of prices, the fluctuations in one direction will serve to counterbalance those in the other, and the result will be a variation in a certain direction. The result may, indeed, show no variation whatever; but such a case must be of rare occurrence, and will depend on other factors—*e.g.*, upon the interval between the times at which the price observations are taken, and upon the number and nature of the articles included in the calculations.

Dependence of the Price-level upon the Volume of Media of Exchange.

Not only do prices of goods vary relatively to one another, owing to fluctuations in demand and in the circumstances of production, but it is generally considered that prices as a whole rise and fall according as the media of exchange expands or contracts in volume. This expansion or contraction in the volume of the media of exchange acts universally over the field of commodities. This theory really implies that, if there were an unvarying demand for all classes of commodities, if there were no increase in the number of commodities exchanged, if barter were absent, if such social conditions existed that the rapidity of circulation of the

media remained constant, and if there could be eliminated all causes tending to affect the relative ease or difficulty with which the commodities could be produced, then the price of every commodity would rise or fall in an equal degree with the expansion or contraction in the volume of the media of exchange. Though these conditions are never realized, and are impossible of realization, yet it seems undoubted that an increase in the media of exchange, unaccompanied by an equal increase in the amount of commodities, will, other things being equal, raise the general level of prices. All individual prices may not, probably will not, rise; but it is certain that the general level will.

Conclusions.

Broadly speaking, therefore, it is these two great factors—the tendency of individual prices, owing to various causes, to vary relatively to one another, and the expansion or contraction in the volume of the media of exchange—it is these two factors which make the problem of price so complex, and which are the sources of most of the defects of gold or any similar article when acting as the standard of deferred payments. So complex is this problem, and so potent of evil are these variations in the purchasing-power of the standard, and so necessary is it for the harmonious development of social and industrial life that these variations be either eliminated or compensated, that it has been well said that "the inquiry into the variations in the monetary standard is probably the most important problem, or group of problems, in the wide field of economic science" ("Statistical Society Journal," vol. 50, p. 150).

The problem is, indeed, a wide one, including, among many others, such questions as the causes affecting the production of the precious metals; the financial, social, and moral factors which determine the ratio of gold or silver to the whole mass of the media of exchange; the causes affecting the amount of that media which is necessary at any given stage of industrial or social development; the causes determining the relative variations in the prices of commodities, and the accurate determination of such industrial variations, or of the variations in the general level of prices. It is to this last problem that I shall address myself in detail in later chapters.

CHAPTER IV.—THE CONSTRUCTION OF A TABULAR STANDARD.

The Number of Articles used.

Though the general idea of the index number is simple, yet when we descend to details we find the compilation of such a number beset with difficulties. The ideal index number can be obtained

perhaps only by the inclusion of all commodities. This course must at once be dismissed as impracticable. We are thus forced to content ourselves with including a fairly large number of articles —say, from forty to fifty—in general use. It is obvious, however, that the more articles we include the more faithfully does the result reflect the general movement in prices; yet for all practical purposes there comes a point at which the labour involved by the inclusion of more articles is not compensated by the increasing accuracy of the results. The law of diminishing return operates with rapidly increasing intensity.

The Nature of the Articles included.

Given, then, that it is necessary to include in the tabular standard a limited number of commodities only, the next question for discussion is, What commodities shall we include? The answer must depend upon the purpose for which the index number is to be used. If the object is to represent the variation in the purchasing-power of the income of a certain class of people, then it must include those commodities which bulk most largely in the budgets of expenditure of that class. Thus if we desire to ascertain the variation in the purchasing-power of the income of professional men we should include most of the commodities in the budgets of the labourer and artisan, but others in addition, for man is roughly similar in his tastes but not in his means of indulging them. As, however, my object is to trace the movement in the general level of prices within a well-defined area, I have endeavoured to select those which would be considered thoroughly representative of the production and consumption of the country.

Raw Materials and Manufactured Goods included.

The question whether both raw materials and finished products should be included must depend ultimately upon two different factors. In the first place, it must depend upon the accessibility of prices. If we cannot obtain fairly accurate prices of a commodity, then, however necessary it may be to include that article from the point of view of theory, its actual inclusion is quite impossible. In the second place, the question must be decided by reference to the purpose for which the index number is to be used. If it is to be used to show the movement in raw materials alone, or in finished commodities alone, then those products alone must be used. If, however, the object is to show the variation in the purchasing-power of gold in respect to commodities generally (in so far as we can give any definite meaning to that phrase), due account must be taken of both classes of commodity.

But the settlement of this question only raises others. In what ratio should these articles be associated? What constitutes a raw product? Undoubtedly wheat, iron-ore, and wool are raw products, but what of flour and bar iron? In fact "raw" is merely a relative term. Yet although it is difficult in every case to draw a strict and logical line of demarcation between raw and finished products, it is practically possible and convenient to regard certain articles as raw products. Thus we may regard cereals, beef, mutton, pork, and wool, and perhaps butter and cheese, as raw products, in the sense in which we spoke above, when we said that the price of raw products did not show the same tendency to decline as was manifested by finished products.

The other question, What ratio shall the number of raw products included bear to the number of finished products? must be answered by reference to the commercial and industrial life of the country in question. Where the energies of the people are engaged mainly in the agricultural and extractive industries it is manifest that considerable influence must be allowed to raw products. It must, on the other hand, be remembered that if a country does not manufacture many commodities it has at least to import them, for everybody is a consumer, whether or not he is a producer. It must also be borne in mind that New Zealand has been an extensive borrower in the world's money-markets. We have a public debt of almost eighty millions, on which over two millions are paid annually in interest. This implies that the value of our exports, which are almost wholly raw products, exceeds our imports—for the greater part manufactured goods—by at least that amount.

Theoretically, therefore, it would seem best to include in the list both raw and finished products; and, since it would be impracticable to select all products, to include only those which are present in the country's markets (using that word in its widest meaning) in the largest amount. It is these commodities which make the largest demands upon the media of exchange, and hence the prices of others are largely dependent upon their prices.

The Selection of Particular Commodities.

A subordinate question then arises as to the meaning to be given to the phrase "in the largest amount." Is this to mean "in value" or "in weight"? Unquestionably the former, for it is the value and not the weight or volume of a commodity which makes the demand upon the media of exchange. Of course, the value may be directly dependent upon the volume, as in the case of wheat, but in many cases—*e.g.*, work of art, curios—there is hardly any causal connection whatever. In other cases—*e.g.*, personal services—there is no possibility of any causal connection. Again, some articles are sold by length, some by weight, some by volume, some—*e.g.*, services—by duration, but all by price. The element of price is, therefore, the chief element which their process of exchange has in common.

Granted, then, that we include in our tabular standard those raw and finished products which figure highest in the records of the country's markets, how are we to ascertain what articles corre-

spond with this description. We might include only those which bulk largest in the statistics of imports and exports. If so, we take no account of those articles produced locally and consumed locally. This would mean that we take almost no account in New Zealand of wheat, oats, barley, or flour; and wheat is one of the staple products of New Zealand. To take no account of flour seems, in the nature of things, absurd. The difficulty could be surmounted by including those articles marketed in the greatest value within New Zealand. But in New Zealand we have no method of ascertaining accurately this most desirable information.

Workmen's budgets would assist us, especially if our object were to evolve an index number to determine the variations in the purchasing-power of workers' incomes. So far as I can ascertain, no one has yet undertaken the work of showing the value of all commodities marketed in New Zealand. Something has been done towards this end—we have our "Official Year-book" and our annual "Statistics of New Zealand," and from these no doubt it would be possible to make an approximately correct selection of those articles the exchange value of which in the aggregate is greatest.

An Alleged Defect of Raw Products.

The objection, however, might well be raised that if we selected only those articles which are marketed to the greatest extent within New Zealand, and selected but few in the aggregate, such a list might include too high a proportion of raw products. It is said that an index number derived from the prices of raw products fails as an accurate index of the movement in the level of prices, particularly of a movement from a high to a lower lovel. This is evidently based on the assumption that, owing to the advantages accruing from such factors in production as improvements in machinery, division of labour, specialization of industry, and production on a large scale, the law of increasing returns operates more strongly in the production of manufactured goods than it does in the case of raw materials. There is no doubt that the agricultural and extractive industries have not taken, and in many cases cannot take, advantage of such aids to the efficiency of labour to the same extent as the manufacturing industries. This disadvantage is further increased by the rise in the wages of skilled labour restricting the supply and raising the price of unskilled labour. The relative cost of raw materials has, therefore, risen, and will tend to rise as the point of diminishing returns is reached; and, as practically all the available portions of the earth are now in the hands of industrial races, though by no means yet fully exploited, it seems that this rise in the relative cost must continue unless checked temporarily by some great improvements in the extractive and agricultural arts. Indeed, it requires no effort of the imagination to reach forward to the time when the prices of raw materials may exhibit a rise coincidently

with a decline in the price of finished products. This is shown by my tables to be already the case in New Zealand, when farm products and manufactured goods are compared. Though I have referred to this matter in detail in a later chapter, I may here remark that since 1885 the former fell less rapidly, and then rose much more rapidly than the latter. A tabular standard, therefore, which included an undue number of raw materials might produce a wrong impression of the real movement in the general level of prices. If raw materials were rising, and manufactured articles falling, such a table would minimize the fall, and if manufactured articles were rising it would magnify the rise.

My tables include thirteen New Zealand products of the soil that may conveniently be classed as raw products.

Weighting.

Yet another question arises demanding a satisfactory solution. It is obvious that all the commodities in any tabular standard cannot be of equal importance. If they were, the problem would be a simple one. Thus, if we consider ham and bacon of equal importance, and find that ham has risen 10 per cent., and bacon fallen 10 per cent., we could say with truth that the purchasing-power of money has remained unchanged. But in the case of commodities such as wheat and salt, which are obviously not of equal importance, a rise of 10 per cent. in wheat would in no way be compensated by a 10-per-cent. fall in salt. It is this which gives rise to the vexed question of "weighting"—a question which is easier to raise than to answer. If we treat all articles as of equal importance, we virtually assume that all make equal demands upon the media of exchange, and that it is a matter of indifference to the consumer which article rises or falls in price. In order to overcome this difficulty, it has been suggested that the commodities be "weighted" according to their importance—*i.e.*, according to the national expenditure upon them.

In exceptional cases such a method would give an unreal idea of the depreciation of gold. Suppose, for instance, there is an article on which the national expenditure is very great, and the use of which is indispensable (say, wheat), and that through failure of the world's harvest wheat rises exceptionally high, then if we weight this exceptionally high price by the high percentage which the total expenditure on wheat bears to the total expenditure on all commodities, are our results not apt to give an exaggerated idea of the depreciation of gold as measured in commodities generally? It might, however, be urged that if the number of articles be sufficiently great the index number will not be appreciably affected by such a case as the above. If this is so, what then is the advantage of "weighting"? If the number of articles in the standard be small, then the result will undoubtedly be affected to a considerable degree. But it may be pleaded that if a few commodities,

of which the national consumption is necessarily very great, also rise exceptionally in price, then the demand for and price of other articles must fall. Unless the former commodities were weighted, the index number might fall, thereby implying a rise in the purchasing-power of money; in other words, an apparent increased satisfaction of wants. But such would be far from the truth. High prices for necessaries might not be balanced by low prices for other commodities. Those commodities would be low because the demand for them had fallen off. Weighting, then, according to national expenditure would give a more reliable index of purchasing-power.

Though such a course is theoretically sound, and theoretically advisable, yet it is a matter of great difficulty to ascertain that expenditure. It would be exceedingly difficult, if not wholly impossible, to assign correct "weights" to every commodity. Even if it were possible to do so at any time, it would be necessary to readjust those weights continually, according as the supply of, or the demand for, that particular commodity varied. It is obvious, however, that the greater number of articles, the more difficult it must be to assign correct weights. Theoretically, two articles should not have the same weight unless the national expenditure on each is the same, or, more correctly, unless they both make equal demands on the media of exchange. It might, however, be possible to arrange the commodities in groups, and to assign "weights" to each group. Thus the group representing the pastoral industry might be assigned 3 as its weight, and the cereal group 2, and the others 1. Any such grouping and weighting must of necessity be only approximately true. On the other hand, what probably serves equally as well, and at the same time gives due importance to the commodities produced in great bulk and in various grades, is the method I have adopted. It is, to take more than one variety of an article, if that article be of great importance. Thus, I have taken three cereals, and to emphasize the importance of wheat I have taken flour as well. I have sought to give wool adequate representation by including two kinds—greasy merino and greasy half-bred. Iron is represented by bar iron and galvanized iron; while meat is represented in a similar manner by beef, mutton, lamb, and bacon. Such a method combines a large amount of convenience with no small amount of common-sense. However much economists are agreed that some system of weighting is necessary for a theoretically complete tabular standard, there seems no consensus of opinion as to the best method to adopt, or, in fact, as to any method the advantages of which will outweigh its cumbersomeness. Experience, however, has tended to show that in this respect "elegantia" may be purchased, and no other benefit accrue. Weighted and unweighted tables give, for all practical purposes, substantially the same results. Finding it impossible, therefore, to assign a strictly equitable weight to each of the articles, I have assigned weights to the most important, and have left the rest—the majority—unweighted. The index numbers

so obtained show that, provided the articles are fairly representative and reasonably numerous, refinements in weighting do not produce results at all commensurate with the trouble involved.

This section may fittingly close with an extract from a report of the British Association for the Advancement of Science: "The general method to be adopted should be that of the weighted mean. In case it should be found to be impracticable to get approximate weights, a reasonably good makeshift would be found by selecting twenty important representative commodities, and averaging their variations without weighting them." This is the method I have adopted in the compilation of the main body of my tables.

CHAPTER V.—THE CONSTRUCTION OF THE TABLES.

Number of Articles included.

I have taken in all forty-five articles, and to obtain their average annual price I have taken their prices four times during the year—viz., during the first week of January, April, July, and October, or as near as possible to those dates. Of these prices I took the arithmetical mean, and called that the average annual price of that commodity. I then obtained the average price of each article over the decade 1890–99. This price I called 100. I then reduced the several annual average prices to percentages of this average decade price. The percentages representing the annual average price of each article were then added together, and the result divided by forty-five. The result is the index number for that year, and expresses the relative level of prices for that year, judged by the level during the standard period—the decade 1890–99.

Interpolation.

In a few instances I have deemed it necessary to interpolate the prices of some commodities. It occasionally happened—but only before 1874—that I could not get statistics relating to a certain commodity during the year. In interpolating I adopted such a plan as would obviate any suspicion that I was "doctoring" my tables. I examined the price of the particular commodity in preceding and succeeding years. If those prices showed a continuous rise or fall, that was strong evidence of the probability of the missing price being one of an uninterrupted series. To test this probability, I referred to similar products—products which would most likely vary in price in the same manner as the commodity whose price was missing; and if the price-movement in these commodities was in the same direction as the movement in the latter one, I presumed that the missing price would most probably vary in the same manner as the price of the similar articles in the same year. This method was applied chiefly where there was a causal connection

between the fluctuations in the prices of the two articles—*e.g.*, where both were produced from the same raw material (as galvanized iron and bar iron); or where one was raw material and the other the finished product (as wheat and flour); or where the production of both would be affected by the same causes, as by drought (in the case of wheat and oats, mutton and beef). The number of interpolated prices is very few; and though they may not be exactly accurate, that inaccuracy cannot affect the index number for the year to any appreciable extent. All interpolated prices have their index numbers enclosed in brackets.

The Standard Period.

I chose the decade 1890–99 after some consideration. At first I felt inclined to choose Sauerbeck's period of 1867–77, in order that I might be able to compare my results more directly with his. But any trifling advantage to be gained was entirely outweighed by the difficulties involved and the imperfections inherent in such a course. Insufficiency of data alone would have made such a course inadvisable. That decade is a very early period in the history of New Zealand, and the records of prices are not so complete as is desirable for a period that is to be regarded as a standard period. It is advisable, also, that such a standard period should represent a period of stable trade, neither one of undue buoyancy nor one of undue depression. Now, during the decade 1867–76 New Zealand was in its infancy not only in agriculture and manufacture, but also in the means of communication and the mechanism of exchange. The population was only 22,000 in 1867 and 300,000 in 1876. The vicissitudes of the harvests, the lack of quick postal and cable facilities, the crude methods of production, and the comparatively low degree of organization of the produce-markets, the large State expenditure, and the wild boom in land-values, all united to produce a tendency to fluctuation in prices so violent as to make that period unsuitable as the basis of an index number. The decade chosen—1890–99—is free from all these objections. Trade was stable, agriculture and manufacture had reached a high state of efficiency, and the country both politically and socially was at rest; above all it is a period over which full statistics of prices are readily obtainable. In short, it is what might be termed a normal period in the Dominion's history, and should serve as a good basis for future calculations. It has been pointed out by some economists—*e.g.*, Sauerbeck in the "Economic Journal"—that it is better to take as the standard a period of high prices, as the extraordinary movements in the prices of some articles affect the general average to a much greater extent when calculated from a low basis upwards than when reckoned from a high basis downwards. The period 1890–99 cannot be called a period of high prices. It is, however, a period of comparatively stable prices—the average for the twenty years 1886–1905 is 101.

Wellington and Christchurch Prices adopted.

Speaking now of the actual prices I have used in my table, I wish to point out some difficulties I encountered. These were due partly to the fact that New Zealand is a very young country. Her population is estimated at just over one million, and its growth—compared with that of such countries as the United States of America—has been slow. In 1861 the population was estimated at 99,000, in 1871 at 256,000, in 1881 at 490,000, in 1891 at 626,000, and in 1901 at 772,000. In other words, in 1861 the density of the population was nearly 1 to the square mile; in 1871, 2·5; in 1881, 4·7; in 1891, 6; in 1901, 7·4; and now (1911) it is 9·75.

New Zealand is primarily an agricultural and pastoral country. In 1907, out of a total export trade of £20,000,000, no less than 15,500,000 pounds' worth was agricultural and pastoral products. Hence there has been no great concentration of the population in cities. In this respect New Zealand compares more than favourably with Australia and other countries. Over half the population of New Zealand is in urban areas, but in Australia 36·21 per cent. of the people of Australia are in the six capital cities. No less than 45·41 per cent. of South Australia's population is concentrated in Adelaide, while London contains 13·6 per cent. of the United Kingdom's population. Only 7·63 per cent., however, of New Zealand's population is concentrated in her capital city—Wellington. The population is also fairly evenly distributed throughout the Dominion, that of the North Island preponderating.

In the "early days" communication between the various parts of the country was very slow. Business, too, requires time before it can call to its aid such appliances as it has at the present day. Such powerful aids to commerce as rapid communication by ship, railway, or telegraph, as banking and credit, take time to develop, especially in a new country at the antipodes of the world of commerce and civilization. The result is that there is great difficulty in obtaining reliable price-lists of those times; in fact, there is a difficulty in obtaining prices at all. In an old country there are often to be found what are popularly known as "old-established firms." With us, however, it is different. Such firms with us are extremely few in number, and the oldest extend back only a few decades. Those that are old established have not preserved their price-lists. Fortunately for the investigator, it was formerly the practice of the New Zealand newspapers to publish periodical lists of both wholesale and retail prices in the various centres. This I must acknowledge as an invaluable aid, though one does occasionally find the price of an article quoted with pleasing regularity for two or three years, and then intermitted for as long; or one finds that all prices have for some reason or other been intermitted for a period of years. It is quite evident that those that published these prices were actuated by motives quite other than that of satisfying the wants of some future inves-

tigator. I was fortunate, however, in finding that all editors did not pursue the same plan. It was seldom that they all published price-lists at the same time; and it was also very seldom that all of them intermitted publication of them at the same time. Hence by going through a sufficient number of different papers published at the same time, and as nearly as possible in the same place, it was often possible to abstract fairly trustworthy statistics of prices.

Since 1873 there has been published in Wellington the "New Zealand Trade Review and Price Current," a monthly journal of wholesale prices. The editor (Mr. Samuel Carroll) informed me that these prices are compiled with great care, on information given by leading wholesale firms. These prices are Wellington prices. Now, Wellington is geographically and politically the centre of New Zealand. It enjoys an ideal position as a distributing centre. Wellington prices, therefore, are to a great extent free from those increases due to cost of transit, interest, &c., which are incidental to prices in places remote from distributing centres. These considerations induced me to take Wellington prices for my tables. Prices in other cities differed slightly from these prices, according to the state of trade and means of communication. Sometimes these would be above, sometimes below, Wellington prices. I thought it inadvisable to use Wellington prices for certain articles for certain years, and then to use (say) Christchurch prices for the same articles for other years. Wherever it has been possible to obtain what seemed reliable prices from Wellington sources, I have done so. I have endeavoured, wherever possible, to observe this principle of continuity. I may mention that this is now not a matter of such concern as formerly. Intercommunication between the different commercial centres of New Zealand is now so regular, so efficient, and so cheap, and commerce is becoming so sensitively organized, that it is no longer possible for prices in one centre to deviate to any very appreciable extent from those in another. Still, it is well, for the sake of comparison, to adhere throughout to the prices in the one centre only.

But to the general rule that Wellington prices were taken I must state a few exceptions. While it is an undoubted advantage to take Wellington prices for all imported goods, it is not so for many colonial products. This is particularly the case with such commodities as cereals and meat. Now, Canterbury has been, and still is, the great agricultural district of New Zealand, producing approximately three-fourths of the wheat, half of the barley, and one-third of the oats grown in New Zealand. For years these cereals were almost entirely neglected in the North Island, owing partly to climatic and political conditions, but more largely to the difficulty of bringing the more heavily timbered lands of that island under cultivation. Hence their prices in Wellington not only were quoted with an irregularity that made them useless, but were in addition subject to violent fluctuations due to a scarcity caused by incomplete communication and imperfect information. With Christchurch it was otherwise. It is in the very heart of New Zealand's richest agricultural district, and the price of cereals has always been a matter of the keenest interest to the inhabitants. The local papers therefore published these prices with great regularity, and the editor of "The Press" (Christchurch) informs me that the price-reports are as accurate as ordinary care can make them.

Possessed, too, of an abundance of fertile land, easily accessible and readily cultivable, Canterbury has always produced large quantities of pastoral products. As the prices of these in the "early days" were more easily obtainable in Christchurch than in Wellington, I have therefore taken the Christchurch prices of these commodities also; in fact, in such cases the investigator must make the best use of the statistical data at his disposal. I have observed in every possible case the principle of continuity; but the nature of things demands that this principle must be subordinated to that of accessibility.

To summarize, I have taken Wellington prices for all imported goods, and for a few colonial products, but Christchurch prices for all the cereals (including flour) and pastoral products.

Wholesale Prices used.

Next arises the question whether wholesale or retail prices should be used. It is absolutely necessary that the one kind of price be used throughout. Various factors have to be taken into consideration. My object is to measure the fluctuations in the general level of prices in New Zealand. Now, retail prices are influenced largely by custom, and do not respond so readily to market changes as wholesale prices. The retail market is not so sensitive as the wholesale. On the other hand, if my object had been the measurement of changes in the purchasing-power of the income of a particular class, then I would have taken retail prices of the products most largely consumed by that class. Even, however, if no such consideration thus dictated my choice, I would still be forced to it by the fact that retail prices are unobtainable. It is impossible to obtain a series of price-lists so continuous that one can get from them a reliable and uninterrupted record of prices.

Improvement in Quality of Articles in the Standard.

I have compiled my tables over a period of nearly fifty years. It may be objected that over such a period some articles may have entirely changed their nature. This would be the case with manufactured goods rather than with raw products. The latter—*e.g.*, cereals, wool, meat—we may presume to have remained practically unchanged in quality. Even if manufactured goods have changed their quality—and the majority of those I have taken have pro-

bably changed but little—we may fairly assume that the relative importance of those goods has remained the same. For instance, even if flour has improved in quality, it is tolerably safe to assume that it has maintained the same relative position in the economy of foodstuffs as before; in other words, that the mere improvement in quality alone—which, in any case, must be slight, and when spread over long periods must have been almost imperceptible—could not have appreciably affected the demand for it—*i.e.*, the quantity consumed per household could not have been affected by the mere fact of a gradual but almost imperceptible improvement in the quality. This gradual improvement in its quality would not have caused any appreciable substitution of it for other products. Hence any fluctuations in price must be ascribed to various trade conditions, such as a depreciation of the standard of value; and it is these conditions that my tables are designed to measure.

If, however, this view of the question is an untenable one, then if we regard the qualities of some commodities as gradually improving, and do not make allowance for this improvement—and such allowance it would be impossible to make—our index numbers will, in a period when prices are falling, tend to minimize the real extent of the fall; for in consecutive years we are dealing with the price of what is an article of a quality superior to that of the preceding year. If, on the other hand, the price of this particular commodity be rising, then we are exaggerating the extent of the rise, for we neglect to make allowance for the fact that we are dealing with an article superior to that the price of which we reckoned in the preceding year. It is best, therefore, to select, if possible, only those articles the physical and psychical efficiency of which varies but little from year to year; or, if our purpose is to compare the price-level of two remote periods, then we must select those commodities the efficiency of which is tolerably constant over the intervening years. The task is a most difficult one, involving laborious statistical inquiry and the use of the historical imagination; but the only alternative is the utterly impossible one of selecting articles and making allowance for changes in quality as soon as these arise.

The Average used.

I have used the arithmetical average throughout. It may be objected that such an average is liable to be much disturbed by violent fluctuations of individual commodities, and that it gives undue emphasis to large numbers. While this effect cannot be denied, yet in practice it can be considerably modified by taking a fairly large number of articles, or by omitting from the standard those articles which the circumstances of production and demand render peculiarly liable to sudden and violent fluctuations in prices. There is the probability, also, that, in the aggregate, fluctuations in one direction will be counteracted by fluctuations from opposite causes in the other.

The Omission of certain Articles and Prices from the Tables discussed.

This omission from the tables of commodities subject to sudden and violet fluctuations in prices does not appear in all cases a permissible procedure. If these commodities are necessaries of life, and more especially if we are measuring variations in the standard of value, or of the real wages of a particular class into whose expenditure these commodities largely enter, then such an action as that of Jevons in substituting the price of cotton in normal years for its price in exceptional years is not defensible. It is somewhat more so if the purpose is the measurement of variations in the standard of value over long periods, though even then it savours of fixing beforehand upon the results to be obtained, and of adopting the requisite means to obtain them. It neglects also the important consideration that if the prices of a commodity or group of commodities of great commercial importance rise exceptionally high, the effect will (other things being equal) be a reduction in the price of less necessary commodities. Thus the inclusion of exceptional variations from the normal in one direction will be necessary to balance variation in the other. It will probably be found most convenient not to omit the exceptional prices, but to call attention to them when noting the results of a particular year.

The geometric mean, on the other hand, increases the influence of smaller numbers; or, what is more apparent, minimizes the influence of large numbers; but it is so much more tedious to calculate that it is very doubtful whether in practice its advantages would be superior to those arising from the arithmetic mean of carefully chosen articles.

The Median discussed.

There is another average easily calculated and afterwards convenient to use: this is the median—the point that has as many prices above as below it. Like the geometric mean, this minimizes the influence of exceptional fluctuations. But whereas the geometric mean minimizes the influence of the larger numbers only, the median exercises its influence upon both large and small. I have found its operation capable of being thus expressed:—

When the arithmetic mean (AM) falls much below the median (M), the numbers below the median have been exceptionally small—*i.e.*, they have deviated from the median to a greater extent than have the numbers above. In such a case the median emphasizes the importance of the larger numbers. When, however, the median falls much below the arithmetic mean, the numbers above the median have been exceptionally large—*i.e.*, they have deviated from the median to a greater extent than those below. In such a case the median minimizes the importance of the larger numbers.

The more approximately equal the deviation of the numbers on either side of the median, the more the arithmetic mean and median approximate. The arithmetic mean and the median will deviate according to the equation:—

$$AM-M=\frac{\left(\text{Sum of numbers above M}-\frac{n-1}{2}\text{M}\right)-\left(\frac{n-1}{2}\text{M}-\text{Sum of numbers below M}\right)}{n}$$

where n = the number of numbers given, and is odd;
and:—

$$AM-M=\frac{\left(\text{Sum of numbers above M}-\frac{n}{2}\text{M}\right)-\left(\frac{n}{2}\text{M}-\text{Sum of numbers below M}\right)}{n}$$

where n = the number of numbers given, and is even.

I have made use of the median in two of my tables (Tables 2B and 3A), and I shall have occasion to remark on its use and results later on.

Summary of Method adopted.

It is convenient here to summarize the methods I have adopted in order to obtain an index number. I have used forty-five articles, including raw products as well as manufactured goods; and of these articles I have taken the unweighted arithmetical average prices. My standard period is the decade 1890–99. I have also, for the sake of comparison, made use of the average obtained by the median; and in a few cases I have weighted the principal articles. The prices used are wholesale prices—Christchurch prices for the principal agricultural and pastoral products, and Wellington prices for the remainder.

Interpretation of Result.

Given, then, our index numbers for a series of years, we may fairly assume if the number for one year is higher than that of the preceding year, that there has been a depreciation of the standard of value. It may, of course, be objected that the rise, especially if it is a small one, is due to the extraordinary fluctuations in one or two commodities, and not to any depreciation in the standard of value, due to an alteration in the intensity of the demand made upon the media of exchange. It has, however, been previously pointed out that, other things being equal, exceptionally high prices for the same commodities cannot be long maintained without depressing the prices of others. Similarly a rise of the index number may occur, though some commodities have fallen in price. How the individual will be affected will depend principally upon the price-movements of those commodities which bulk most largely in his expenditure. This question is further complicated by the fact that the nominal amount of this person's income —be it wages, interest, or profit—eventually depends upon the same price-level.

Variations over Long Periods.

Though the index number of any one year will probably indicate that the proportion of (say) rise has been greater than that of fall, much more reliable results will be obtained from the index numbers of a series of years. A rise in any individual year may be due to some cause affecting commodities generally, or it may be due to fortuitous circumstances affecting individual articles. If, however, that rise has been preceded by a rise, and *a fortiori*, if it is followed by a rise, then it is reasonable to presume that such a rise is not merely fortuitous, but due to some great general cause; and, further, if on comparing the index numbers of one country with those of another, the fluctuations in the one are found to correspond in direction, and roughly in amount, with those in the other, then the probability increases almost to a certainty that these fluctuations are due to causes affecting commodities generally. It is hardly conceivable that there could be similar fluctuations in the index numbers of different countries over a long series of years, and that these could be due merely to special causes affecting individual articles. The hypothesis of special causes is particularly weak, if the index numbers of the different countries are obtained in a different manner—*e.g.*, if the commodities included in the tables differ in kind or in number.

Proposed Comparisons.

It will be my object to point out in my tables the indications of a general rise or fall in prices; and, by observing the trend of the annual index numbers over a series of years, by averaging them over regular periods, and by comparing their movements with similar contemporary movements in other countries, to speculate upon the probable general causes of their variations. More especially will the New Zealand and the English price-levels be compared, their coincidences noted, and their discrepancies, in part at least, explained. I shall also arrange the commodities in groups, and point out the coincident variations in the aggregate of the different sections; and, as New Zealand is pre-eminently an agricultural and pastoral country, the variations in the price-level of agricultural and pastoral products will be compared with the variation in the price-level of other commodities. The social and the political history of the Dominion will be alluded to, and the nature of the reaction between it and the price-level will be pointed out. Index numbers of the gold-production of the world and of New Zealand will be added; and an attempt will be made to show the effects of variation in the gold-production on the price-level. Index numbers of the marriage and the bankruptcy rate will also be included, and from them will be deduced changes in social prosperity. Finally, a general corroboration of the accuracy of the index numbers of the tabular standard will be attempted by systems

of index numbers based on (*a*) trade and shipping, and (*b*) trade and population.

Future labours will be devoted to an endeavour to ascertain more accurately the effects of the variation in prices upon the welfare of individual social groups.

CHAPTER VI.—THE COMMODITIES INCLUDED IN THE TABLES.

The Choice of Commodities.

In Chapter IV it was pointed out that the selection of articles for a theoretically perfect tabular standard was a matter of considerable difficulty. To this chapter I append a list of those I used in the computation of my tables.

It is only when an original inquiry such as this has been carried nearly to completion that the investigator realizes the true nature and extent of the statistical material at his disposal. There is the temptation at the outset to include only those articles concerning which full and reliable data are easily accessible. It is only after much research that one either discovers where to obtain the requisite data, or learns to extract from a number of individual inaccurate and often scanty records fairly approximate data of the nature required. I do not say that I have made the most suitable selection, nor that in continuing these investigations in future years I shall not recast my tables, omitting some articles and including others. This, however, must not be interpreted as implying that the omission of some of the less desirable, and the inclusion of some of the more desirable, articles will affect the results of my tables to any appreciable extent. In compiling these tables I have had occasion both to omit and to include certain articles, and the result invariably has been that the difference in the index numbers so obtained has been of the most trivial nature. And this degree of divergence must vary inversely as the number of articles. Still, it is desirable, even if only for the semblance of greater reality imparted to the tables, to include only articles of the greatest importance in the trade of the country, provided, of course, the necessary data is forthcoming. The articles I have spoken of above as being less desirable would perhaps be more appropriately described as "unnecessary."

Revision of the Tables: Possible Omissions and Inclusions.

As it is my intention to continue these tables from year to year, I shall revise them, and in the light of experience and fresh information, I may omit certain articles and include others. Agricultural and pastoral products must stand as they are now, with the possible inclusion of potatoes. At first I included potatoes in these tables, but the fluctuations were characterized by such extraordinary vagaries—in some cases a divergence in price of over £20 per ton within a few months—that I reluctantly decided to omit them. Though potatoes are a most important article of diet, yet they are liable to have some other article—*e.g.*, bread—substituted for them in times of great scarcity. In any case, their consumption at such times is greatly curtailed, or a very inferior article is used. In the former case the price should be negatively weighted. An exceptionally high price for potatoes often indicates an exceptionally poor kind of potato; in fact, it indicates a potato famine, the high prices of which attract into the market every tuber that can with any propriety be sold as a potato. This is an additional reason for not including that article, especially if we regard as essential to the inclusion of any article the fact that it should maintain through the years a uniform quality. It may, however, be urged that the psychical efficiency of a "specked" potato in a time of scarcity is just as great as that of a sound one in time of plenty.

Of liquors I have, perhaps, included an unnecessary number. I must urge in justification of their inclusion the remarkable ease with which data is obtainable, especially in the earliest days of the Dominion. And I must also plead with greater force the large amount per head spent on liquor in New Zealand. It is true this *per capita* amount threatens to become a gradually diminishing quantity, especially when it is recollected that one-fifth of the constituencies in New Zealand closed every hotel at the licensing poll in 1908, and that the aggregate no-license vote in that year was greater than the aggregate vote for continuance. The rapid growth of the no-license vote, coupled with the fact that a law providing for Dominion as well as local option has been placed on the statute-book, might well make the inclusion of liquors in these tables an anomaly, if not an impossibility, after 1915. Be this as it may, I think it would be well to omit either port or claret, but the inclusion of brandy is justifiable on this ground, if on no other, that it helps to swell the list of manufactured articles of which most accurate data is obtainable. The consumption of it, however, is small. But beer and whisky should still have a place, if reliable statistics can be obtained—*i.e.*, if the prices quoted represent a uniform quality, or if the articles satisfy a uniform want from year to year.

Some of the other articles—*e.g.*, matches and pepper—are marketed in relatively small quantities; but their inclusion is justifiable on the grounds that most accurate data is obtainable, and that, as manufactured goods, they serve to counteract the exceptional influence often exerted in the index number by a preponderance of raw products.

It may be noted that no article of apparel appears in the tables. To include woollen, cotton, and linen goods would be desirable, especially if one could be sure that the commodities thus included were of uniform quality throughout long periods. But these prices are not officially quoted, and the labour involved in getting them would probably not be compensated by any increased accuracy in the result.

Kauri-gum, however—a very valuable item among our exports—is a commodity which I shall probably include in my lists. I anticipate some difficulty in getting suitable data, more especially as the export is confined entirely to the northern province of New Zealand, and as there is such a number of varieties of the gum. The gum is now very carefully "picked," and graded. Gum of a certain grade has now a definite meaning, and error may creep in by assuming that the "best" gum of twenty years ago was of as good a quality as the "best" gum of 1908. The increased attention paid by the Government to the matter of grading is likely to prove somewhat embarrassing to the investigator that endeavours to compare past with present prices. It is being gradually extended to all our staple exports—notably to meat, butter, cheese, hemp, and kauri-gum; in fact, in some cases it may render comparison impossible. £100 a ton for best gum in 1870 may really represent a higher price for gum than £120 per ton in 1908, owing to the fact that the gum of 1870 may have been of a much inferior and less uniform kind.

Another item which I would like to include, because it bulks so largely in our export trade, is hemp (*Phormium tenax*, or New Zealand flax). Here again the work of the Government graders has raised the price of the product, but it has rendered comparison of present prices with the prices of the pre-grading era a matter of great difficulty.

Some form of timber I shall certainly include.

A Comparison with the Commodities of other Tables.

Since, theoretically at least, the accuracy of the results obtained from a tabular standard depends to some degree upon the choice of commodities, it is worth while comparing the commodities included in such tables as Sauerbeck's and that of the "Economist" with those included in my own. In spite of certain errors of inclusion and exclusion from which my tables may suffer, I think I can reasonably claim that my list, in so far as it includes a much larger percentage of manufactured commodities, is more representative than either of the other two. Sauerbeck's list is certainly open to the theoretical objection that it includes quite an undue proportion of raw materials. Now, if it be true, as pointed out in Chapter IV, that over long periods raw materials do not manifest that fall in value which is the result of improved processes of production, then tables based largely on them fail, to some extent, as a

correct index of the appreciation of gold. Such tables are open to the further objection that an exceptional rise in one commodity —*e.g.*, coal—may cause exceptional rises in a group of commodities —*e.g.*, minerals—in the production of which it is indispensable. It may be urged, however, that inflated prices for some group of commodities, due to exceptional conditions of production and not to any alteration in the supply of the medium of exchange, will effect a corresponding reduction in the price of other groups, and that these fluctuations will tend in a great degree to neutralize each other. But this only emphasizes the necessity for making the list of commodities as diversified as possible.

The list of commodities included in the tables of the "Economist" is open to this objection in an even greater degree.

I pass now to a brief outline of the articles included in my tables.

Commodities included in the Tables.

A. Exports.

1. *Agricultural.*

Wheat.—The best wheat on the Christchurch market.
Oats.—The best oats on the Christchurch market.
Barley.—The best barley on the Christchurch market.
Flour.—The best brands of New Zealand roller flour.
Oatmeal.—First-class New Zealand manufacture.

The prices of the commodities are all Christchurch prices, and are obtained from the special commercial reports of "The Press" (Christchurch) and "The Lyttelton Times" (Christchurch).

2. *Pastoral.*

As wool was not marketed in large quantities in New Zealand prior to 1877, the prices of New Zealand wool at the London wool-sales, minus freight from New Zealand, is taken. The figures were obtained for this work by H. Matson and Co. (one of the principal wool-broking firms in New Zealand) from their London agents.

Wool.—The best quality merino and half-bred.

Beef.—The price per 100 lb. of the best quality of beef offered at the Addington (Christchurch) saleyards. (Prices are from the commercial reports of the *Press* and the *Lyttelton Times*.)

Mutton and Lamb.—The price per hundredweight of mutton is deduced from the "Statistics of New Zealand." The statistics give the weight of the complete carcases exported, and their estimated values. Dividing value by weight, the price per hundredweight is approximated. No better method is, so far, available.

Butter, Cheese, Bacon.—The prices of these are for the best qualities of New Zealand produce only, and are quoted from the "Trade Review and Price Current" (Wellington).

B. Imports.

The prices of the following commodities are quoted from the "Trade Review and Price Current," and are for the best brands only. It is unnecessary to quote more than a few in detail.

1. *Beverages.*

Tea.—Congou, fine.
Coffee.—Ground.
Cocoa.—Van Houten's.

2. *Liquors.*

Beer.—Bass's "Dog's Head," at per dozen quarts.
Whisky.—Teacher's, at per gallon (in bond).
Port.—Superior, at per gallon (in bond).
Claret.—At per dozen (in bond).
Brandy.—Hennessy's, per case (in bond).

3. *Minerals.*

Iron.—Galvanized, "Orb" brand (26 gauge), per ton; bar, per ton.
Wire.—Black fencing, No. 8, per ton.
Zinc.—Per ton.
Lead.—Sheet, per ton.
Coal.—Newcastle (New South Wales), on ship.

4. *Oils.*

Kerosene, Castor-oil, Linseed (boiled).—At per gallon.

5. *General Materials.*

Cement.—Portland, per barrel.
Candles.—Price's London Sperm, per pound.
Hops.—Formerly Kentish; in later decades, Nelson (New Zealand.)
Matches.—At per gross, plaids.
Soda-carbonate, Soda-crystals.—At per hundredweight.

6. *Imported Foodstuffs.*

Sugar.—Auckland (New Zealand), Refined No. 1. Previous to the opening of the Auckland refinery, prices quoted are for best imported sugar.
Salt.—Liverpool, fine.
Salmon.—Per dozen tins.
Rice, Sago, Pepper (white), Currants, and Sultanas.

CHAPTER VII.—ADDITIONAL NOTES ON SOME STAPLE COMMODITIES.

Wool.

Owing to her geographical isolation, and to the paucity or undeveloped state of her mineral resources, it is certain that the prosperity of New Zealand will depend for some considerable time upon her resources of soil and climate. In this chapter, therefore, I shall speak in some detail of the great staple articles of production—wool, meat, and wheat.

Wool has been, and still is, the great staple product of New Zealand. Reliable statistics of prices are, however, very difficult to obtain. This is especially the case before 1880, about the time wool-sales were first held in New Zealand. For information as to the price of wool in New Zealand from 1882 to 1902 I am indebted to the New Zealand Loan and Mercantile Company. For many years they issued a wool chart with their annual review. I am assured by responsible officers in that and kindred companies that great care is exercised in the compilation of such charts, and any errors that creep in would be detected by other firms. From 1877 to 1882 I rely upon the statistics of prices in the "New Zealand Country Journal," published by the Canterbury Agricultural and Pastoral Association. Prior to this time all the clip was shipped to London for sale.

H. Matson and Co., of Christchurch, an old-established firm of wool-brokers, instructed their London agents to make inquiries on my behalf. I have accordingly been supplied with the London prices of "super-greasy" New Zealand wool from 1860 to 1877, and from these prices I have subtracted freight-charges from New Zealand to London. The agents report that the London records are so obscure that they cannot say whether the prices supplied are the prices of merino or half-bred wool. I have found the index number for this wool by taking as the standard price *the average of the average prices* of super-merino and super-halfbred wool during the decade 1890–99. Of course, this standard price can be considered the proper standard for 1861–77 only if the records from which the London prices were obtained included the same number of price quotations for each kind of wool.

The great importance of the wool-producing industry to New Zealand is exemplified by the following table. In the second column is given the total value of New Zealand's exports, and in the

fourth column the ratio in which the value of the wool exported from the Dominion stands to that of the aggregate exports.

Year.	Total Exports. £	Wool. £	Percentage.
1860 ...	549,000	444,000	81
1865 ...	3,503,000	1,115,000	32
1870 ...	4,545,000	1,704,000	37
1875 ...	5,476,000	3,398,000	62
1880 ...	6,102,000	3,398,000	52
1885 ...	6,592,000	3,073,000	47
1890 ...	9,429,000	4,151,000	44
1895 ...	8,390,000	3,662,000	44
1900 ...	13,055,000	4,749,000	36
1905 ...	15,504,000	5,391,000	34
1910 ...	21,544,000	7,194,000	32

In order to emphasize the influence of wool upon the prosperity of New Zealand, I have given wool two index numbers—one for super-greasy merino and the other for super-greasy half-bred. On the whole, the price of wool has been fairly uniform, merino averaging 10d. and half-bred 10d. during the "eighties"; merino 7·9d. and half-bred 9·25d. during the "nineties"; while from 1900 to 1908 merino has average 10·4d. and half-bred 10·5d. To this maintenance of wool-values, together with the rapid increase in the aggregate production of wool, must be ascribed no small measure of that prosperity which the Dominion has enjoyed during the last ten years. The rapid increase in the production of wool must in turn be ascribed in a great measure to the development of the frozen-meat industry, which in 1882 first exported meat to the value of £19,399, an amount which in 1910 had risen to £4,304,295. The appended table shows the annual export of wool, and attention is directed to the ratio of increase since the "eighties." As the local consumption is even now insignificant, being only 1½ per cent. of the total clip, the total export is approximately the total production.

Average Annual Export of Wool (by Weight).

Decade.	Annual Wool Export in Million Pounds.
1860–69	... 18
1870–79	... 50
1880–89	... 80
1890–99	... 127
1900–09	... 152

Frozen Meat.

I have been unable to ascertain as satisfactory price statistics for mutton or lamb as I could wish. Frozen meat was first exported in 1882, and since then the increase in export has been uniform and

continuous. In 1888 we exported the article to the value of £628,000; in 1898, £1,698,750; and in 1910, no less than £4,304,295—in other words, this one commodity contributed last year 20 per cent. of our total exports. The development of the industry has synchronized with a continuous increase in the prosperity of the country, and has enabled it to turn its great pastoral resources to the best account. By adding to the number of commodities one for the production of which the country is eminently suitable, it has enabled the inhabitants to enjoy in great measure the advantages accruing from a depreciation of the standard of value. It has caused a great increase in the export of wool, tallow, and hides; it has advanced the science and improved the art of agriculture (Chapter II, Part II), and it has increased our commercial and financial stability by augmenting and diversifying the list of our staple articles of export. It has greatly increased the aggregate volume of the products of the soil, without proportionately adding to the labour of production, and thus would have promoted the prosperity of the country even if the general level of prices had not risen.

But though the prosperity of New Zealand, and of Canterbury in particular, is so intimately associated with the prosperity of this particular industry, yet, strange to say, this is the one subject about which the average person seems to know so much and in reality knows so little. The farmer and the meat-exporter can tell you meat is "up" or "down"; that it was cheap one year and dear another; but neither appears able to say what meat was actually worth at any particular time. This seeming paradox arises from the peculiar and yet natural way in which the commodity is bought or sold. The farmer puts his sheep, when fat, into the saleyards, and there they are sold at so much per head. This price is determined partly by the current price ruling for mutton in the London market and partly by the current price of tallow, hides, leather, and wool.

The matter is further complicated by the fact that the amount of wool on the sheep depends upon the season at which they are sold. Sheep will, other things being equal, advance in price from January, shortly after shearing, till November, shortly before shearing. Thus the price per head of sheep gives no indication of the price per pound of mutton which the farmer is actually receiving. To determine that from the mere price per head one would have to take into consideration the dressed weight of a sheep—a very variable quantity—the probable amount and value of the tallow, the value of the skin, and the probable amount and value of the wool. This is a task which I have found impossible to undertake.

Some of the meat-freezing companies buy sheep at per pound dressed weight. Thus, if the company gives the farmer 4½d. per pound for his mutton, 3d. per pound might represent the actual value of the mutton. The extra 1½d. is due to the value of

the by-products distributed over the dressed weight of the carcase, less, of course, the cost of slaughtering, depreciation, and normal profits. Thinking to surmount the difficulty, I obtained the chart of Weddel and Company, of London, wherein they record the fluctuations in the price of mutton from year to year. This chart shows the actual price which New Zealand mutton realizes in England. But when I approached the meat-exporters and meat-freezing companies, and asked them to translate the Smithfield prices into their Christchurch equivalents, they confessed that the task was an extremely difficult one. They told me that the price offered to farmers in Canterbury is based upon the price then current in Smithfield, a judgment tempered by the prospect of probable variations of Smithfield prices during the eight weeks' interval which must necessarily elapse before the sheep depasturing on the Canterbury Plains are lying in the London cold-storage warehouses.

What the meat-exporter receives is, therefore, not necessarily what the farmer receives. It is generally a trifle more. But to reduce the London price to its Christchurch equivalent demands something more: insurance and freight charges—no inconsiderable items, especially in the "early days" of the meat-export trade—must be deducted. Insurance-charges, indeed, used to amount to no less than 3d. per pound. Improved mechanical appliances for insuring a uniformly low temperature throughout the voyage have operated in steadily reducing these charges. Freights, too, have been lowered, owing to the increasing competition of shipping companies; while the growth in the export trade of the Dominion generally has rendered profitable the employment of larger vessels. This increased capacity, combined with the fact that our increasing foreign trade allows these vessels to arrive and depart with fairly complete cargoes, has effected a continuous reduction of freights. Now, while it is true that Smithfield prices are the prices which the Christchurch meat-exporters receive, yet they are not the net prices, and are therefore useless for purposes of comparison unless due allowance is made for freight and insurance charges. For instance, Weddel and Company's chart shows that in 1889 New Zealand mutton realized in Smithfield 8d. per pound, while in 1908 it realized only 6d. per pound. But if in 1889 freight and insurance amounted to 5d. per pound, and in 1908 to 3d. per pound, then the prices, instead of being in the ratio of 9 : 6, are actually in the ratio of 3 : 3; and it is the last ratio which I submit is the only one of importance in this inquiry.

In the absence of more accurate data I have taken the figures of the mutton and lamb export trade from the Government publication, "Statistics of New Zealand." I have taken the aggregate weight and value of the complete carcases of mutton and lamb shipped. Dividing the value by the weight, I have obtained a price which I have incorporated in my tables. As to its reliability, I can only say of the data that the weight is most probably correct, and that

the statistics of exports are generally submitted to the Chambers of Commerce in New Zealand for their approval before publication.

The important question which remains concerns the uniformity of quality of the shipments. Is the quality more uniform than it has been? It is true that more attention has been given to grading; but the real question is, Has the percentage of prime mutton to the total export increased? If it has increased to a material extent, then the index number obtained for mutton and lamb by this method will slightly exaggerate any rise or minimize any fall due to other conditions. For if in consecutive years the average quality of the export improves, we are dealing with an article whose quality is superior to that which it formerly possessed. I have endeavoured to avoid any possible error in this respect by taking the weight and value of complete carcases only; and as the export trade in frozen meat has not been long in existence, it is most probable that any alteration in price due to alteration in quality has been but slight. If, however, I can in the future get statistics of prices in the manner I indicated above, then the two methods can be compared.

The inclusion of mutton and lamb in the tabular standard has had very little effect upon the annual index number. In three cases it raised it by one, and in one case by two. In another case it lowered the number by one point; while in twenty-two cases the number was not affected to any appreciable extent. This may indicate either that, given a fairly large number of commodities, no additional advantage is to be gained by extending the list, or that the method I have adopted for obtaining the price of mutton is substantially correct, inasmuch as it is very probable that the variations in the price of mutton would be, on the whole, parallel to those in the general mass of commodities.

Wheat.

Wheat stands in a somewhat different category from wool. Of the latter, almost the whole production is exported, and, even with the increase of local manufacture stimulated by the growth of that local patriotism which seeks to realize itself in giving preference to the manufactures of its native land, the amount of wool retained in the Dominion is almost negligible compared with the amount exported. Even now the local consumption does not represent more than 1½ per cent. of the local production.

With wheat it is otherwise. From the very beginning of settlement in New Zealand flour-mills have been at work. Improvements in the processes of milling have rendered our millers capable of furnishing a flour as good as the quality of our wheat will admit. An import duty on flour and wheat has also successfully prevented the importation of these to any great extent; and since 1873, when the tide in cereals first flowed in favour of New Zealand, there has been an almost negligible importation of wheat.

Till the rise of the frozen-meat industry, wheat and wool were the two most profitable products of the soil. But meat was almost despised, often realizing only 1d. per pound wholesale. Since the discovery and application of the freezing process, the position has been reversed. Mutton, wool, butter, and cheese have competed with wheat for the use of the land. Now that there is an available market for any quantity of mutton and butter at prices exceeding those ruling before the days of the refrigerating process, the farmers have found the keeping of sheep and cattle a most profitable industry, even on lands once devoted to wheat-growing. The result has been what would naturally be expected from a people keenly alive to their own interests, and with no traditional methods of farming to fetter their judgment. Lower-grade wheat lands have been abandoned to pastoral purposes, and the last twenty years has seen a persistent decline in the production of wheat coincident with a proportionate increase in that of pastoral products. Wheat, once a predominant commodity in our list of exports, is now grown in quantities little more than sufficient for our own requirements. Of late years we have hovered on the verge of a wheat panic, due to local scarcity.

A few figures will make the position clearer. From 1880 to 1890 the annual average amount of wheat produced in New Zealand was 8,000,000 bushels. In the "nineties" the annual average fell to 7,300,000 bushels; and during the first seven years of the century the average has been only 6,700,000 bushels. Our exports of wheat during the same periods were an annual average of 2,500,000 bushels during the "eighties," and 1,500,000 bushels during the "nineties"; while the export between 1900 and 1908 has averaged only about 1,000,000 bushels per year, being in 1907 little more than 2,000 bushels. As indicating that it is the lower-grade lands that have been abandoned to pastoral purposes, it is almost sufficient to note that during this century the wheat-yield has been the highest on record—namely, 31·6 bushels per acre—against an average of 23·8 for the preceding century. Part of this rise must indeed be credited to improved methods of farming, due to a more suitable rotation of crops, made possible by the great development of the pastoral industry. Thus, the frozen-mutton industry caused a large acreage to be sown in turnips, while the remarkable development of the frozen-lamb trade has caused a similar large acreage to be devoted to the growing of rape. Both of these crops, besides being excellent and favourite fattening-foods for sheep and lambs, leave the soil in prime condition for the growing of wheat. If to this we add the increased use during recent years of artificial manures, now largely produced as by-products of the meat-freezing industry, we explain to some extent (though I do not believe wholly) the rise in the yield per acre.

Synchronous with the decline in production, there has been a steady and persistent decline in prices since the "sixties" to the

end of the century. The present century has witnessed a slight appreciation in values. From my tables it will be seen that from 1860 to 1870 wheat averaged 6s. per bushel, the highest annual average being 8s. 8d. in 1864 and the lowest 5s. 5d. in 1867. During the next decade wheat averaged 4s. 6d. per bushel, the highest annual average being 6s. per bushel in 1877, and the lowest 3s. 9½d. in 1870. During the "eighties" the annual average price suffered a further decline to 3s. 9d., during which time the price rose as high as 4s. 3½d. in 1882 and fell as low as 2s. 11¾d. in 1885. During the "nineties" the decline continued, the cereal averaging only 3s. 4½d. per bushel. From 1900 to 1910 the decline ceased, the average price being again 3s. 5½d. per bushel. Thus we have declining price going hand-in-hand with declining production—at least, since the "eighties." We may regard this declining production as the joint result of the decline in price and the increasing competition of the pastoral industry for the use of the land.

THE TABLES.

[NOTE.—The index numbers are given correct to the nearest whole number. The author will be pleased to acknowledge the correction of any errors which appear either in these tables or in the text.]

CONTENTS.

TABLE 1A.—AGRICULTURAL PRODUCTS.

[NOTE.—In this, as in all the other tables from 1A to 1H, the standard price of the article is its average annual price over the decade 1890–99. This standard price is always inserted *over the top* of the column to which it belongs. The prices in plain Roman type are the average annual prices of the commodities for the particular year, while the numbers in bold type are index numbers expressing the ratio in which the price of any commodity in a particular year stood to the standard price.]

Year.	3/5 = 100. Wheat, per Bushel.		£9 2/10 = 100. Flour, per Ton.		3/7 = 100. Barley, per Bushel.		1/11 = 100. Oats, per Bushel.		£10 7/10 = 100. Oatmeal, per Ton.		Total Index Numbers.
1861	6/-	176	19	199	6/9	188	4/4	226	27	266	1055
1862	4/9	139	14¼	149	5/9	161	5/1	265	27½	271	985
1863	5/7	163	16⅜	171	5/7	156	5/7½	294	29	286	1070
1864	8/8	254	26¼	275	5/1⅛	143	3/11	204	25	247	1123
1865	7/3	212	23½	246	4/10	135	3/11¼	206	23½	232	1031
1866	5/1½	150	17¼	181	5/9	161	4/4⅜	228	29½	291	1011
1867	3/5½	101	12⅜	129	3/11¼	110	2/8¼	140	31	306	786
1868	6/1	178	18½	194	4/0⅜	113	2/3	118	27¾	274	877
1869	4/3	124	10⅜	112	3/8¾	104	2/11¼	153	20½	202	695
1870	3/9½	111	10¼	107	3/5¼	96	2/6⅜	132	17½	175	621
1871	4/8½	137	3	137	2/10	79	2/4½	124	15⅝	154	631
1872	4/4½	129	12¾	133	4/11¼	138	2/1½	111	13½	133	644
1873	4/9¼	140	12	125	6/4	177	3/6	183	21⅛	208	833
1874	4/7½	135	11⅝	121	5/3¾	148	4/5⅜	234	25	246	884
1875	4/2	122	10⅜	109	3/5¼	96	2/10	148	16	157	632
1876	4/3¾	126	11	115	3/3¾	93	1/6¼	79	12	118	531
1877	6/-	176	16	168	4/9	133	2/8¼	140	17½	175	792
1878	4/7⅜	136	12 13/32	130	5/0⅜	141	3/10⅜	203	21	207	817
1879	3/11⅜	116	10⅝	112	5/8¼	159	2/11½	154	21	207	748
1880	4/2	122	11¼	118	3/4½	94	1/8	87	13⅛	133	554
1881	4/1¼	120	10⅞	114	3/5¼	96	1/10⅛	96	11¼	111	537
1882	4/3½	126	10¾	112	4/4	121	2/4	122	15⅛	149	630
1883	4/3	124	10⅜	112	4/3⅜	121	2/2	113	14	138	608
1884	3/7¼	106	9¾	102	3/11¼	110	2/3¼	119	12⅛	119	556
1885	2/11⅜	87	8½	89	3/2½	90	1/10	95	12⅜	122	483
1886	3/9¼	110	10	105	2/11¼	82	2/2¼	114	12½	123	534
1887	3/8¾	109	9¾	102	3/8	103	1/8¼	88	10	99	501
1888	3/-	88	9	94	4/4	121	1/10¾	99	9⅝	95	497
1889	3/10½	113	10½	110	3/10¼	108	2/10½	150	14⅝	144	625
1890	3/1⅜	92	9 7/16	98	3/2½	89	1/8	87	9¾	96	462
1891	3/10½	113	11¼	118	3/1¼	87	1/9¼	92	9	89	499
1892	4/-	117	11⅛	116	3/5½	97	1/10½	98	10	99	527
1893	2/9¼	81	8¼	86	3/7⅛	101	1/9¼	92	10½	104	464
1894	2/5¾	73	7¼	76	3/9¼	105	1/8¾	90	9½	94	438
1895	2/11¼	86	8	84	3/2	89	1/7	83	8⅝	85	427
1896	3/7¼	106	10	105	3/6⅜	99	2/0¾	108	10½	104	522
1897	4/3¼	125	11⅝	121	4/10½	113	2/3	118	12⅛	119	596
1898	4/2¾	124	11¾	123	4/7½	118	2/6¾	134	12⅛	119	618
1899	2/6¾	75	7	73	2/6½	71	1/9½	93	9¾	96	408
1900	2/4¾	70	7½	79	3/0½	85	1/7¾	84	10¼	101	419
1901	2/5⅛	71	6 11/16	70	2/5½	69	1/9¾	94	10½	104	408
1902	3/6	103	9⅞	103	3/4¾	95	2/5¾	129	14	138	568
1903	4/2	122	10⅞	114	3/4	95	2/0½	105	11½	113	547
1904	3/1½	92	8⅞	93	2/11	82	1/6½	80	9¼	91	438
1905	3/1½	92	9⅛	96	4/-	112	1/9	91	10¾	106	497
1906	3/2½	94	8⅝	90	4/0¾	113	1/11½	102	12¾	126	525
1907	3/9	110	9⅜	98	3/11¼	110	2/7¼	136	15½	153	607
1908	4/7½	135	11	115	5/5	151	2/5½	128	14	138	667
1909	4/1	120	10⅔	112	3/9	105	1/6¼	79	10⅝	106	522
1910	3/8	107	9⅜	100	4/9	133	1/10⅓	97	11⅔	115	552

TABLE 1B.—PASTORAL PRODUCTS.

Year.	7 9/16d. = 100. Merino Greasy, per Pound.		9¼d. = 100. Half-bred Greasy, per Pound.		20/5½ = 100. Beef, per Hundredweight.		£1 1s. = 100. Mutton, per Hundredweight.		£1·45 = 100. Lamb, per Hundredweight.		6½d. = 100. Bacon, per Pound.		7d. = 100. Butter, per Pound.		4¾d. = 100. Cheese, per Pound.		Total Index Numbers.
1861	Super-wool.		13	149	..		..		..		9⅝	158	12	172	10⅛	214	693
1862			12¾	146	..		..		..		10½	172	12	172	9½	200	690
1863			12¾	146	51/-	249	..		..		11	180	21	300	12¼	258	1133
1864			13¼	151	53/-	259	..		..		11	180	14	200	12	253	1043
1865			13⅛	150	47/4	231	..		..		11	180	12	172	12	253	986
1866			13¼	151	55/3	270	..		..		11¾	193	23½	333	13½	285	1232
1867			11½	129	54/8	267	..		..		13	213	14½	207	12	253	1069
1868			10¼	117	38/9	189	..		..		13	213	15	214	15	316	1049
1869			8¾	100	34/4½	168	..		..		8	131	11⅛	159	11	232	790
1870			9¼	106	28/9	141	..		..		8	131	8½	121	9⅛	193	692
1871			12	137	21/4½	105	..		..		9	148	7¼	104	4¼	90	584
1872			15	171	21/4½	105	..		..		7	115	7	100	6 1/16	128	619
1873			14½	166	19/1½	94	..		..		8	131	9¼	133	9½	200	724
1874			14½	166	25/7⅛	126	..		..		8½	140	10⅜	148	8⅜	177	757
1875			13	149	30/7½	148	..		..		11½	188	11⅜	163	9⅛	198	846
1876			11¾	134	31/3	153	..		..		11	180	13½	193	10	211	871
1877	9⅞	125	10¼	111	30/7½	150	..		..		10	164	10½	150	8⅜	177	877
1878	10	127	10⅛	109	30/10½	151	..		..		7½	123	8⅛	116	7⅛	150	776
1879	9 5/16	118	8¾	95	29/7½	145	..		..		8½	140	10	143	7¾	164	805
1880	10½	134	9⅞	107	21/9	107	..		..		9	148	6⅛	93	11⅛	243	832
1881	11⅛	141	10¾	116	20/7½	101	..		..		8	131	7	100	10	211	800
1882	11½	146	10 1/16	109	21/7½	106	1·27	116	..		7¾	127	9⅜	134	8¼	174	912
1883	10¾	136	9 7/16	101	22/10½	112	1·33	122	..		7⅝	125	8	115	6¼	132	843
1884	10¼	130	9½	103	20/1½	99	1·36	124	..		8 1/16	132	7¼	104	4⅝	98	790
1885	9½	120	9½	103	20/1½	99	1·25	114	..		8¼	135	8¾	125	5	106	802
1886	8½	108	9½	103	20/3	99	1·23	112	..		6⅝	108	8¼	118	5¼	111	759
1887	8⅝	108	9¾	105	19/6	96	1·07	96	1·68	116	6	98	5½	79	4¾	100	798

52

1888	9	114	9¾	105	17/7½	86	0·60	56	1·31	90	6⅜	105	7½	107	3⅞	82	745
1889	10¾	136	12¼	132	18/-	88	1·17	106	1·46	101	7¾	127	7¼	104	5 6/16	112	906
1890	9½	120	11¼	122	20/9	102	1·19	108	1·51	104	7	115	6⅛	88	3¾	79	838
1891	8½	108	11¾	127	19/6	96	1·18	107	1·46	101	6	98	6⅜	91	4¼	90	818
1892	7 1/16	90	9¼	100	19/-	93	1·16	106	1·48	102	5⅝	92	9½	136	4½	95	814
1893	7½	95	9⅛	99	23/3	114	1·14	104	1·49	103	7 1/16	119	7	100	4⅞	103	837
1894	6¾	86	8⅝	93	23/7½	117	1·11	101	1·46	101	7 13/16	128	8	115	4 5/16	96	837
1895	6¾	86	8	87	21/3	104	1·03	94	1·41	97	6	98	7	100	4⅛	87	753
1896	7¼	95	8¼	89	20/6	100	1·05	96	1·40	97	5⅝	92	6⅞	98	3⅞	82	749
1897	7 1/16	90	8	87	17/10½	87	1·02	93	1·42	98	4⅝	76	6	86	4	85	702
1898	7½	95	7¾	84	19/7½	96	1·00	91	1·41	97	4½	74	6¼	89	4½	95	721
1899	10⅜	136	10½	114	19/3	94	1·03	94	1·42	98	6⅝	108	6⅛	88	9	190	922
1900	10¼	130	9½	103	21/4½	105	1·05	96	1·41	97	5½	90	6⅝	95	9	190	906
1901	7¾	92	7¼	78	24/7½	121	1·09	98	1·52	105	6 1/16	99	7⅜	111	9	190	894
1902	8	101	7¾	84	26/9	131	1·15	105	1·55	107	6 13/16	112	8 3/16	117	9	190	947
1903	10 7/16	134	9 5/16	101	30/3	148	1·24	113	1·46	101	8⅜	137	7⅝	109	8½	179	1022
1904	11	139	10 7/16	112	25/1½	123	1·35	123	1·82	126	6¾	111	7⅛	102	8	169	1055
1905	11 1/16	140	12⅛	131	23/1½	113	1·44	131	1·97	136	6¾	111	8⅛	116	8	169	1047
1906	12 1/16	153	13 1/16	150	24/1½	118	1·17	106	1·72	119	7⅛	117	8½	121	8¼	174	1058
1907	12 1/16	153	13 7/16	145	25/1½	123	1·33	121	1·78	123	8⅜	117	7¾	111	6⅝	140	1033
1908	11 7/16	145	11¾	127	25/6½	125	1·36	124	1·86	128	8¾	143	9⅝	138	6 13/16	143	1073
1909	11⅝	147	13	141	22/7	110	1·2	109	1·75	121	8¼	135	11⅛	159	6¼	132	1054
1910	13	163	14	151	26/3	129	1·19	108	1·75	121	7 5/12	123	11 1/12	157	6	126	1078

53

TABLE 1C.—LIQUORS.

Year.	11/9½ = 100. Beer (Ale), per Dozen.		9/- = 100. Whisky, per Gallon.		9/5 = 100. Port, per Gallon.		40/- = 100. Claret, per Dozen.		35/11½ = 100. Brandy, per Case.		Total Index Numbers.
1861	12/-	102	..		13/-	138	37/9	94	36/6	102	436
1862	11/6	98	..		13/-	138	39/6	99	36/8	102	437
1863	12/1½	103	..		12/-	128	55/-	138	36/6	102	471
1864	12/1½	103	..		12/-	128	55/-	138	33/9	94	463
1865	12/9	109	..		14/3	151	60/-	150	32/-	89	499
1866	12/9	109	..		14/6	154	60/-	150	29/-	81	494
1867	10/4½	89	..		12/-	128	40/-	100	28 -	78	395
1868	10/9	92	..		11/6	123	33/-	83	31/3	87	385
1869	11/-	94	..		11/-	117	34/6	86	31/6	88	385
1870	11/4½	97	..		11/-	117	80/-	200	28/6	79	493
1871	11/6	98	..		11/6	[123]	60/-	150	30/6	85	456
1872	11/6¾	99	..		12/-	[128]	65/-	165	27/6	77	469
1873	12/4½	106	..		12/6	[133]	50/-	125	30/-	83	447
1874	12/2¼	104	..		12/6	[133]	50/-	125	31/9	88	450
1875	11/6	98	..		12/9	135	45/-	113	31/9	88	434
1876	12/1½	103	..		12/9	135	45/-	113	31/6	88	439
1877	12/3	105	..		12/9	135	45/-	113	32/6	91	444
1878	11/6¾	99	..		10/-	106	45/-	113	33/6	93	411
1879	11/11¼	102	..		10/-	106	45/-	113	34/-	95	416
1880	12/1½	103	10/-	111	10/-	106	45/-	113	38/9	108	541
1881	12/1½	103	10/-	111	10/-	106	45/-	113	36/6	101	534
1882	11/9	100	9/2¼	102	10/-	106	44/6	111	39/6	110	529
1883	11/9	100	9/-	100	10/-	106	45/-	113	32/9	91	510
1884	11/9	100	9/-	100	10/-	106	45/-	113	36/6	101	520
1885	11/9	100	9/-	100	10/-	106	45/-	113	36/1½	101	520
1886	11/7½	99	9/-	100	10/-	106	45/-	113	36/-	100	518
1887	11/6	98	9/-	100	10/-	106	45/-	113	35/7½	99	516
1888	11/3	96	9/-	100	9/10½	105	43/9	110	35/6¾	99	510
1889	11/3	96	9/-	100	9/6	101	40/-	100	36/-	100	497
1890	11/3	96	9/-	100	9/6	101	40/-	100	36/6	101	498
1891	11/3	96	9/-	100	9/6	101	40/-	100	36/6	101	498
1892	11/3	96	9/-	100	9/6	101	40/-	100	36/6	101	498
1893	11/3	96	9/-	100	9/6	101	40/-	100	36/6	101	498
1894	11/3	96	9/-	100	9/6	101	40/-	100	36/-	100	497
1885	11/5¼	98	9/-	100	9/6	101	40/-	100	35/6	99	498
1896	12/8¼	108	9/-	100	9/6	101	40/-	100	35/6	99	508
1897	12/6	107	9/-	100	9/6	101	40/-	100	35/6	99	507
1898	12/6	107	9/-	100	9/6	101	40/-	100	35/6	99	507
1899	12/3¾	105	9/-	100	9/6	101	40/-	100	35/6	99	505
1900	12/3¾	105	9/-	100	9/6	101	40/-	100	31/6	88	494
1901	12/3¾	105	9/-	100	9/6	101	40/-	100	31/6	88	494
1902	12/6	107	9/-	100	9/6	101	40/-	100	31/6	88	496
1903	12/6	107	9/-	100	9/6	101	40/-	100	31/6	88	496
1904	12/7½	108	9/1½	101	9/6	101	40/-	100	31/6	88	498
1905	12/6	107	9/-	100	9/6	101	40/-	100	31/6	88	496
1906	12/7½	108	9/-	100	9/6	101	40/-	100	31/6	88	497
1907	12/9	109	9/-	100	9/6	101	40/-	100	31/6	88	498
1908	12/8	108	9/-	100	9/6	101	40/-	100	35/6	99	508
1909	13/-	111	9/3	103	10/-	106	40/-	100	36/-	100	520
1910	13/-	111	9/3	103	10/-	106	40/-	100	36/-	100	520

TABLE 1D.—BEVERAGES.

Year.	1/5 = 100. Tea, per Pound.		1/1 = 100. Coffee, per Pound.		3/5¾ = 100. Cocoa, per Pound.		Total Index Numbers.
1861 ..	2/10	200	1/3	115	..		315
1862 ..	2/8	188	1/3¾	121	..		309
1863 ..	2/6	176	1/4¾	129	..		305
1864 ..	2/10	200	1/4	123	..		323
1865 ..	2/8	188	1/4	123	..		311
1866 ..	2/7	182	1/4½	127	..		309
1867 ..	3/-	218	1/3½	119	..		337
1868 ..	2/10	200	11d.	85	..		285
1869 ..	2/9¼	196	10⅝d.	82	..		278
1870 ..	2/10	200	1/0½	95	..		295
1871 ..	2/10	200	1/1	100	..		300
1872 ..	2/-	141	10½d.	81	..		232
1873 ..	2/-	141	1/0½	95	..		236
1874 ..	2/3	159	1/3¼	117	..		276
1875 ..	1/10	129	1/4½	127	4/-	116	372
1876 ..	1/10	129	1/5	131	4/-	116	376
1877 ..	1/10	129	1/5	131	4/-	116	376
1878 ..	1/10	129	1/5	131	4/-	116	376
1879 ..	1/10	129	1/5	131	4/-	116	376
1880 ..	1/10	129	1/5	131	4/4¼	126	386
1881 ..	1/10	129	1/5	131	4/6¼	132	392
1882 ..	1/10	129	1/5	131	4/2½	123	383
1883 ..	1/10	129	1/2¾	113	4/1	119	361
1884 ..	1/10	129	1/2	113	4/2	121	363
1885 ..	1/10	129	1/2	108	3/9¾	111	348
1886 ..	1/10	129	1/1½	104	3/9	109	342
1887 ..	1/2½	85	1/1½	104	3/9	109	298
1888 ..	1/2¾	87	1/1⅜	104	3/8	107	298
1889 ..	1/5	100	1/1	100	3/4¼	98	298
1890 ..	1/5	100	1/1	100	3/3	95	295
1891 ..	1/5	100	1/1	100	3/5½	99	299
1892 ..	1/5	100	1/1	100	3/8	107	307
1893 ..	1/5	100	1/1	100	3/8	107	307
1894 ..	1/5	100	1/1	100	3/8	107	307
1895 ..	1/5	100	1/1	100	3/8	107	307
1896 ..	1/5	100	1/1	100	3/3	95	295
1897 ..	1/5	100	1/1	100	3/3	95	295
1898 ..	1/5	100	1/1	100	3/3	95	295
1899 ..	1/5	100	1/1	100	3/3	95	295
1900 ..	1/5	100	1/1	100	3/3	95	295
1901 ..	1/5	100	1/1	100	3/3	95	295
1902 ..	1/5	100	1/1	100	3/3	95	295
1903 ..	1/5	100	1/1	100	3/2¾	94	294
1904 ..	1/5	100	1/1	100	3/2½	94	294
1905 ..	1/5	100	1/1	100	3/2½	94	294
1906 ..	1/5	100	1/1	100	3/2½	94	294
1907 ..	1/5	100	1/1	100	3/2½	94	294
1908 ..	1/5	100	11¼d.	87	3/3	95	282
1909 ..	1/7	112	1/3	115	3/3½	95	322
1910 ..	1/7	112	1/3	115	3/3½	95	322

Table 1E.—Oils.

Year.	1/5 = 100. Kerosene, per Gallon.		3/1¼ = 100. Linseed Oil, per Gallon.		3/0¾ = 100. Castor Oil, per Gallon.		Total Index Numbers.
1861 ..	4/-	282	5/5	174	..		456
1862 ..	5/-	353	5/8	184	..		537
1863 ..	5/3	371	5/7½	181	..		552
1864 ..	5/3	371	5/9	[185]	8/-	[260]	816
1865 ..	5/10½	415	5/9¾	187	7/6	243	845
1866 ..	5/6	388	5/10½	189	8/-	260	837
1867 ..	4/7½	325	6/3	201	8/6	276	802
1868 ..	3/4	234	6/0¾	195	8/-	260	689
1869 ..	2/11¾	210	5/8¼	184	8/-	260	654
1870 ..	3/6	247	5/0⅓	162	7/9	252	661
1871 ..	3/0⅛	214	5/-	161	6/-	195	570
1872 ..	2/9⅛	195	5/6	177	6/-	195	567
1873 ..	2/9½	197	5/5½	175	6/-	195	567
1874 ..	2/3	159	5/0½	163	6/-	195	517
1875 ..	2/-	141	4/6	145	5/6	180	466
1876 ..	2/3	159	4/2	134	4/6¾	149	442
1877 ..	2/8½	191	4/3	137	4/7½	150	478
1878 ..	2/-	141	4/5½	144	5/1½	166	451
1879 ..	1/9⅛	124	4/2¼	135	5/3	172	431
1880 ..	2/-	141	4/3½	138	4/6	147	426
1881 ..	2/0⅝	145	4/-	129	4/1½	135	409
1882 ..	1/7¾	117	3/10	124	3/8¾	122	363
1883 ..	1/10½	133	3/9	121	3/7	117	371
1884 ..	1/9¼	125	3/5¼	111	4/1	134	370
1885 ..	1/9	124	3/5	110	3/6½	117	351
1886 ..	1/7	112	3/3	105	3/4½	110	327
1887 ..	1/7⅛	112	3/2¼	103	3/1½	102	317
1888 ..	1/8¼	119	3/2¾	105	2/11	95	319
1889 ..	1/8¼	119	3/2	102	3/4⅗	111	332
1890 ..	1/7¾	117	3/4¾	110	3/7¼	118	345
1891 ..	1/5½	103	3/6⅛	112	3/6	114	329
1892 ..	1/2½	85	3/4	108	3/0½	99	292
1893 ..	1/2¼	84	3/0⅛	97	2/8½	89	270
1894 ..	1/3⅝	92	3/1¼	100	2/7¾	86	278
1895 ..	1/3¾	93	3/1	99	2/5½	80	272
1896 ..	1/3¾	93	3/1½	101	2/8½	89	283
1897 ..	1/4½	98	2/11⅞	97	3/5¾	114	309
1898 ..	1/2¾	87	2/10⅞	89	3/4	109	285
1899 ..	1/8	118	2/6¼	68	3/1¼	102	288
1900 ..	1/2	83	3/7¾	119	3/5½	113	315
1901 ..	9⅞d.	59	4/4½	141	3/8½	121	321
1902 ..	9⅜d.	56	4/4½	141	3/5½	113	310
1903 ..	10⅛d.	60	3/11½	128	3/1½	102	290
1904 ..	10d.	59	3/2	102	2/11½	97	258
1905 ..	9⅝d.	57	3/1¼	100	3/-	98	255
1906 ..	10 5/32d.	61	3/2¼	103	3/6	115	279
1907 ..	10½d.	62	3/5½	112	3/10½	126	300
1908 ..	11d.	65	3/1½	101	3/2¾	105	271
1909 ..	11¼d.	66	3/3	105	2/11¾	97	268
1910 ..	11¼d.	66	4/3	137	3/5⅝	114	317

Table 1F.—Minerals.

Year.	£18⅛ = 100. Iron, galvanized, per Ton.		£9 19/20 = 100. Iron, bar, per Ton.		£18⅜ = 100. Lead, sheet, per Ton.		£28 5/16 = 100. Zinc, per Ton.		£9⅞ = 100. Wire, No. 8, per Ton.		27/3 = 100. Coal, per Ton.		Total Index Numbers.
1861	42	226	14¼	148	..		46	159	20	203	51/-	187	923
1862	40¼	215	18¼	189	..		46	159	18½	188	60/-	220	971
1863	39½	212	17	177	42¼	230	46	159	18	183	47/6	174	1135
1864	40	215	17	177	42	228	46	159	18	183	39/-	143	1105
1865	36½	196	17	177	36	195	37	128	21	213	42/-	154	1063
1866	37	199	17	177	33	179	..		22	223	44/-	162	898
1867	37¼	200	17	177	..		..		22	[223]	32/6	120	720
1868	35½	191	16¼	169	..		..		21	[213]	35/6	129	702
1869	32¾	176	13¼	138	..		..		20⅛	[204]	32/-	118	636
1870	30	161	12	125	..		..		19⅞	200	26/4	97	583
1871	31	164	13	[135]	..		..		21	213	35/-	[128]	640
1872	32⅓	174	15	[154]	..		..		22½	229	45/-	165	722
1873	42⅓	227	21	[217]	..		..		30½	308	36/-	132	884
1874	36½	196	18⅞	[195]	30½	166	..		27¾	282	37/6	137	976
1875	35¼	187	18⅝	193	29⅓	160	38⅔	133	22⅔	229	38/-	138	1040
1876	32⅝	172	18	187	29	158	38½	134	18⅜	186	35/-	128	965
1877	32¼	173	18	187	28½	155	37½	130	17⅛	174	33/6	123	942
1878	27⅜	147	13⅔	143	26¾	146	35⅝	124	15⅝	159	32/-	118	837
1879	25¼	135	12⅛	126	15¼	83	31⅝	110	13½	137	32/-	118	709
1880	27⅜	149	13½	140	22	120	30	104	15	152	32/9	121	786
1881	24⅝	132	12⅝	131	21⅛	115	29½	101	14¾	150	30/9	113	742
1882	24½	129	11½	119	20¾	113	27⅛	94	14¼	145	27/-	99	699
1883	22⅝	122	11¼	117	18⅔	102	25⅛	87	13¼	135	27/-	99	662
1884	22¼	120	10½	109	17¼	94	24½	85	12⅝	128	27/-	99	635
1885	21⅛	114	10½	109	16⅜	88	23⅛	80	11⅝	118	26/6	98	607
1886	18⅞	101	9¾	101	16¾	91	22¼	77	10⅞	111	25/-	92	573
1887	17¾	95	9⅛	98	18 1/16	98	22⅜	77	10⅜	106	25/-	92	566
1888	19	102	9¼	96	20	109	25⅞	90	10 3/16	104	25/-	92	593
1889	20⅞	112	8⅛	88	21½	117	28⅛	98	11	112	30/-	110	637
1890	22⅔	121	10⅛	109	21⅜	117	31¾	110	13 1/16	132	30/-	110	699
1891	21⅝	116	10½	109	21⅝	118	31½	109	12 1/16	123	30/-	110	685
1892	20	108	10½	109	20	109	31¼	108	11⅛	113	30/-	110	657
1893	18 3/16	98	10½	109	16⅝	91	28¾	100	9 7/16	96	30/-	110	604
1894	17¾	95	9	94	16 9/16	90	27⅔	96	9 6/16	94	30/-	110	579
1895	16⅜	88	8½	88	15⅞	87	27⅝	96	8⅞	90	30/-	110	559
1896	18¼	98	8½	88	16½	90	24⅛	84	8¼	84	30/-	110	554
1897	17⅝	95	9	94	17 7/16	95	26¼	91	8 9/16	87	22/6	83	545
1898	17 1/16	92	9	94	19	104	26½	92	8 13/16	90	20/-	74	546
1899	19⅝	107	10⅜	108	19¾	108	33⅔	116	9⅛	93	20/-	74	606
1900	22½	119	13⅛	136	22½	123	37¾	131	10½	109	20/-	74	692
1901	20 3/16	108	12⅜	128	21½	116	33½	116	10 16/16	102	20/-	74	644
1902	19¼	104	11⅛	115	17¾	97	29¼	101	9 9/16	97	20/-	74	588
1903	19¼	104	10 3/16	106	18	98	30	104	8 13/32	91	20/-	74	577
1904	18¼	98	9⅞	102	17⅝	95	30	104	8 21/32	88	20/-	74	561
1905	17¾	96	9½	99	19 1/16	104	32⅞	114	8 17/32	87	20/-	74	574
1906	19¼	104	10	104	23¾	130	36½	127	8 27/32	90	20/-	74	629
1907	21⅜	115	10⅜	108	26⅜	146	38¼	134	9⅜	95	20/-	74	672
1908	21½	116	10⅝	110	20¾	113	34⅜	119	9¼	94	20/-	74	626
1909	20½	110	10 1/16	104	19¼	104	32	111	9 1/32	91	20/6	75	595
1910	19	101	10⅛	105	17⅔	93	32	111	9	91	20/6	75	576

TABLE 1G.—MATERIALS.

Year.	13 13/16/= 100. Cement, per Barrel.		10/9½ = 100. Soap, New Zealand, per Hundredweight.		4/2¼ = 100. Matches, per Gross Plaids.		7½d. = 100. Candles, per Pound.		1/6 = 100. Hops, per Pound.		11/6 = 100. Soda-carbonate, per Hundredweight.		5/10¼ = 100. Soda Crystals, per Hundredweight.		Total Index Numbers.
1861	..		46/1½	429	..		17¼	143	..		37/-	322	9/8	165	1059
1862	..		45/1½	419	..		16½	232	..		29/7½	258	8/9	149	1058
1863	25/-	188	41/6	386	..		15¼	215	2/-	134	28/9	250	9/3	158	1331
1864	22/6	169	42/-	390	..		14¼	200	1/10½	125	28/-	243	13/-	222	1349
1865	23/-	172	42/-	390	..		13	183	2/4	156	24/3	211	11/3	192	1304
1866	24/8	185	46/-	428	..		15½	220	2/2	144	23/-	200	13/3	226	1403
1867	24/-	180	46/-	428	..		14½	204	2/2	144	25/6	222	12/9	218	1396
1868	23/-	172	43/6	404	..		13½	190	2/4	156	28/-	243	14/-	238	1403
1869	23/3	174	30/-	[279]	9/4½	223	12½	175	2/6	167	30/-	261	12/7½	215	1494
1870	20/9	155	28/-	260	7/3¾	175	12	169	2/1	139	24/-	209	10/6	179	1286
1871	22/-	165	27/6	254	7/2	[171]	11⅝	164	2/-	134	22/-	[191]	9/6	162	1241
1872	20/-	150	32/-	297	7/3	[173]	11 7/16	161	2/4	156	25/-	218	11/-	188	1343
1873	21/6	161	26/-	[240]	7/4	[175]	11 1/16	156	1/10½	124	25/-	[218]	11/-	[188]	1262
1874	21/6	161	24/-	[221]	7/3	173	10 11/16	151	1/8⅜	115	25/-	[218]	10/6	[179]	1218
1875	21/-	158	22/-	204	6/6	156	10½	148	1/11	128	24/8	215	10/2	173	1182
1876	17/10½	134	17/6	162	6/5¼	153	10½	148	1/7½	108	20/9	181	10/-	170	1056
1877	19/6½	147	16/-	148	6/0¾	145	10¾	151	1/10	122	19/6	169	9/9	166	1048
1878	17/10½	134	16/-	148	5/7¾	135	10 1/16	141	1/7¾	110	19/6	169	9/-	154	991
1879	15/3	115	16/-	148	5/3	126	9⅝	135	1/0¾	71	18/-	156	8/6	145	896
1880	19/-	142	14/-	130	6/-	143	10 7/16	147	1/10½	125	18/-	156	8/6	145	988
1881	16/1½	121	14/-	130	5/-	120	9 15/16	140	2/3	145	18/-	156	8/6	145	957
1882	15/6	116	14/-	130	4/9¾	115	9 5/16	131	2/3½	153	18/-	156	7/-	120	921
1883	14/3	107	14/-	130	4/3	102	10	141	3/6	233	17/9	154	7/-	120	987
1884	15/-	113	13/3	123	4/3	102	10	141	2/3	149	16/9	146	7/-	120	898
1885	15/3	115	13/-	121	4/3	102	10	141	2/1½	142	16/6	143	7/6	128	892
1886	14/9	111	17/6	162	4/3	102	9⅛	128	1/6	100	15/9	137	6/6	111	851
1887	13/-	98	12/3	114	4/3	102	8⅜	118	1/6	100	14/9	128	6/2¼	105	765

1888	15/4½	115	9/10½	92	4/4½	107	8⅛	115	1/6	100	13/4½	117	6/0¾	103	749
1889	17/1½	128	9/6	88	4/9	114	8¼	116	1/9	117	11/6	100	7/-	120	773
1890	16/4½	123	12/-	111	4/6	108	7½	106	1/6	100	11/6	100	6/6	111	759
1891	16/5¼	123	12/-	111	4/6	108	7¾	109	1/6	100	11/6	100	7/0¾	121	772
1892	14/1½	106	12/-	111	4/6	108	7½	106	1/6	100	12/-	104	6/4½	109	744
1893	12/-	90	11/7½	108	4/6	108	7 1/16	100	1/6	100	12/-	104	5/9	98	704
1894	12/7½	95	10/6	97	4/6	108	7⅛	100	1/6	100	11/10½	103	5/9	98	701
1895	11/6¾	87	10/6	97	4/1½	99	7	99	1/6	100	11/6	100	5/9	98	680
1896	11/9¾	88	10/6	97	4/-	96	7⅛	100	1/6	100	11/6	100	5/9	98	679
1897	12/7½	95	10/6	97	4/-	96	7½	106	1/6	100	11/6	100	5/9	98	692
1898	13/1	98	9/3	84	4/-	9/6	6¼	88	1/6	100	11/4½	99	5/1½	88	655
1899	13/7½	102	9/3	84	3/3½	79	6 5/16	89	1/5¼	96	10/3	89	4/7½	79	618
1900	12/11¼	97	10/6	97	3/3¾	80	7	99	1/3	84	9/6	83	4/10½	83	623
1901	13/0¾	98	10/6	97	3/4	80	6¼	88	1/3	84	9/6	83	5/-	85	615
1902	12/7¾	95	12/6	116	3/3¾	80	6	84	1/0¾	71	9/6	83	5/-	85	614
1903	12/5¼	94	12/1½	112	3/4	80	6	84	1/-	67	9/4½	82	5/-	85	604
1904	12/0¾	91	11/-	102	3/-	72	5 15/16	84	1/-	67	8/9	76	5/-	85	577
1905	11/11¼	90	11/-	102	3/-	72	5⅞	83	1/-	67	8/9	76	5/-	85	575
1906	11/8¼	88	11/-	102	3/-	72	5¾	81	1/-	67	9/4½	82	5/-	85	577
1907	12/6	94	13/-	121	3/4	80	5⅞	83	1/-	67	10/-	87	5/-	85	617
1908	12/1½	91	13/-	121	3/6	84	6⅜	90	1/-	67	9/9	85	5/-	85	623
1909	11/9½	88	13/-	121	3/6½	85	6½	91	1/-	67	10/-	87	5/3	90	629
1910	11/9	88	13/6	125	3/10½	93	6⅜	89	9	50	10/-	87	5/3	90	622

Table 1h.—Other Foods.

Year.	£24 2/20 = 100. Sugar, per Ton.		4 7/20 d. = 100. Currants, per Pound.		6d. = 100. Sultanas, per Pound.		£20 3/4 = 100 Rice, per Ton.		1 3/20 d. = 100. Sago, per Pound.		£3 1/5 = 100. Salt, per Ton.		7/4 1/2 = 100. Salmon, per Dozen Tins.		1/0 3/4 d. = 100. Pepper, White, per Pound.		Total Index Numbers.
1861	56 3/4	233	5 5/8	134	10 1/4	171	23	111	..		6 1/6	162	18/-	244	11 1/2 d.	93	1148
1862	55 1/4	228	6 1/2	150	8	133	32	154	..		5 1/4	139	19/3	261	11 3/8 d.	90	1155
1863	57 1/2	235	6 1/4	144	7 1/4	121	32	154	..		5	132	18/-	244	1/1	105	1135
1864	54 1/4	222	5 3/8	124	8 1/2	138	29	140	4 3/4	260	5 7/8	155	18/3	248	1/0 3/8	102	1389
1865	53 1/4	218	5 1/4	121	7 1/2	125	26 1/2	127	4 3/4	260	6 1/8	161	17/3	234	10 3/4 d.	87	1333
1866	54 1/2	224	6 9/16	151	10 1/2	175	27 1/2	133	4 1/2	250	5 3/8	141	18/-	244	11d.	89	1407
1867	52 7/8	216	5 11/16	132	11 1/2	192	30	145	4 3/4	260	5 3/8	141	17/6	237	9 5/8 d.	78	1401
1868	51 3/4	212	5 1/4	121	9 1/8	152	35	169	4 1/2	250	6 7/8	181	17/9	241	10 3/8 d.	86	1412
1869	52 3/4	216	4 1/4	98	8	133	30 1/4	148	4 3/8	242	5 1/16	134	17/-	230	11d.	89	1290
1870	47 7/8	197	5 7/16	126	7 1/2	125	25 3/4	124	4	222	4 5/8	122	17/-	230	11d.	89	1235
1871	52	213	5 15/16	137	8	133	27 1/2	133	3 3/4	208	4 3/8	115	16/9	227	1/1	[105]	1271
1872	50 7/8	209	4 15/16	114	7 1/4	121	29 1/2	142	3 5/8	201	4 7/8	129	15/-	210	1/8	162	1278
1873	50 1/8	206	4 5/8	111	8 1/4	138	30 3/8	148	3 5/8	201	4 1/2	119	15/-	210	1/6	145	1278
1874	45 1/4	186	4 3/8	109	7 1/4	121	29 1/2	142	3 5/8	201	4 7/16	118	14/3	193	1/4	130	1200
1875	41 1/4	168	4 3/8	109	7 1/4	121	30	145	3 1/2	193	3 3/4	99	11/-	153	1/0 1/2	101	1089
1876	38 1/4	157	4 13/16	111	8 1/2	142	30	145	3 1/2	193	4 3/8	115	8/9	119	11 1/4 d.	91	1073
1877	38 3/4	158	4 11/16	109	7 3/16	120	30	145	3 1/2	193	5 5/8	148	11/7 1/2	158	9 3/4 d.	79	1110
1878	44 1/8	181	4 1/2	104	6	100	27	130	3	166	4 1/8	109	9/3	125	9 1/4 d.	75	990
1879	41 1/4	169	3 3/4	87	5 3/4	96	25 3/4	124	3	166	4	106	8/5 1/4	114	9d.	73	935
1880	46 1/2	191	5 15/16	137	7 1/4	121	24	116	3	166	5 3/4	152	8/10 1/2	120	9d.	73	1076
1881	42 1/4	173	5 15/16	137	7 11/16	128	26	125	3 1/4	175	4	106	8/4 1/2	114	9d.	73	1031
1882	41 1/2	168	5 1/8	118	7 7/8	131	26	125	2 1/4	124	3 3/4	99	8/3 3/4	113	9d.	73	951
1883	40 16/16	168	5 3/32	118	7 1/4	121	24 1/2	118	2 1/4	124	3 3/8	89	8/4 1/2	114	11 1/4 d.	91	943
1884	40	164	5 1/4	121	7	117	22 1/2	108	2	111	3 1/2	93	7/6 3/4	102	1/1	105	921
1885	32	131	4 3/4	110	6 1/4	104	20 1/4	98	2	111	4	106	7/-	95	1/1	105	860
1886	28 7/8	119	5	115	6 1/2	102	21	101	2	111	3 3/8	89	7/6	101	1/1	105	843
1887	26 7/8	110	5 3/8	123	5 7/8	98	18 3/4	90	2 1/4	124	3 3/8	89	8/3 1/4	113	1/2 1/2	117	864

60

1888	26 1/2	109	5 1/4	121	6 5/16	106	18	87	2 3/8	131	3 5/8	96	9/3 1/4	126	1/4 1/2	133	909
1889	32 1/4	133	4 3/4	110	5 3/4	96	18 7/8	91	2	111	4 13/16	127	9/3 3/4	126	1/6	145	939
1890	28 1/8	117	5 1/16	117	7 1/4	120	21 1/2	104	2	111	4 3/4	126	8/3 1/4	113	1/5 1/2	141	939
1891	27 1/4	112	5	115	9 1/8	153	22 3/8	108	2	111	4 1/2	119	7/7 1/2	103	1/5 1/2	141	962
1892	26 1/2	109	4 11/16	109	4 9/16	77	20 7/8	101	2	111	3 7/8	102	7/3	98	1/5	137	844
1893	25 1/2	105	4 3/8	101	4 6/16	73	18 1/2	88	2	111	3 1/2	93	7/4 1/2	100	1/5	137	808
1894	25 1/4	104	3 5/8	84	4 1/2	75	19 5/8	95	1 7/8	104	3 11/16	97	7/6	101	1/0 1/2	101	761
1895	23	94	3 3/4	87	4 15/16	83	19 1/4	92	1 3/4	97	3 5/16	88	7/6	101	8d.	65	707
1896	23 1/4	95	3 13/16	88	4 13/16	81	19 1/8	92	1 3/4	97	3 9/16	94	7/6	101	8d.	65	713
1897	21 3/4	89	4 1/4	98	6 5/16	106	20 1/8	97	1 3/4	97	3 13/16	100	7/6	101	6d.	48	736
1898	21 1/2	88	4 3/4	109	6 5/8	111	24	116	1 3/8	76	3 5/8	96	6/6	88	9d.	73	757
1899	21 3/4	89	4 5/32	96	7 3/16	120	21 1/2	103	1 1/2	84	3 3/8	89	6/7 1/2	90	1/-	97	768
1900	22 5/8	93	5	115	6 1/8	102	20 1/2	99	1 13/16	101	3 1/8	83	6/10 1/2	93	1/-	97	783
1901	22 30/32	94	5 5/16	123	5 7/8	98	15 3/8	74	1 5/8	89	2 3/4	73	8/3	112	1/-	97	760
1902	20 5/8	85	3 7/16	80	5 3/8	90	15 1/4	73	1 9/16	86	2 33/64	74	7/-	95	1/2 1/2	117	700
1903	21 1/4	87	3 1/16	71	4 15/16	83	16 5/8	80	1 1/8	64	2 11/16	71	7/3	98	1/0 1/2	101	651
1904	21	86	3	70	3 7/16	57	15 7/8	76	1 3/4	67	2 13/16	74	8/3	112	1/1	105	647
1905	23 3/8	96	2 13/16	65	3 1/4	54	15 1/16	73	1 11/32	73	3 1/8	83	8/6	115	1/1	105	664
1906	21 11/16	89	3 5/8	84	3 1/2	58	16 3/16	78	2 9/16	120	2 15/16	78	7/6	101	1/-	97	705
1907	20 7/8	86	4 1/8	95	5 5/8	94	16	77	2 1/8	138	3 7/16	91	7/6	101	11d.	89	771
1908	16 1/4	67	2 13/16	62	3 7/16	57	16	77	1 3/4	97	3 1/2	93	7/6	101	9 1/4 d.	75	629
1909	16 7/8	69	2 3/4	63	3	50	15 1/4	73	1 1/2	84	3 15/16	104	8/-	108	9 1/8 d.	77	628
1910	18 7/16	75	3 1/8	72	4 1/16	68	14 1/2	70	1 3/4	97	3 5/8	96	8/-	108	9 1/2 d.	77	663

61

TABLE 1K.—SUMMARY OF THE INDEX NUMBERS OF FOREGOING TABLES.

[NOTE.—The figures in the columns are the annual aggregates of the index numbers of the various articles included in each group. The small number shows the number of commodities included in the group in any particular year. The number in bold type is the index number showing the level of general prices. It is the index number which is so often referred to as *the number derived from Table I.*]

Year.	Agricultural Products.	Pastoral Products.	Beverages.	Oils.	Minerals.	Materials.	Other Food-stuffs.	Liquors.	Grand Totals.	Number of Articles.	Annual Index Numbers.
1861	5 1055	4 693	2 315	2 456	5 923	4 1059	7 1148	4 436	6085	33	**184**
1862	5 985	4 690	2 309	2 537	5 971	4 1059	7 1155	4 437	6143	33	**186**
1863	5 1070	5 1133	2 305	2 552	6 1135	6 1331	7 1135	4 471	7132	37	**193**
1864	5 1123	5 1043	2 323	3 816	6 1105	6 1349	8 1389	4 463	7611	39	**195**
1865	5 1031	5 986	2 311	3 845	6 1063	6 1304	8 1333	4 499	7372	39	**189**
1866	5 1011	5 1232	2 309	3 837	5 898	6 1403	8 1407	4 494	7591	38	**200**
1867	5 786	5 1069	2 337	3 802	4 720	6 1396	8 1401	4 395	6906	37	**187**
1868	5 877	5 1049	2 285	3 689	4 702	6 1403	8 1412	4 385	6802	37	**184**
1869	5 695	5 790	2 278	3 654	4 636	7 1494	8 1290	4 385	6222	38	**164**
1870	5 621	5 692	2 295	3 661	4 583	7 1286	8 1235	4 493	5866	38	**154**
1871	5 631	5 584	2 300	3 570	4 640	7 1241	8 1271	4 456	5693	38	**150**
1872	5 644	5 619	2 222	3 567	4 722	7 1343	8 1278	4 469	5864	38	**154**
1873	5 833	5 724	2 236	3 567	4 884	7 1262	8 1278	4 447	6231	38	**164**
1874	5 884	5 757	2 276	3 517	5 976	7 1218	8 1200	4 450	6278	39	**161**
1875	5 632	5 846	3 372	3 466	6 1040	7 1182	8 1089	4 434	6061	41	**148**
1876	5 531	5 871	3 376	3 442	6 965	7 1056	8 1073	4 439	5753	41	**140**
1877	5 792	6 877	3 376	3 471	6 942	7 1048	8 1110	4 444	6060	42	**144**
1878	5 817	6 776	3 376	3 451	6 837	7 991	8 990	4 411	5637	42	**135**
1879	5 748	6 805	3 376	3 431	6 709	7 896	8 935	4 416	5316	42	**127**
1880	5 554	6 832	3 386	3 426	6 786	7 988	8 1076	5 541	5589	43	**130**
1881	5 537	6 800	3 392	3 409	6 742	7 957	8 1031	5 534	5402	44	**126**
1882	5 630	7 912	3 383	3 363	6 699	7 921	8 951	5 529	5388	44	**122**
1883	5 608	7 843	3 361	3 371	6 662	7 886	8 943	5 510	5184	44	**118**
1884	5 556	7 790	3 363	3 370	6 635	7 898	8 921	5 520	5053	44	**115**
1885	5 483	7 802	3 348	3 351	6 607	7 892	8 860	5 520	4863	44	**111**
1886	5 534	7 759	3 342	3 327	6 573	7 851	8 843	5 518	4747	44	**108**
1887	5 501	8 798	3 298	3 317	6 566	7 765	8 864	5 516	4625	45	**103**

1888	5 497	8 745	3 298	3 319	6 593	7 749	8 909	5 510	4620	45	**103**
1889	5 625	8 906	3 298	3 332	6 637	7 773	8 939	5 497	5007	45	**111**
1890	5 462	8 838	3 295	3 345	6 699	7 759	8 939	5 498	4835	45	**107**
1891	5 499	8 818	3 299	3 329	6 685	7 772	8 962	5 498	4862	45	**108**
1892	5 527	8 814	3 307	3 292	6 657	7 744	8 844	5 498	4683	45	**104**
1893	5 464	8 837	3 307	3 270	6 604	7 704	8 808	5 498	4492	45	**100**
1894	5 438	8 837	3 307	3 278	6 579	7 701	8 761	5 497	4398	45	**98**
1895	5 427	8 753	3 307	3 272	6 559	7 680	8 707	5 498	4203	45	**93**
1896	5 522	8 749	3 295	3 283	6 554	7 679	8 713	5 508	4303	45	**96**
1897	5 596	8 702	3 295	3 309	6 545	7 692	8 736	5 507	4382	45	**97**
1898	5 618	8 721	3 295	3 285	6 546	7 655	8 757	5 507	4384	45	**97**
1899	5 408	8 922	3 295	3 288	6 606	7 618	8 768	5 505	4410	45	**98**
1900	5 419	8 906	3 295	3 315	6 692	7 623	8 783	5 494	4527	45	**101**
1901	5 408	8 894	3 295	3 321	6 644	7 615	8 760	5 494	4431	45	**98**
1902	5 568	8 947	3 295	3 310	6 588	7 614	8 700	5 496	4512	45	**100**
1903	5 547	8 1022	3 294	3 290	6 577	7 604	8 651	5 496	4481	45	**100**
1904	5 438	8 1005	3 294	3 258	6 561	7 577	8 647	5 498	4278	45	**95**
1905	5 497	8 1047	3 294	3 255	6 574	7 575	8 664	5 496	4402	45	**98**
1906	5 525	8 1058	3 294	3 279	6 629	7 577	8 705	5 497	4564	45	**101**
1907	5 607	8 1033	3 294	3 300	6 672	7 618	8 771	5 498	4793	45	**107**
1908	5 667	8 1073	3 282	3 271	6 626	7 623	8 629	5 508	4675	45	**104**
1909	5 522	8 1054	3 322	3 268	6 595	7 630	8 628	5 520	4540	45	**101**
1910	5 552	8 1078	3 322	3 317	6 576	7 622	8 663	5 520	4650	45	**103**

Table 2A.—Index Numbers compared.

Year.	New Zealand, 1890–99 = 100.	"Economist," 1845–50 = 100.	Sauerbeck, 1867–77 = 100.	Falkner (America).
1861 ..	184	124	98	101
1862 ..	186	131	101	118
1863 ..	193	159	103	148
1864 ..	195	172	105	199
1865 ..	189	163	101	217
1866 ..	200	162	102	191
1867 ..	187	137	100	172
1868 ..	184	122	99	161
1869 ..	164	121	98	154
1870 ..	154	122	96	142
1871 ..	150	118	100	136
1872 ..	154	129	109	139
1873 ..	164	134	111	138
1874 ..	161	131	102	133
1875 ..	148	126	96	128
1876 ..	140	123	95	118
1877 ..	144	123	94	111
1878 ..	135	115	87	101
1879 ..	127	101	83	97
1880 ..	130	115	88	107
1881 ..	126	108	85	106
1882 ..	122	111	84	109
1883 ..	118	106	82	106
1884 ..	115	101	76	99
1885 ..	111	95	72	93
1886 ..	108	92	69	92
1887 ..	103	94	68	93
1888 ..	103	101	70	94
1889 ..	111	99	72	94
1890 ..	107	102	72	92
1891 ..	108	102	72	91
1892 ..	104	97	68	87
1893 ..	100	96	68	88
1894 ..	98	95	63	81
1895 ..	93	87	62	77
1896 ..	96	91	61	77
1897 ..	97	88	62	74
1898 ..	97	86	64	75
1899 ..	98	87	68	78
1900 ..	101	97	75	..
1901 ..	98	97	70	..
1902 ..	100	89	69	..
1903 ..	100	91	69	..
1904 ..	95	99	70	..
1905 ..	98	100	72	..
1906 ..	101	108	77	..
1907 ..	107	113	80	..
1908 ..	104	101	73	..
1909 ..	101	102	74	..
1910 ..	103	..	78	..

Table 2B.—Further Comparisons.

Year.	1. New Zealand, 1890–99 = 100.	2. "Economist," 1890–99 = 100.	3. Sauerbeck, 1890–99 = 100.	4. New Zealand, by Median.
1861 ..	184	133	149	172
1862 ..	187	141	153	172
1863 ..	193	171	156	176
1864 ..	195	185	159	185
1865 ..	189	175	153	183
1866 ..	200	174	155	187
1867 ..	187	149	152	192
1868 ..	184	131	150	189
1869 ..	164	130	149	163
1870 ..	154	131	146	148
1871 ..	150	127	152	137
1872 ..	154	139	165	154
1873 ..	164	144	168	152
1874 ..	161	140	155	160
1875 ..	148	135	146	148
1876 ..	140	132	144	134
1877 ..	144	132	142	148
1878 ..	135	124	132	133
1879 ..	127	109	126	125
1880 ..	130	124	133	129
1881 ..	125	116	129	125
1882 ..	123	119	127	122
1883 ..	118	114	124	118
1884 ..	115	109	115	113
1885 ..	111	102	109	110
1886 ..	108	99	105	107
1887 ..	103	101	103	102
1888 ..	103	109	106	104
1889 ..	111	106	109	111
1890 ..	107	110	109	108
1891 ..	108	110	109	108
1892 ..	104	104	103	102
1893 ..	100	103	96	100
1894 ..	98	102	96	100
1895 ..	93	94	94	96
1896 ..	96	98	92	98
1897 ..	97	95	94	98
1898 ..	97	93	94	96
1899 ..	98	94	103	96
1900 ..	101	104	114	99
1901 ..	98	104	106	98
1902 ..	100	96	105	100
1903 ..	100	98	105	100
1904 ..	95	106	106	95
1905 ..	98	108	109	99
1906 ..	101	116	116	100
1907 ..	107	121	121	101
1908 ..	104	109	111	101
1909 ..	101	110	112	104
1910 ..	103	..	118	101

TABLE 3A.—DECADE AVERAGES.

Decade.	New Zealand, Standard Period, 1890–99.	"Economist," Standard Period, 1845–50.	Sauerbeck, Standard Period, 1867–77.	New Zealand, Median.
1861–70 ..	184	141	100	177
1862–71 ..	180	141	101	173
1863–72 ..	177	141	101	171
1864–73 ..	174	138	102	169
1865–74 ..	171	134	102	167
1866–75 ..	167	130	101	163
1867–76 ..	161	126	101	158
1868–77 ..	156	125	100	153
1869–78 ..	151	124	99	148
1870–79 ..	148	122	97	144
1871–80 ..	145	122	97	142
1872–81 ..	143	121	95	141
1873–82 ..	140	119	93	138
1874–83 ..	135	116	90	134
1875–84 ..	130	113	87	130
1876–85 ..	127	110	85	126
1877–86 ..	124	107	82	123
1878–87 ..	119	104	79	119
1879–88 ..	116	102	78	116
1880–89 ..	115	102	76	114
1881–90 ..	112	101	75	112
1882–91 ..	111	100	74	110
1883–92 ..	109	99	72	108
1884–93 ..	107	98	71	107
1885–94 ..	105	97	69	105
1886–95 ..	104	97	68	104
1887–96 ..	102	96	68	103
1888–97 ..	102	96	67	102
1889–98 ..	101	94	66	102
1890–99 ..	100	93	66	100
1891–1900 ..	99	93	66	100
1892–1901 ..	98	92	66	99
1893–1902 ..	98	91	66	98
1894–1903 ..	98	91	66	98
1895–1904 ..	98	91	67	98
1896–1905 ..	98	93	68	98
1897–1906 ..	99	94	70	98
1898–1907 ..	100	97	71	98
1899–1908 ..	100	98	72	99
1900–1909 ..	101	100	73	100
1901–1910 ..	101	..	73	100

TABLE 3B.—DECADE AVERAGES.

Decade.	New Zealand, Standard Period, 1890–99.	"Economist," Standard Period, 1890–99.	Sauerbeck, Standard Period, 1890–99.	New Zealand, by Median.
1861–70 ..	184	152	152	177
1862–71 ..	180	151	153	173
1863–72 ..	178	151	154	171
1864–73 ..	174	149	155	169
1865–74 ..	171	144	155	167
1866–75 ..	167	140	154	163
1867–76 ..	161	136	153	158
1868–77 ..	156	134	152	153
1869–78 ..	151	133	150	148
1870–79 ..	148	131	148	144
1871–80 ..	145	131	146	142
1872–81 ..	143	130	144	141
1873–82 ..	140	128	140	138
1874–83 ..	135	125	136	134
1875–84 ..	130	121	132	130
1876–85 ..	127	118	128	126
1877–86 ..	124	115	124	123
1878–87 ..	119	112	120	119
1879–88 ..	116	110	118	116
1880–89 ..	115	110	116	114
1881–90 ..	112	109	114	112
1882–91 ..	111	108	112	110
1883–92 ..	109	106	109	108
1884–93 ..	107	105	106	107
1885–94 ..	105	105	105	105
1886–95 ..	104	104	103	104
1887–96 ..	102	104	102	103
1888–97 ..	102	103	101	102
1889–98 ..	101	102	100	102
1890–99 ..	100	100	100	100
1891–1900 ..	99	100	100	100
1892–1901 ..	98	99	99	99
1893–1902 ..	98	98	99	98
1894–1903 ..	98	98	101	98
1895–1904 ..	98	98	102	98
1896–1905 ..	98	100	104	98
1897–1906 ..	99	101	105	98
1898–1907 ..	100	104	108	98
1899–1908 ..	100	106	110	99
1900–1909 ..	101	107	111	100
1901–1910 ..	101	..	111	100

Table 4A.—Farm and Non-farm Products.

[Note.—The standard price is the average annual price over the standard period—the decade 1890–99.]

Year.	Farm Products.	Non-farm Products.	All Commodities, New Zealand.	All Commodities, Sauerbeck.
1861 ..	194	181	184	149
1862 ..	186	186	186	153
1863 ..	220	183	193	156
1864 ..	217	188	195	159
1865 ..	202	185	189	153
1866 ..	224	191	200	155
1867 ..	186	187	187	152
1868 ..	193	181	184	150
1869 ..	149	169	164	149
1870 ..	131	163	154	146
1871 ..	122	160	150	152
1872 ..	126	164	154	165
1873 ..	156	167	164	169
1874 ..	164	160	161	155
1875 ..	148	148	148	146
1876 ..	140	140	140	144
1877 ..	152	142	144	142
1878 ..	145	131	135	132
1879 ..	141	121	127	126
1880 ..	126	131	130	133
1881 ..	122	127	125	129
1882 ..	129	120	122	127
1883 ..	121	117	118	124
1884 ..	112	116	115	115
1885 ..	107	112	111	109
1886 ..	108	108	108	105
1887 ..	100	104	103	103
1888 ..	96	106	103	106
1889 ..	118	109	111	109
1890 ..	100	110	107	109
1891 ..	101	111	108	109
1892 ..	103	104	104	103
1893 ..	100	100	100	96
1894 ..	98	98	98	96
1895 ..	91	94	93	94
1896 ..	98	95	96	92
1897 ..	100	96	97	94
1898 ..	103	95	97	94
1899 ..	102	96	98	103
1900 ..	102	100	101	114
1901 ..	100	98	98	106
1902 ..	117	94	100	105
1903 ..	121	91	100	105
1904 ..	111	89	95	106
1905 ..	119	89	98	109
1906 ..	122	93	101	116
1907 ..	126	99	107	121
1908 ..	134	92	104	111
1909 ..	121	93	101	112
1910	127	94	103	118

Table 4B.—Farm and Non-farm Products.

Decade.	Farm Products, New Zealand.	Non-farm Products, New Zealand.	All New Zealand Commodities.
1861–70	190	181	184
1862–71	183	179	180
1863–72	177	177	177
1864–73	171	176	174
1865–74	165	173	171
1866–75	160	169	167
1867–76	152	164	161
1868–77	148	159	156
1869–78	143	154	151
1870–79	142	150	148
1871–80	142	146	145
1872–81	142	143	143
1873–82	142	139	140
1874–83	139	134	135
1875–84	134	129	130
1876–85	129	126	127
1877–86	126	123	124
1878–87	121	119	119
1879–88	116	116	116
1880–89	114	115	115
1881–90	111	113	112
1882–91	109	111	111
1883–92	107	110	109
1884–93	105	108	107
1885–94	103	106	105
1886–95	102	104	104
1887–96	101	103	102
1888–97	101	102	102
1889–98	101	101	101
1890–99	100	100	100
1891–1900	100	99	99
1892–1901	100	98	98
1893–1902	101	97	98
1894–1903	103	96	98
1895–1904	105	95	98
1896–1905	107	94	98
1897–1906	110	94	99
1898–1907	112	94	100
1899–1908	115	94	100
1900–1909	117	94	101
1901–1910	120	93	101

TABLE 5.—INDEX NUMBER BASED ON FOREIGN TRADE AND SHIPPING.

Year.	Total Foreign Trade. '000 omitted.	Total Tonnage. '000 omitted.	Index Numbers; A—Trade.	Index Numbers, B—Tonnage.	A/B Index Numbers, Prices.	Per-centage Ballast.
	£					
1861 ..	3,833	403	23	30	77	..
1862 ..	6,984	590	42	34	124	..
1863 ..	10,378	815	63	61	103	..
1864 ..	10,050	860	61	64	95	30
1865 ..	9,097	580	55	43	128	28
1866 ..	10,290	637	62	47	132	21
1867 ..	9,823	618	59	46	128	21
1868 ..	9,253	564	56	41	137	19
1869 ..	9,066	498	55	37	149	16
1870 ..	9,183	538	55	40	138	13
1871 ..	9,259	540	56	40	140	11
1872 ..	10,250	585	62	44	141	14
1873 ..	11,940	570	72	42	171	20
1874 ..	13,273	695	80	52	154	24
1875 ..	13,505	844	81	62	131	24
1876 ..	12,394	786	74	59	125	19
1877 ..	13,032	789	78	59	132	16
1878 ..	14,540	885	87	66	132	16
1879 ..	13,938	950	83	70	119	20
1880 ..	12,264	820	74	61	121	10
1881 ..	13,220	824	79	61	127	9
1882 ..	14,863	900	89	67	133	10
1883 ..	14,730	1,002	88	74	119	10
1884 ..	14,605	1,063	87	79	110	6
1885 ..	14,071	1,033	84	76	111	6
1886 ..	13,145	991	79	73	108	6
1887 ..	12,796	983	77	73	105	6
1888 ..	13,197	1,058	79	79	100	8
1889 ..	15,350	1,196	92	89	103	10
1890 ..	15,687	1,312	94	97	97	12
1891 ..	15,904	1,244	95	92	103	8
1892 ..	16,309	1,331	98	99	99	9
1893 ..	15,469	1,258	93	93	100	7
1894 ..	15,873	1,262	95	93	102	5
1895 ..	14,790	1,322	87	98	91	5
1896 ..	16,315	1,242	98	92	107	4
1897 ..	17,651	1,362	106	101	105	5
1898 ..	18,555	1,531	111	113	98	5
1899 ..	20,539	1,629	123	121	102	6
1900 ..	23,701	1,680	142	124	115	9
1901 ..	24,508	2,139	147	159	92	9
1902 ..	24,825	2,138	149	159	94	9
1903 ..	27,625	2,215	165	164	101	8
1904 ..	27,893	2,299	167	170	98	9
1905 ..	28,332	2,281	169	169	100	8
1906 ..	33,052	2,482	199	184	108	7
1907 ..	37,086	2,480	222	184	121	9
1908 ..	33,790	2,692	202	200	101	12
1909 ..	35,340	2,518	205	187	110	..

TABLE 6.—INDEX NUMBER BASED ON FOREIGN TRADE PER HEAD OF POPULATION.

Year.	Index Number, A—Population.	Index Number, B—Foreign Trade.	B/A Index Number Prices.	Index Number from Table 1K.
1861 ..	14	23	164	184
1862 ..	18	42	233	186
1863 ..	24	63	263	193
1864 ..	25	61	244	195
1865 ..	28	55	196	189
1866 ..	30	62	206	200
1867 ..	32	59	184	187
1868 ..	33	56	170	184
1869 ..	34	55	162	164
1870 ..	36	55	153	154
1871 ..	34	56	144	150
1872 ..	41	62	151	154
1873 ..	43	72	167	164
1874 ..	50	80	160	161
1875 ..	54	81	150	148
1876 ..	58	74	128	140
1877 ..	59	78	132	144
1878 ..	63	87	138	134
1879 ..	67	83	124	127
1880 ..	70	74	106	130
1881 ..	73	79	108	125
1882 ..	75	89	119	122
1883 ..	79	88	111	118
1884 ..	82	87	106	115
1885 ..	83	84	101	111
1886 ..	85	79	93	108
1887 ..	87	77	89	103
1888 ..	88	79	90	103
1889 ..	89	92	103	111
1890 ..	91	94	103	107
1891 ..	92	95	103	108
1892 ..	94	98	104	104
1893 ..	97	93	96	100
1894 ..	99	95	96	98
1895 ..	100	87	87	93
1896 ..	103	98	95	96
1897 ..	106	106	100	97
1898 ..	108	111	103	97
1899 ..	110	123	112	98
1900 ..	111	142	128	101
1901 ..	114	147	129	98
1902 ..	117	149	127	100
1903 ..	122	165	135	100
1904 ..	124	167	135	95
1905 ..	128	169	132	98
1906 ..	132	199	151	101
1907 ..	135	221	164	107
1908 ..	139	202	145	104
1909 ..	141	205	145	101
1910 ..	144	228	158	103

[NOTE.—In tables 5 and 6 the standard period is the same: the decade 1890–99. The standard volume of trade, tonnage, &c., is the annual average of the standard decade.]

Table 7.—Index Numbers of the Marriage and the Bankruptcy Rate.

[Note.—This table contains various index numbers, all based on a similiar standard—*e.g.* standard marriage-rate = average annual number of marriages per thousand of population during the decade, 1890–99 = 100. In all the columns the standard period is the decade, 1890–99.]

Year.	All Commodities, N.Z.	Marriage-rate.	Bankruptcy-rate.	Farm Products, N.Z.
1861 ..	184	139	..	194
1862 ..	186	133	..	186
1863 ..	193	139	..	220
1864 ..	195	162	..	217
1865 ..	189	153	..	202
1866 ..	200	153	657	224
1867 ..	187	147	877	186
1868 ..	184	139	235	193
1869 ..	164	124	342	149
1870 ..	154	116	411	131
1871 ..	150	108	260	122
1872 ..	154	101	211	126
1873 ..	164	120	201	156
1874 ..	161	124	151	164
1875 ..	148	135	199	148
1876 ..	140	124	190	140
1877 ..	144	116	338	152
1878 ..	135	120	330	145
1879 ..	127	108	548	141
1880 ..	130	104	411	126
1881 ..	125	103	396	122
1882 ..	122	109	356	129
1883 ..	118	106	412	121
1884 ..	115	106	205	112
1885 ..	111	103	233	107
1886 ..	108	93	246	108
1887 ..	103	93	230	100
1888 ..	103	93	195	96
1889 ..	111	92	165	118
1890 ..	107	95	142	100
1891 ..	108	94	130	101
1892 ..	104	96	107	103
1893 ..	100	96	100	100
1894 ..	98	95	129	98
1895 ..	93	92	96	91
1896 ..	96	106	80	98
1897 ..	97	106	79	100
1898 ..	97	107	74	103
1899 ..	98	113	70	102
1900 ..	101	119	56	102
1901 ..	98	121	39	100
1902 ..	100	124	34	117
1903 ..	100	127	31	121
1904 ..	95	128	41	111
1905 ..	98	128	47	119
1906 ..	101	131	52	122
1907 ..	107	138	53	126
1908 ..	104	137	61	134
1909 ..	101	129	71	121

Table 8.—Various Index Numbers.

[Note.—This table contains index numbers similarly constructed. The yield of wheat however, is given not in index numbers, but in bushels per acre. In all the other columns the annual average over the standard period 1890–99 = 100.]

Year.	Gold-production, World.	Gold-production, New Zealand.	Index Number, New Zealand Prices.	Price of Wheat.	Wheat-yield per Acre.	Population.
1861	63	73	184	176	..	14
1862	63	154	186	139	..	18
1863	63	233	193	163	..	24
1864	63	179	195	254	..	25
1865	63	213	189	212	..	28
1866	66	273	200	150	..	30
1867	66	260	187	101	..	32
1868	66	240	184	178	..	33
1869	66	227	164	124	25	34
1870	66	208	154	111	27	36
1871	59	267	150	137	23½	34
1872	59	167	155	129	22½	41
1873	49	190	162	140	24	43
1874	46	144	161	135	25½	50
1875	51	135	148	122	28	54
1876	53	123	140	126	31½	58
1877	58	144	144	176	28½	59
1878	61	119	134	124	26	63
1879	55	109	127	87	23	67
1880	54	117	130	122	28	70
1881	52	104	125	120	25	73
1882	52	96	122	126	22½	75
1883	48	96	118	124	26½	79
1884	52	88	115	106	26	82
1885	55	90	111	87	25½	83
1886	54	87	108	110	24½	85
1887	54	79	103	109	25	87
1888	56	77	103	88	26½	88
1889	63	77	111	113	24	89
1890	60	75	107	92	25	91
1891	66	96	108	113	19	92
1892	75	92	104	117	25½	94
1893	80	88	100	81	22	97
1894	92	85	98	73	20	99
1895	101	112	93	86	24½	100
1896	103	100	96	106	28	103
1897	120	97	97	125	23	106
1898	146	104	97	124	18	108
1899	156	146	98	75	33	110
1900	130	138	101	70	32	111
1901	133	169	98	71	31½	114
1902	151	188	100	103	25	117
1903	167	196	100	122	38½	122
1904	177	190	95	92	34	124
1905	192	202	98	92	35½	128
1906	203	219	101	94	30½	132
1907	204	196	107	110	27	135
1908	202	197	104	131	29	139
1909	210	197	101	120	26	141
1910	..	..	103	107	26	144

CHAPTER VIII.—GENERAL REVIEW OF THE ANNUAL INDEX NUMBERS.

Annual Averages.

An examination of the index numbers reveals a heavy and practically continuous decline down almost to the end of the century. Taking the figures year by year, we find that in 1861 the index number stood at 184, rising by 1864 to 195. By 1870 the number had fallen to 154, the fall being uninterrupted with the single exception of an abrupt rise to 200 in 1866. The decade 1870–79, which opened with the index number at 154, and closed with it at 127, shows more fluctuations than the previous one. It was evidently a period of great commercial disturbance, particularly the years 1873 and 1874, the index numbers of which stood at 164 and 161 respectively. The decade 1880–89 opened with a rise in the index number to 130, but the rise was only temporary, the index numbers reaching their lowest point, 103, in 1887; a short period of rising prices following gave an index number of 103 for 1888, and 111 for 1889. The same tendency to fall continued during the next decade, prices reaching 98 in 1899. As in the previous decade, a heavy fall in the middle was followed by a slight rise towards the end. The present century has witnessed a similar peculiarity, prices falling from 101 in 1900 to 95 in 1904, and rising again to 107 in 1907, but falling to 101 in 1909. This tendency to periodicity is so marked as to suggest the operation of some psychologic economic law.

Decade Averages.

The fall in the general price-level is more strikingly illustrated when we examine not the index numbers for individual years, but their averages over a period of years—say, a decade (*vide* Table 3A). By this means we eliminate all short-lived variations, which may be due to some violent fluctuation in the supply of a commodity or group of commodities, or to some violent but short-lived fluctuation in credit.

Judging in this manner, we find that from the decade 1861–70, through every possible decade (thirty-five in all) to the decade 1895–1904, there was a continuous fall in the index numbers. In no single instance was the index number of any decade higher than that of the preceding decade. A slight rise is manifest in the remaining decades. As might be expected from the previous table (Table 2A), the fall is the more evident in the decades comprised between 1864–87. Thenceforth the decline, though persistent, is more gradual, till in the five decades whose initial years were 1892, 1893, 1894, 1895, and 1896, the index number was practically stationary, never rising above 98, nor falling below 97. During the decades ending 1909 and 1910, however, the index number rose to 101.

Comparison of Index Numbers with English Prices.

I have compared my index numbers with those of Sauerbeck, and find a marked coincidence. Like mine, his reveal a heavy and almost continuous fall. If we take the period 1860–69 we find that in both tables the index number rose from 1861 to 1864; that a slight fall in 1865 was succeeded by a slight rise in 1866; but that the numbers again fell coincidently till 1869. From 1870 to 1879 both tables give evidence of a heavy fall in prices. Both, too, show this particular decade to have been one of somewhat violent fluctuations. One feature, however, is deserving of special notice. In New Zealand, 1870 was a period of falling prices—a fall which continued in 1871, but which was converted into an appreciation in 1872, 1873, and 1874. But, according to Sauerbeck's tables, the appreciation in English prices took place in 1871, 1872, and 1873. The effect of the appreciation of English prices seems to have exerted its influence in New Zealand principally in raising the price of agricultural, pastoral, and mineral products. In New Zealand a very marked decline took place in 1875, prices falling 8 per cent. on those of the preceding year; but in England a fall of precisely the same amount took place in the year 1874. Thus it appears that the waves of inflation and depression which swept the commercial world at that time, originated in Europe, and did not reach our shores till approximately a year later.

A comparison of the tables of Falkner (U.S.A.) reveals that America, like New Zealand, did not experience the wave of inflated prices till 1872.

From 1874 to 1880 the fall is uninterrupted, both in New Zealand and in England, except in 1877, when the New Zealand index rises slightly, owing to an abrupt rise in the price of agricultural products.

During the decade 1880–89, Sauerbeck's table and mine show a remarkable coincidence. From 1880 to 1887 prices, according to Sauerbeck, fell 23 per cent.; while, according to my table, they fell 22 per cent. In both cases the fall was absolutely uninterrupted by any rise. In 1888 and 1889 a rise is indicated by both tables, 6 per cent. by Sauerbeck's, and 9 per cent. by mine—a rise due in New Zealand principally to agricultural and pastoral products, but in England to iron, wool, mutton, coal, sugar, and coffee.

From 1890–99 we find the tables again coincide, the movements being in the same direction in every year except 1896, when the New Zealand index rises, while the English continues to fall. It is worthy of note that prices touched their lowest in New Zealand in 1895; whereas this position was not reached in England till 1896. "The Economist," however, places it in 1895. It is also worthy of note that English prices at the beginning of the decade declined much more rapidly than New Zealand prices, remained stationary for a much longer period, and at the close

of the decade rose much more rapidly. There is nothing in the New Zealand tables comparable to the rapid rise in English prices in 1899. The New Zealand index advanced by about 1 per cent., while the English index advanced by more than 9½ per cent. This great rise, followed by one even greater in 1900, must be ascribed in great measure to the stimulus of the Boer War, which, affecting the price of coal, raised also the price of the minerals in the production of which coal is so important a factor. The placing of large Government contracts would also for a time tend to inflate prices. In 1900 the New Zealand index rose 3 per cent. As this rise was due principally to oils, minerals, and foodstuffs, and as the rise in England was largely due to the same articles, the bond of union between the two rising price-levels is most probably to be found in the commercial disturbance naturally created by the struggle in South Africa.

The year 1901 opened with reaction in both countries. The ill-success of the South African campaign, resulting in the Rand mines still remaining closed, probably caused a depression in national prices to go hand-in-hand with a depression in national spirits. Enterprise would naturally be restricted, causing English prices to fall heavily till 1903. New Zealand prices, being less inflated, suffered less, and recovered sooner. In 1904 English prices again showed an upward tendency, and continued to rise rapidly till 1907. New Zealand prices, however, fell abruptly in 1904, the fall being distributed over all the groups, with special severity in agricultural products, beef, bacon, and linseed-oil. The check, however, was merely temporary; the index rose from 95 in 1904, to 98 in 1905, to 101 in 1906, and to 107 in 1907. This last rise was accounted for mainly by the rise in agricultural products, beef and mutton, soap, linseed and castor oils, and iron. In 1907 both English and New Zealand prices stood at 7 per cent. above their level in 1900; but in 1908 both declined, English prices 8 per cent., and New Zealand prices 3 per cent. The fall continued in 1909, but was converted into a rise in 1910. The conclusion to be drawn appears to be that a period of rising prices began in 1896; that its even course was disturbed by the South African War; that a temporary check occurred in 1904; that prices again advanced with increasing rapidity till 1907, when excessive speculation caused a sudden restriction of credit, with consequent reduced prices. By 1910, however, prices were inflated rather than depressed.

Sauerbeck's Numbers Rearranged on Basis: Average Index Number 1890–99 = 100.

A difficulty in comparing the two tables arises from the fact that Sauerbeck has taken as his standard period the decade 1867–77, whereas I have chosen the decade 1890–99. As I explained above (Chapter V), it was inexpedient, even if not impossible, for

me to adopt Sauerbeck's standard. I have therefore converted Sauerbeck's index numbers into numbers based on my standard. Briefly, my method was to average Sauerbeck's numbers from 1890–99 inclusive, and to determine what percentage his numbers for the individual years bore to that average number. Thus, the average of his numbers from 1890–99 was 66. Now, Sauerbeck's index number for 1880 was 88. Calculating on my basis, and calling 66 = 100, 88 would therefore be the equivalent to 133. In a similar manner I have reduced all his numbers to numbers on my basis.

A Further Comparison of New Zealand and English Price-levels.

Table 2B serves two purposes of comparison. It enables one to see at a glance the nature of price-variations in both countries; and, in the second place, to see in what country the percentage of rise or fall has been the greater. This, I consider, is its most valuable purpose. We find, for instance, that in 1861 the English index number stood at 149, and the New Zealand number at 184. Now, it is only to be expected that the difficulty of transport, the lack of facilities of communication, the crudeness of the mechanism of production, distribution, and exchange, and the redistribution of a population rapidly increasing, owing to the discovery of rich goldfields, would keep prices at a higher level in New Zealand than in England. By 1871, however, we find the New Zealand and the English price-levels approximating each other, the New Zealand index number standing at 150 and the English at 152. In 1872 cable communication was established between Australia and England, and thus New Zealand was brought more closely into touch with the English commercial world.

Thence onwards the two numbers keep, with but few exceptions, remarkably close together. The most notable exceptions are in 1872, when the numbers diverge by 11; and in 1874 and 1883, when the numbers diverge by 6. In 1900 a divergence of 13 is evident, the English price-level rising by nearly 14 per cent., and the New Zealand level by about 2 per cent. In 1901, however, the two levels again approximated, the New Zealand level falling by 2 per cent., and the English level by 7 per cent. From 1870 to 1890 the average amount of divergence is about 3; while, if we omit the years of greatest divergence—*i.e.*, 1872, 1873, and 1883—the divergence is only 2. After 1899 the degree of divergence increases greatly. I have already explained the nature and probable causes of these divergences.

In the next chapter I shall review the price-movements in the light of the social and political changes which the Dominion has experienced.

CHAPTER IX.—THE NEW ZEALAND INDEX NUMBERS CRITICALLY EXAMINED.

Some Social and Political Changes (1860–80).

Means of Communication.

To descend into greater detail, and thereby give some explanation of the fluctuations in the New Zealand price-level, and, in addition, to account more fully for the divergence of the New Zealand from the English index numbers, it is necessary to take into consideration the social and political life of the community.

He that would account for the high prices of commodities in New Zealand in the "sixties" and the early "seventies," must bear in mind that New Zealand was then commercially, as well as geographically, isolated. She is so even now, but her isolation was then relatively increased by the scattered nature of her population; by the infrequency of her shipping services; by the lack of railway, telegraphic, and cable communication; and by the indifference, born of ignorance and nurtured by political sentiment, manifested by the United Kingdom to the requirements of her colonies. In 1861, a population under 100,000 was scattered over an area but little smaller than that of the United Kingdom. So inefficient were the means of communication that in 1857 letters from Auckland to Wellington were forwarded *via* Sydney, thus travelling 2,600 miles in order to reach a destination only 400 miles distant. Seven weeks were occupied in accomplishing that which is now done in eighteen hours! Communication with the world beyond Australia was even more infrequent. News arrived ten times a year from England, but was four months old when it arrived. Railways were unknown till 1863, and for some time were extended but slowly; the two main islands were not connected by cable till 1866; and, though Australia completed cable communcation with England in 1872, it was not till 1876 that New Zealand was linked with the system.

Gold-discoveries.

In addition to the causes affecting our relations with the external world we must take some account also of internal changes of great moment. In 1861 gold was discovered in Otago; the export of 18,000 oz. in 1860 rose to 753,000 oz. in 1861, to 1,591,000 oz. in 1862, and to 2,432,000 oz. in 1863. There was a fall in the output in 1864, but in 1865 the export rose almost to the level of 1863. In 1866 the goldfields on the west coast of the South Island were discovered, and the export that year reached 2,845,000 oz.

These discoveries produced something in the nature of a social revolution. The minds of the colonists were withdrawn from the monotonous, even if somewhat profitable, occupation of agriculture

by the more fascinating allurements of the gold-quest. In some provinces it produced a feeling akin to despair. The Government of Canterbury, which then was, and ever since has been, a purely agricultural and pastoral province, was induced to offer a reward for the discovery of a payable goldfield in the neighbourhood of its capital, Christchurch. The effort proved vain, but the gold-discoveries elsewhere continued. A great and sudden influx of population took place, and a rise in prices followed, till the supply of commodities could be accommodated to the demand. It is natural to expect that agricultural and pastoral products would experience the full force of the increased demand. The export of food products dwindled to insignificance. A reference to Table 4A will show how strongly they were affected. The rise is especially evident from 1863 to 1866. It took place in non-farm products also, though not nearly in the same degree.

From 1867 to 1870 the gold-production of New Zealand gradually declined, but rose rapidly in 1871, and maintained an average high level till 1874. Corresponding with this we find a decline in the index numbers till 1872, and, as agricultural and pastoral products were the most affected by the increase in the output of gold, so they were the most affected by its diminution.

The Public-works Policy.

I must now leave the question of gold-production to introduce another factor which made its presence felt in a remarkable degree during the "seventies," and to some extent ever since. In June, 1870, the Colonial Treasurer, Mr. (afterwards Sir) Julius Vogel, enunciated his famous public-works policy. The country was in the trough of a depression; it possessed only seven hundred miles of telegraph and forty-six miles of railway, the latter of no fewer than three gauges. It was without the conveniences of modern civilization; a long and exhausting war with the Maoris had caused the destruction of property of immense value, and paralyzed the industry and delayed the settlement of the North Island, while the heavy decline in the export of gold was convincing the colonists that they must look for commercial success to "the original and indestructible powers of the soil." From the fertile brain of Vogel was evolved an ambitious scheme of public works, necessitating the expenditure of ten millions of money in less than a decade. Parliament was fascinated by his superabundant optimism, by his vivid descriptions of "the leaps and bounds" which the colony would make socially and commercially did its inhabitants but have confidence in themselves.

They had confidence in Vogel. Millions of money were borrowed; hundreds of miles of railway were opened; roads and bridges innumerable made; and thousands of immigrants poured in. Forty thousand arrived in 1874, and thirty thousand in 1875.

Sale of Crown Lands.

Yet another factor must be introduced. The Government, acting upon the famous principle enunciated by Edward Gibbon Wakefield, that the Crown lands should be sold at "a uniform and sufficient price," threw millions of acres open for settlement at the price of £2 per acre. This principle was departed from for a time by Governor Sir George Grey, who, in 1853, lowered the price to 10s. an acre. The effect was little short of disastrous. Extensive tracts of land were purchased by "squatters" from Australia, and an almost irremovable barrier was thus raised against the future closer settlement of the country.

PRICE-MOVEMENTS, 1870–79.

I must now return to a further examination of the index numbers. In 1872 the index number rose suddenly, but a rise had taken place in England in 1871. The New Zealand rise was due principally to the high prices of agricultural products, minerals, and materials; while in the two following years, agricultural and pastoral products and materials were responsible for the continuance of the rise. The abrupt fall in 1875 was manifested over every group except pastoral products: this common fall was prolonged into 1876, but was again mitigated by the continued upward movement in pastoral products. A slight interruption of the fall was caused in 1877 by an abrupt rise in agricultural products, due most probably to two causes—the limited production in 1876 due to the low prices of 1875, and the rise in agricultural products in England in 1877. In 1878 and 1879 prices again declined rapidly. A rise in the index number took place in 1880, but it was synchronous with a sharp incline in agricultural products. It is worthy of note that the New Zealand gold-production, which had declined since 1874, suddenly shot upwards in 1877, declined rapidly in 1878 and 1879, and rose again in 1880. In 1876 and 1877, a rich goldfield was discovered on the west coast of the South Island — a region lacking both extensive areas of fertile land and those climatic conditions which are necessary for the successful development of the agricultural and pastoral industries. The sudden influx of population created a strong demand for food products, and this undoubtedly accounts in great measure for the high prices of those products during the closing years of the decade.

I have previously pointed out that the movements in the New Zealand and the English index numbers during the decade 1870–79 were, on the whole, in a similar direction. I shall point out in a later chapter (Chapter XII) how the non-farm products are more sensitive than farm products to movements in the English price-level.

FINANCIAL AND SOCIAL CONDITIONS, 1870–80.

I pass now to a brief description of the financial state of the country during the "seventies." I have said that the country was infected with the cheery optimism of Sir Julius Vogel. Roads and railways were opening up the country in all directions, and the high prices of agricultural and pastoral products caused an altogether disproportionate boom in agricultural and pastoral land. There was a feverish rush to buy, lest the opportunity should never return, and hundreds of thousands of acres were sold by the Government. Those who were already the fortunate possessors of stations and farms were enabled to disposed of them at highly inflated prices; while the local bodies, which received a share of the proceeds from the sale of Crown lands, vied with the Central Government in the expenditure of their easily acquired funds. Private borrowing to pay for this land raised interest to an exorbitant rate, and mortgagees made the fatal mistake of advancing too heavily on inflated values. When, therefore, wool and wheat —the great staple products of the country—fell heavily in price, and when to this were added a great decline in the production of gold and a sudden stoppage of public works, the land-boom burst.

In many districts the majority of the landholders were ruined; their properties were surrendered to the mortgagees, many of whom suffered the same fate, the principal one—the Bank of New Zealand —receiving so heavy a blow through the properties thrown back on its hands that in 1894 its manager warned the Colonial Treasurer, Mr. (now Sir) Joseph Ward, that, unless the Government came to the bank's assistance within a day or two, the country would suffer the worst crisis in its history. It is sufficient to remark that Parliament dropped all party feeling, and a Bill was rushed through, at a single sitting, on the eve of the day on which the bank had decided to close its doors.

THE DECADE 1880–89: A PERIOD OF GLOOM.

The decade 1880–89 was probably the gloomiest in the history of New Zealand. It was marked throughout by depression. Nearly twenty millions of debt had been added during the previous decade; the prices of agricultural and pastoral products continued to fall; and the decline in the production of gold is well illustrated by the fact that, though the annual output in the "eighties" was fairly stationary, it was in 1887 only 50 per cent. what it was in 1877. Industry stagnated; and the country, as pessimistic as it had formerly been optimistic, bitterly reproached Vogel and all his ways. In 1885 and 1886 the Government sought a way out of its financial embarrassment by retrenching the numbers and salaries of the Civil Service, and by the most rigid economy in administration. But with falling prices both in New Zealand and in Europe, not even the economy of the "Skinflint"

Administration, nor the establishment of public soup-kitchens, could prevent an exodus of ten thousand people from New Zealand. An appeal was actually made to the President of the United States of America for assistance to emigrate! From 1885–91 the excess of departures over arrivals was twenty thousand.

A Successful Experiment.

But in the very depth of this gloom the brilliant idea occurred of freezing meat for export to England. The trial shipment of 1882 was a success, and by 1890 the export was valued at over a million pounds. Richer by far than its gold resources were the pastures of New Zealand destined to be. Sheep proved to have a value beyond that of mere wool, and possible manure. In the same period the export of wool rose over 60 per cent. It was undoubtedly the success of the refrigerating process which enabled the country to tide over its greatest depression, and which has since done so much to raise it to its present prosperous position. It also made possible, and even necessary, the establishment of a fast steam service between New Zealand and England; and when the butter and cheese industries were put on a sound basis they found a fleet of modern steamers at their service.

The Decade 1890–99.

In 1889 a somewhat abrupt rise took place, agricultural and pastoral products being the most affected; but the rise was not maintained, and in 1893–4–5 the fall was very sharp, and affected every group. Here we probably were influenced by the Australian bank crisis of 1893–4–5. Prices touched their lowest in 1895; but, though there was somewhat of a financial crisis about this time, the era of the public soup-kitchen had passed away. The Government had successfully initiated the land-for-settlements scheme, the exports of wool and meat gradually increased, while the export of gold again began to advance rapidly. Towards the close of the decade the dairying industry revealed to the New Zealand farmer another hitherto neglected source of wealth. The Government fostered the industry, and in 1899 the export of butter rose 45 per cent. and in 1900 that of cheese 50 per cent. on the export of the previous year.

The Period 1900–8.

The present century, therefore, has been characterized by greatly increased exports of wool, meat, butter, and cheese; while the production of hemp and coal has also risen rapidly. In short, a total foreign trade of £18,000,000 in 1897 has given place to one of £39,000,000 in 1910. Land, as will be pointed out in a later chapter, has risen rapidly in price, and during 1906–7–8 boom prices were realized. The Arbitration Court was also very frequently invoked to raise wages. The old-age pension was raised

in 1905 from £18 to £26 per annum. Everything pointed to a period of greatly increased prosperity. With rising wages, and an alleged dearth of unskilled labour, there was, as in the "seventies," a demand for organized immigration, and during the past few years several thousands of immigrants have arrived in the Dominion. Towards the end of 1908 the financial stringency which affected America and Europe in 1907 and 1908 began to make its influence felt in New Zealand. The price-level fell, credit was restricted, and the rate of interest rose. For a time the "unemployed" difficulty was somewhat acute. A fairly large number left the Dominion, principally for Australia. The stringency now appears to be passing away, but, in view of the great amount of land recently sold at highly inflated values, the future is looked forward to with some apprehension.

One of the most striking features of these tables since 1898 has been the great discrepancy between the New Zealand and the English index numbers. I am inclined to think that the discrepancy can, in part, be explained by the nature of the items included in the two tables. The English tables contain a much higher percentage of raw materials than the New Zealand tables; and it is in raw materials that the New Zealand tables show the greatest rise.

Periodicity Observable in Price-movements.

In the preceding chapter I drew attention to a certain periodicity which appears to exist in New Zealand price-movements. The tables show high price-levels in 1864, 1873, 1880, 1889, 1900, and 1907; while relatively low price-levels occur in 1869, 1878, 1887, 1895, and 1904. The series of curves traced out by the fluctuations is certainly not a precisely uniform one; but they appear to indicate a period of approximately nine years during which prices sink from a relatively high position and rise again. It will be seen that the crest of any wave of prices is always lower than the crest of the preceding wave, with the single exception of the wave whose crest year is 1907.

New Zealand and English Index Numbers further compared.

In Table 3A I have averaged Sauerbeck's numbers over the decades, and this table shows those averages placed against the index number obtained for similar decade averages in New Zealand. From this table it will be seen that the English index numbers show fluctuations parallel with those of the New Zealand numbers. Down to the decade 1893–1902 there is no single instance where a decline in one country synchronized with a rise in the other. There are a few cases—*i.e.*, 1871–80, 1887–96, 1890–99—where a decline is apparent in the New Zealand numbers while the English

numbers remain stationary. But in all these cases the decline in the New Zealand numbers is very slight, never more than 2 per cent.—*i.e.*, 1871–80—and generally about 1 per cent.

Table 3B gives the English and New Zealand numbers averaged for the decades as in the previous table; but in this table Sauerbeck's numbers have been rearranged on the basis: average of the yearly index number for the period 1890–99 = 100. The result is instructive. It shows how similar have been the movements in the New Zealand and the English price-levels. The first few decades, it is true, show considerable divergence; but thence onwards the numbers fluctuate with remarkable uniformity. Over this whole table there is no single instance where a movement in the one direction in New Zealand is not matched by a movement in the same direction in England. This table also reveals the peculiar fact that down to the decade 1893–1902 both New Zealand and English prices averaged over the decades have suffered a heavy and absolutely continuous decline. The New Zealand and English numbers for twenty-five decades, from the decade 1870–79, coincided exactly in seven cases; they deviated by 1 in fifteen cases, and by 2 in three cases; but in no case was the deviation greater than two.

Yet another striking peculiarity is indicated by this table. Down to the decade 1870–79 the English index numbers for the decade were always lower than the corresponding New Zealand numbers; from that time till the decade 1883–92, when they again coincided, the English numbers, wherever they diverged from the New Zealand numbers, were always higher; till they once more coincided in the decade 1890–99 they were always lower; and since then they have always been higher. The amount by which they deviated was, as previously pointed out, very slight; yet the peculiar nature of the deviation is such as to attract attention.

CHAPTER X.—THE USE OF THE MEDIAN.

Some Defects of the Arithmetic Average.

In all the preceding comparisons my calculations have been based on the arithmetic mean. It has been well objected that this method gives too much importance to extreme variations in individual articles. An exceptional rise or fall unduly affects the index number of the particular year, more especially if that article is not one of prime importance; and this evil is intensified the fewer in number the articles in the standard. It is true, however, that an exceptional fluctuation in one or two articles does not affect the average to any appreciable extent when a large number of articles is included. It is equally true that an exceptional rise

in one commodity, or in a group of commodities, is often synchronous with an exceptional fall in another commodity or group of commodities; and these opposite variations often to a great extent cancel each other. This is probably the reason why the average given by the arithmetic mean does not, as a rule, vary much from the average given by various other methods, the use of which has been proposed.

Causes of Exceptional Fluctuations in Prices.

Owing to the geographical isolation of the country, the lack of facilities of communication, the undiversified nature of the industries, and to the exceptional variations in demand and supply due chiefly to the gold-discoveries, it is evident that prices during the "sixties" and early "seventies" must at times have been subject to exceptional fluctuations. It is, indeed, common to read in the commercial reports of those days of prolonged periods of scarcity of certain imported articles. Scarcity at times also affects the price of commodities of local production. Where it has been customary to export an article it is difficult to create an import trade to supply the commodity in times of local scarcity. More especially is this the case when the local scarcity has been unforeseen. This is often the case where cereals are concerned. The methods at present adopted for ascertaining the amount of cereals in the country are so crude that but little reliance can be placed upon the results derived from them. The method formerly adopted was to ascertain the acreage under crop, and the owner's estimate of its probable yield. But as these statistics were compiled at a time anywhere within three months from the harvesting of the crop, an unfavourable summer might easily ruin the fair promise of the spring. Even if it did not, farmers are prone to exaggerate the productive capabilities of their soil. An attempt has recently been made to compile agricultural statistics in the autumn following the harvest referred to. On the whole, therefore, the estimates of cereals are rather unreliable, the result being that merchants, millers, and producers are sometimes caught napping, and a serious rise or fall is the consequence.

Serious fluctuations may also arise when the stocks of imported commodities run low. This was often the case when shipping-communication was much less regular than now, and when the commercial community in New Zealand was not very highly organized. Till 1872 even Australia was without cable communication with England, and New Zealand was denied this advantage till 1876. More regular communication, both colonial and external—the railway, the steamer, the telegraph and the cable—the growth of population, and the holding of larger stocks have all combined to eliminate fluctuations arising from this source.

Fluctuations in price often occur in the case of articles in which no export trade is done. The local market is apt to be at

times "glutted," at others bare. This was the case with the market for animal products, especially food products, before the commercial application of the refrigerating process.

In order to see how my index numbers would be affected by the adoption of another method, I have calculated the index number by adopting the principle of the median (Chapter V). This method undoubtedly eliminates that error (if it can be so called) which arises from the occurrence of exceptional fluctuations in the prices of individual articles. In Table 2B I have arranged in parallel columns various index numbers. Column 1 shows my index numbers calculated by the arithmetic mean; column 4 shows the same numbers calculated according to the principle of the median; and in column 3 are Sauerbeck's numbers calculated on the basis: average index number, 1890–99 = 100.

A general review of this table shows a marked similarity in the movements of columns 1 and 3. The fluctuations in both columns are parallel—*i.e.*, a rise or fall in both is synchronous. The index numbers are fairly even in both columns, and particularly so since 1872, the numbers in column 4—those calculated by the median—being on the whole slightly lower than those in column 1, thus indicating that the exceptional variations have been of the nature of a rise more often than of a fall.

Prior to 1872 the variation of column 4 from column 1 is much more pronounced.

Whenever a variation occurs it is found that column 4 is almost invariably lower than column 1, thus proving that the rise in a minority of articles more than compensated for the fall in the others. Where the median is much below the arithmetic mean, some of the numbers above the median must have been exceptionally large. This is especially evident in the years 1862, 1863, 1866, and 1871, and these, as previously pointed out, were years of abnormal trade conditions. The approximation of the median to arithmetic mean since the middle of the decade 1870–79 must be ascribed to the steadying influence exerted on prices by the growth of population, the development of the country, the establishment of cable communication with England, and the growth in amount and regularity of the shipping.

In 1870 the index number in column 4 shows a defect which is peculiar to the median. The index numbers representing individual prices are not grouped closely around any central number, but lie between the two extremes 141–155. When the median lies between two numbers close together, it is logical to place it midway between those two numbers, but when those two extremes differ by fourteen, it is problematical whether the truth is approximated by placing it in the medial position.

In the majority of cases the numbers in column 4 do not approach so closely to the figures in column 3 (Sauerbeck's) as do those in column 1. As, however, the effect of the median is

principally to reduce the influence of exceptional fluctuations, we find that in the "sixties" and early "seventies" the median is closer to the English than to the New Zealand index numbers.

Decade Averages.

But the operation of a general law, though obscured by the fluctuations of individual years, can often be made more apparent by taking averages over a long period. Table 3A gives the decade averages, and in parallel columns I have placed the decade averages obtained by other methods. Between the first and the fourth columns there is a very marked similarity. Both exhibit a continuous decline from the first decade till the decade 1896–1905. It will be observed that the decline in both columns is of a remarkably even nature, especially when we consider the number of decades over which it is computed. Thereafter there is a parallel rise in both columns.

CHAPTER XI.—INDEX NUMBERS OF COMMODITIES BY OTHER METHODS.

In this chapter I outline two methods by which I sought to test and confirm in general form the results obtained by the method of index numbers based on the prices of individual commodities. The results of the methods themselves will be found in Tables 5 and 6.

Index Numbers based on Trade and Shipping.

Table 5 shows a system of index numbers based on the growth of New Zealand's foreign trade. This trade I have taken as equivalent to the aggregate value of our exports and imports. I have taken the figures from the "New Zealand Official Year-book." A considerable degree of care is expended in order to ensure their accuracy; but there are faults inherent in the system which compel one to regard these statistics as only approximately correct.

I have estimated the volume of trade in terms of tons of shipping. I have taken the aggregate tonnage of the shipping entering and leaving New Zealand every year. These statistics are taken from the New Zealand Year-book, and, being a matter of the simplest calculation, may therefore be regarded as very approximately correct. No account whatever is taken of the fact that ships are seldom carrying their full complement of cargo. Ships may even arrive in ballast, yet their tonnage is included in the annual aggregate of tonnage entering. In the "Statistics of New Zealand" the shipping is classified as "Ships arriving or departing with cargoes" and "Ships entering or leaving in ballast." These figures indicate what one would expect to find in a newly settled country—*i.e.*, that the percentage of ships arriving

or leaving in ballast was greatest in the "early days," and has shown a tendency towards a continuous decrease. More especially would this be so during a period of brisk immigration. Thus we find that the amount of shipping in ballast was 25 per cent. of the whole during the decade 1860–69; 17·5 per cent. of the whole during the decade 1870–79; 8 per cent. for the decade 1880–89; and 6·5 per cent. for the decade 1890–99; but 9 per cent. for the period 1900–8. The statistics, however, do not tell us what percentage of their full complement the cargo-ships really carried. It is safe, however, to assume that many, if not the majority, of the ships arrived and departed without their full complement of cargo; but on this point it is futile to speculate. As this table is merely for the purpose of general corroboration, I have included in column 1 the total value of the foreign trade, and in column 2 the total volume of shipping, without making any allowance for ships arriving or leaving in ballast, or without their full complement of cargo.

How the Index Number was obtained.

I have reduced the value of trade and tonnage to index numbers which represent the percentages which the trade or tonnage of any individual year bears to the average annual trade or tonnage of the decade 1890–99. Then by dividing the index number of trade by the index number of shipping, and multiplying the quotient by 100, I have obtained the index number of prices for the year.

Results of the Table.

It follows of necessity that index numbers obtained by this method can be only roughly approximate. Still, they afford valuable evidence corroborative of the results obtained by other methods. A comparison of the results obtained by this method with the results obtained by the ordinary method of index numbers (Table 1) shows some striking resemblances. In the first place, we note in both tables a marked decline, not quite uninterrupted throughout. In Table 5 the index numbers for the "sixties" and "seventies" are considerably lower than the corresponding numbers in Table 1. This may be due to errors in calculating the value of imports and exports; but the more probable explanation is that the volume of shipping is reckoned far too high. From 1880 onwards the percentage of shipping in ballast is very small compared with the amount prior to that period, and from that date, too, the movements of the index numbers in both tables are similar in direction and approximately equal in amount. We can then say that any very marked discrepancy between the figures of the two tables is due to errors in overestimating the amount of tonnage, thus giving too low an index number. This hypothesis appears to be verified by certain strong cases. It would, for instance, be natural

to expect a heavy fall in the index number whenever the percentage of shipping in ballast was unusually high. Now, this is just what we find. In 1864 and 1865 the percentage of shipping in ballast shows a great increase. The index numbers for those years show a decline in no way equalled by the decline in the numbers obtained by the ordinary method. In 1879 there is another great increase in ballast shipping, and coincident with this is a great fall in the index number. The discrepancy in the numbers for 1880 is probably due to the fact that 1880 was a period of very depressed trade, involving the arrival and departure of ships without full complements of cargo. In 1890, 1901, and 1908 ballast shipping suddenly increases and the index numbers fall. When, however, the percentage of shipping in ballast remains fairly stationary, then the index numbers obtained by the two methods move in the same direction and by fairly even increments. This is the case in 1876, 1877, and 1878.

In both tables the decline culminates in 1895, and is there inverted into a rise.

On the whole, we note that movements in the one table have roughly synchronized with parallel movements in the other. Some of these parallel synchronous movements are of importance as tending to establish the accuracy of the results obtained by the method adopted in Table 1. Thus both tables show an unexpected rise in 1866, 1872, 1873, 1877, 1889, 1891, 1896, 1905, 1906, and 1907. The most abrupt rises are those of 1893 and 1907. These movements synchronize for the most part with movements in Sauerbeck's numbers, particularly in the years 1872, 1873, 1900, 1906, and 1907.

But the results of Table 5 diverge in a few cases from those of Table 1. The most pronounced instances are 1868, 1869, 1880, 1882, 1888, and 1908. The abrupt rise in 1900 in Table 5 is evidently due to the comparatively full cargoes carried that year. Thus, when we compare the shipping and trade in 1895 and 1900 we find the volume of shipping to have been practically stationary, while the volume of trade increased by about 16 per cent. As the imports and exports in both years were essentially of the same nature, and prices but slightly higher, this can mean only that ships carried fuller cargoes in 1900 than in 1899.

General Conclusions.

Table 5 shows that from the index numbers computed on the volume of trade and shipping there have been obtained results essentially similar to those obtained from numbers computed by the ordinary method of index numbers. When I consider the crude nature of the material at my disposal in the matter of volume of trade and shipping, I am surprised at the coincidence. It is true that the results do not agree with the results of Table 1 in every detail; yet I think that

I am guilty of no error of induction in paying attention to those points in which the two tables agree, and ignoring, to some extent, those points in which they differ. The reliability of the data is in question; the degree of reliability varies from year to year; the phenomena of one year are not always the results of phenomena of preceding years. Where, therefore, I find the results of the two tables agreeing in the majority of instances, where an unexpected rise or fall is synchronous in both tables, and where the degree of rise or fall is approximately equal in both, I feel little diffidence in accepting the results of the one as corroborative of those of the other, being prepared to believe that any discrepancy observable would diminish as the accuracy of the data increased. And, as I said above, whenever discrepancies occur doubt must be cast on the results obtained by the method based on trade and shipping.

Index Numbers based on Trade and Population.

Table 6 gives an index number compiled on an altogether different basis. Column 1 is an index number representing the population, on the basis: average annual population of the decade 1890–99 = 100; and column 2 an index number indicating the volume of our annual foreign trade calculated on a similar basis. Dividing column 2 by column 1 and multiplying the quotient by 100, we get an index number representing the value of the trade per head. Now, providing our data of population and trade be correct, this number ought to be a fairly reliable index of the depreciation and appreciation of gold. But this conclusion involves the assumption that the volume (not value) of trade per head has remained stationary. I shall allude to this feature later on.

Examination of the Results.

A comparison of this table with Table 1 reveals some striking resemblances. In the first place, a long-continued fall is shown by both tables. In both tables that fall reaches its lowest in 1895 (this minimum is also obtained by Table 5), and an irregular but interrupted rise follows. Both tables show exceptionally high index numbers in the "sixties," the fall in 1871, and the inflated prices of 1872 and 1873. In 1880 and 1881 the numbers diverge violently, these being years of depressed foreign trade. The rapid decline in the "eighties," and in particular the fall in 1887, are well marked, so also is the sudden rise in 1889. The movement in the "nineties" is, on the whole, similar in both tables, but since 1899 the rise in Table 6 has been much more rapid than the rise in Table 1. The abrupt rise in 1906 and 1907 and the fall in 1908 are well marked in both tables. These fluctuations are similarly well marked in Table 5, a table based on trade and tonnage.

I lay little stress on this table as an accurate index number of prices, though taken in conjunction with the results obtained from the table of trade and shipping, it increases the probability that the course of prices has been that indicated by Table 1. The discrepancies between its results and those of Table 1 are for the greater part due to the varying amount in volume (not in value) of trade per head.

Some Further Deductions.

If we could assume that the index numbers of prices obtained by the method of Table 1 be correct, and that the statistics of total trade and population in Table 6 be likewise correct, then from the index numbers of both tables we could deduce with fair approximation the increase or decrease in the volume (not the value) of trade per head as compared with the volume for the standard period. Thus, the index number for the year 1906 being by Table 1 = 101, and by Table 6 = 151, we could say that the volume of trade per head in 1906 was to the volume during the standard period 1890–99 in the ratio of 151 : 101; or, in other words, that the volume of trade per head had increased by 50 per cent.

Similar calculations show that the volume of trade per head has been above the standard ever since 1897. Previous to that time it was not above the standard later than 1875, with the exception of 1878, when it was 3 per cent. above. In 1880, however, it was 18 per cent., and in 1881 14 per cent., below the standard. In 1885 it was 9 per cent. below, and during 1886–7–8 it was 14 per cent. below the standard. In the period of inflated prices, 1873–4–5, it was slightly above the standard. Never, however, did the volume of trade prior to 1875 approach the volume per head during this century.

These deductions further establish the fact of an inflation in the "mid-seventies," of a crisis about 1880, of a great depression between 1880 and 1889, and of a great increase of prosperity since 1897. The conclusions reached by this method are essentially the same as those reached through an examination of the bankruptcy, marriage, and discount rates.

CHAPTER XII.—FARM AND NON-FARM PRODUCTS COMPARED.

As New Zealand is pre-eminently an agricultural and pastoral country, its prosperity depends chiefly upon the price of the products of the soil, and especially of those products the circumstances of whose production leave a large surplus available for export. High prices for commodities of local production with no considerable surplus for export merely transfer wealth from one portion of the community to another, and thus do not benefit the country socially, except in so far as such transference is from a class where the marginal utility of wealth is low to one where it is relatively high.

In Table 4A the variations in the price-level of farm and non-farm products are shown. This division corresponds roughly with that of raw materials and finished products, but more approximately with imports and exports. Column 1 gives the annual index number for farm products, and column 2 that for non-farm products; while column 3 gives the index number for all New Zealand, and column 4 Sauerbeck's index number (on the basis of 1890–99 = 100) for all English commodities.

These numbers show that down to 1864 there was on the whole a rise in both classes of commodities—a rise apparently due to important gold-discoveries which caused a large influx of population and a very strong demand for commodities. From 1864 to 1871 prices declined, the decline being more serious in farm than in non-farm products—viz., 44 per cent., as against 15 per cent. With but few exceptions the fall was a continuous one. The most notable exception was in 1866, when both classes of commodities made a temporary advance. Not only was there a crisis in Europe that year, but the gold-production of New Zealand was exceptionally large.

The intensity of the fall in farm products compared with that in non-farm products shows that the agricultural and pastoral resources were being rapidly developed. The statistical returns of 1872 show that since 1864 population had increased by 55 per cent., sheep by 100 per cent., and cattle by 90 per cent., while the export of wheat had risen from 4,000 to 1,030,000 bushels. As the non-farm products were mostly imported products, and therefore produced in a place where the conditions of production were comparatively stable, it was not to be expected that they should exhibit so serious a decline in prices as that manifested by farm products.

During 1873 and 1874 farm products were greatly inflated; so also were non-farm products in 1872–3–4. A closer examination shows that farm products had commenced to rise in 1872, but as early as 1871 more than half the non-farm products had risen.

The latter rise is quite in accordance with the rise in the English price-level of that year. The fall in non-farm products in 1874 taking place at the same time as the fall in the English price-level, though a year before the fall in farm products, proves the dependence of the prices of non-farm products in New Zealand upon the prices of commodities in England.

By 1875 farm products had begun to decline, and henceforward declined along with non-farm products. In both classes of commodities the decline was constant, any rise being of the briefest duration, prices in the year following the rise falling below the level of the year preceding the rise. The remarkable rise of farm products in 1877 was caused entirely by the rise in cereals, and this was due in part to a great increase in the production of gold, but mainly to the largely increased production of cereals in the preceding year. An examination of the wheat table (Table 8) shows that in 1876 there was a remarkable decrease in the production of wheat, coupled with an equally remarkable rise in the yield per acre. This would imply that cereals were being neglected except on the higher class lands. This neglect must be ascribed to two causes—the low prices of cereals, especially barley and oats in 1875, and the exceptionally high price of wool in 1872–3–4–6. From 1873 to 1875 the export of wool rose 30 per cent. In 1880 the English price-level rises abruptly, and so does the level of non-farm products. The majority of farm products rose in 1882, but declined rapidly afterwards. In 1889 a rise in wheat, oats, wool, mutton, and cheese again forced up the level. Non-farm products rose also in response to a rise in England.

The decline in farm products was continued in the "nineties," culminating in 1895 in the record low level of 91. Thenceforward a rise is apparent, especially in the new century. The decline in non-farm products also continues, reaching in 1895 the record low level of 95, but destined to fall still lower in the next century. The level fluctuates, and is apparently quite under the domination of the English price-level. This is especially apparent in 1900 and 1901, and shows that the South African War seriously affected the price-level of our imports, and in 1906 and 1907, when the rapid rise in English prices coincided with an equally rapid appreciation in the price of non-farm products.

These observations lead naturally to the conclusion that the variations in the English index number correspond more closely to the variations in the non-farm products than in the farm products of the New Zealand table; with the sole and slight exceptions of 1863 and 1877, a movement in the one direction in the English table synchronizes with a movement in a similar direction in non-farm products. Still, the movement is roughly similar in column 1 and column 4. It is, on the whole, downwards till towards the end of the century, when a tendency towards a rise is apparent in both columns.

Some Peculiarities in Movement, and a Suggested Explanation.

Columns 2 and 4 present a peculiarity which may be more than merely fortuitous. From 1861 to 1875 (with the exception of 1872 and 1873) the English index number is invariably below the New Zealand index number for non-farm products; from 1876 to 1883 it is always equal to or above; from 1884 to 1898 it is invariably below; while from 1899 onwards it is again invariably above. This, of course, does not imply that the actual English prices were higher or lower than New Zealand prices. It merely implies a greater degree of rise or fall in the English price-level than in the New Zealand price-level. Whether individual English prices were actually higher or lower than individual New Zealand prices would depend upon the ratio in which the standard prices—*i.e.*, the average annual prices during the decade 1890–9—of those commodities in England stood to the standard prices of the same commodities in New Zealand.

A similar peculiarity is presented by columns 1 and 4. Though the price-level of non-farm products is more sensitive to change in the English price-level than is the level of non-farm products, yet the price-level of New Zealand farm products rises above, or sinks below, the level of New Zealand non-farm products with an alternation strikingly similar in time to that observed in the preceding paragraph. Thus from 1868–73 the index numbers of farm products are below those of non-farm products; from 1874–83 they are above that level; from 1884–95 they are below; and since 1895 they have been invariably above.

Now, when we consider the remarkably even nature of the fall in non-farm commodities, and the fact that the majority of the English commodities are, like farm products, raw materials, I think we may fairly conclude that this strange similarity in movement of the price-level of farm products and English commodities on the one hand and of non-farm commodities on the other, is due to causes affecting the production of raw materials. Climatic and other phenomena would cause the conditions of production of raw materials to vary much more than the conditions of production of non-farm products or manufactured goods. The conditions of production of the latter would be comparatively stable; the decline in their price as exhibited by Tables 4A and 4B is almost majestic in its regularity.

A graphical representation of these is presented in Diagram No. 2.

Farm and Non-farm Commodities averaged over the Decades.

In Table 4B the index numbers for farm and non-farm products are shown as averaged over the decades. Here the general trend of the price-level is more easily seen, as the temporary fluctuations of exceptional years are subdued in the average over a term. The table is most emphatic in showing the course of prices. Since the

decade 1861–70 to the decade 1892–1901 there was an absolutely continuous decline in the prices of commodities in both columns. Since the decade 1892–1901 there has been a continuous rise in farm products, but the fall in non-farm products hase been quite uninterrupted and remarkably even. There are indications, however, that the decline in the latter is being checked. Column 3, which gives the index numbers for all commodities, moves in sympathy with the numbers in the other columns. Down to the decade 1896–1905 column 3 falls uninterruptedly. Under the influence, however, of the steadily rising values of column 1, and the stationary values of column 2, a slight rise is henceforward discernible in column 3.

General Conclusions.

We may therefore conclude that, in a new country possessed of great agricultural and pastoral resources, and remote from great industrial centres, farm products fall at first much faster than non-farm products, owing to the comparatively rapid development of rural industries. It also appears that the relatively high prices of farm products between 1873 and 1877 accounted in great degree for the land-boom of the "seventies"; while the rapid and continuous decline in the same products in the "eighties," and especially between 1884 and 1888, must be held chiefly responsible for the intense social distress of that time.

Though farm products were lower in the "nineties" than in the "eighties," the social and financial state of the country had improved, for farm products in the aggregate had greatly increased, owing to the development of the frozen meat, butter, and cheese industries, and the finances of the farmer had at length become adjusted to the new price-level. During this period the Government initiated two policies of the highest importance to the farming community: the subdivision of large estates for closer settlement, and the granting of loans at low rates of interest to settlers. During the present century the price-level of farm products has risen rapidly, while that of other products, wherever it has not fallen, has remained practically stationary. It is too early, however, to estimate what has been the actual effect of these various factors upon the prosperity of the farming community. While it is undoubtedly true that cheap money freed many a farmer from an incubus of debt, and that rising prices infused a new life into the farming community, it is equally certain that many a settler has paid an additional price for his land merely because he was enabled to borrow money at a low rate of interest. And it is equally true that while rising prices for produce have made farming more attractive, they have also raised the price of land. Taxable values, too, have rapidly increased. It is, of course, true that large profits, principally in the form of unearned increment, have been made by the selling of land in recent years; but what is of real importance is the answer to the question: What is the condi-

tion of the present occupiers of the land, especially of those who bought their holdings within the past few years?

As the prosperity of the cities is in New Zealand so intimately associated with the prosperity of the rural industries, the values of urban lands also have greatly appreciated. Hand-in-hand with this has arisen a speculation in urban land-values, and, as an alleged countercheck, the adoption in many centres of the system of rating on unimproved values.

In Chapter XIII I have discussed in detail the effects of variations in the price of farm and non-farm products on the marriage-rate.

The subsequent chapter will be devoted to an examination of the connection between the bankruptcy-rate and the price-level of commodities, and especially of farm commodities.

CHAPTER XIII.—THE PRICE-LEVEL AND THE MARRIAGE-RATE.

Index Number of Prices and Marriages compared.

It is a well-known fact that the marriage-rate fluctuates with the changes in the prosperity of a country. Other things being equal—*e.g.*, the proportion of people of marrying age and the ratio of the sexes remaining constant—the marriage-rate will rise as prosperity increases, and fall as it declines. It may therefore serve as a useful indicator of the social condition of a country.

In Table 7 I have included a column giving the marriage-rate indicated by an index number based on the standard: annual average number of marriages per thousand of population during the decade 1890–99 = 100.

In comparing these numbers with the index number of prices, we find a striking similarity in movement. There is in both an upward movement in the early "sixties," followed by a decline till the early "seventies." The rise in the price-level in the middle of the "seventies" has its analogue in the rise of the marriage-rate. Thence both levels decline, till the middle of the "nineties," a rise then occurring and continuing till 1907. In reading Table 7, however, it should be borne in mind that the marriage-rate was also probably affected by changes in the ratio of the sexes. In the pioneer days of a State the men generally predominate largely, all the marriageable women readily securing husbands. Families are also probably relatively few and small. This would give a higher ratio of marriageable persons, and consequently a relatively high marriage-rate.

Examining the two levels in greater detail, we note that the high price-levels of 1864–5–6 forced up the marriage-rate, and that the falling levels of 1869–71 depressed it. The marriage-rate fell heavily in 1872, in spite of a slight rise in prices, but the continued prosperity of 1873–4 caused it to rise abruptly in 1873–4–5. The fall in the price-level of 1875 and 1876 was accompanied by a fall in the marriage-rate in 1876 and 1877. From this it would appear that, if the inflation or depression is slightly prolonged, a rise in the marriage-rate lags a year behind a rise, and a fall a year behind a fall, in the price-level. Apparently the spirits of a minority of those who contemplate matrimony are as easily depressed as they are elated.

The effects of the bursting of the land-boom in 1879 and 1880 are vividly portrayed by the sharp fall in the marriage-rate; so, too, is the gloom and depression of the "eighties." Retrenchment schemes and "soup-kitchen" policies do not induce a high marriage-rate, according to the tale told by the index numbers for 1886–89. But hope of marriage springs eternal in the human breast, and the rather abrupt rise in prices in 1889, 1890, and 1891 is attended by a rise of the marriage-rate in 1890–1–2. When in 1895 the price-level touched its lowest, so, too, did the marriage-rate. From that time the marriage-rate rises coincidently with, but much faster than, the price-level. A long-continued period of prosperity seems to encourage enterprise; the marriage-rate becomes much more sensitive, and responds more immediately to changes in the price-level. A slightly abrupt rise in prices—*e.g.*, in 1900, 1906, and 1907—sends up the rate immediately; while a temporary fall—*e.g.*, in 1901, 1904, and 1908—causes merely a retardation or cessation of the upward movement.

Farm Products and the Marriage-rate.

If we compare the index number of the marriage-rate with the index numbers of farm and non-farm commodities, we find that, on the whole, the fluctuations in the marriage-rate correspond more closely with variations in the prices of farm products than with those in non-farm products. In a country the chief wealth of which lies in its cornfields and pastures, this must of necessity be so. Attention is directed in particular to the abrupt rise in farm products in 1863, 1873, 1874, 1877, 1882, 1889, 1896, 1902, and 1905, and almost equally abrupt rise in the marriage-rate in 1864, 1874, 1875, 1878, 1882, 1890, 1896, 1903, and 1906. On the other hand, low prices for farm products, especially in 1870, 1871, 1876, 1884, 1889, 1895, and 1909, all involved in a sharp decline in the marriage-rate in 1871, 1872, 1877, 1885, 1889, 1895, and 1909; while the fall in prices in 1901 would probably have caused a fall in the marriage-rate of 1902 but for the exceptional rise in prices in the latter year. It at least checked the rate of increase. The fall in prices in 1904 keeps the marriage-rate of 1905 at the level of the previous year. This uniformity of the effects of high and low prices for farm products is truly remarkable.

Conclusion.

Thus the marriage-rate appears a most faithful barometer of commercial prosperity. It indicates more clearly than the price-level the decline or the fall in the prosperity of the nation. It shows in a most convincing manner the cumulative effects of a long period of falling prices, and illustrates even more effectively the cumulative results of a long period of slowly rising prices. The stagnation of 1870–72, the agrarian crisis of 1879–81, and the bitterness of 1886–89 are eloquently proclaimed; equally so are the gold-discoveries of the "sixties," the land-boom of the "seventies," and the extravagant land-speculation of the last few years. It is to be hoped that the farming community will not again have to drink of the bitter waters of agricultural depression. The danger is imminent. Fortunately, however, the products of the soil are much more diversified than they were in 1880—the eggs are in more baskets. In this is the sheet-anchor of the agricultural community, and virtually of the whole Dominion.

CHAPTER XIV.—THE PRICE-LEVEL AND THE BANKRUPTCY-RATE.

Index Numbers of Prices and Bankruptcies compared.

As the bankruptcy-rate is a very fair indicator of the social and financial condition of a country, I have compiled a table (Table 7) to show the correspondence that exists between the bankruptcy-rate and the price-level of farm commodities. I have expressed the yearly bankruptcy-rate as an index number, basing it upon the standard: annual average bankruptcy-rate per thousand of population for the decade 1890–99 = 100. Included in the table are the index numbers for all commodities, and separate index number for farm commodities.

The connection, as might naturally be anticipated in a country whose resources are principally those of soil and climate, is a most intimate one. The rapid fall in farm products in 1864–65—I have been unable to obtain statistics of bankruptcies prior to 1866—was followed by a high bankruptcy-rate in 1866–67; while a similar fall in 1868–69 had the same effect. The great rise in farm products in 1872–3–4 was no doubt the cause of a correspondingly great reduction in the bankruptcy-rate; whereas the abrupt fall in prices in 1875 synchronized with an equally abrupt rise in the rate. The very high bankruptcy-rate during the period 1877–83 marked the effects prior to and after the bursting of the land-boom—a process hastened by the great and almost continuous decline in farm products. The rate of bankruptcy declined abruptly in 1883; we may presume that the crisis had passed and that the rural industries were being successfully readjusted on the basis of lower prices. The rate rose again in 1884–5–6, because of a further decline in prices. The high prices of 1889 reduced the rate considerably, and after that the rate declined, owing, most probably, to a fairly steady price-level, coupled with an increased production. The year 1894 shows a drop in the price-level, especially of wool, mutton, and wheat, and a consequent abrupt rise in the bankruptcy-rate. From that year onwards the bankruptcy-rate falls gradually in response to an almost continuous rise in farm products.

The Influence of the Dairying Industry.

The fall is most abrupt from 1899 onwards. In 1900 the bankruptcy-rate fell 20 per cent. on an already steadily declining rate, while next year it fell 30 per cent. on the rate of 1900. Now, in 1899 the export of butter rose 40 per cent., and in 1900 the export of cheese rose nearly 50 per cent. By 1910 the export of butter had risen in value by nearly 370 per cent. on the export of 1899; and the export of cheese by nearly 500 per cent. on the values of 1900. We must regard the rapid development of the dairying industry as one of the greatest factors in promoting that increased commercial stability and social prosperity so forcibly proclaimed by the vanishing bankruptcy-rate. There is probably no rural industry of such magnitude wherein the benefits are so widely distributed, and where the total utility of the increased national wealth, therefore, is, on the whole, so great.

It is unfortunate that the extremely rapid development of this industry has brought the evils of land-speculation in its train. It is somewhat difficult to trace the genesis of a land-boom; but whatever its origin, there seems no doubt that this boom was fed by the increasing streams of wealth from the rapidly expanding dairy industry. Land once devoted to cereals has been appropriated by this industry, and, in consequence of increased returns, has rapidly risen in price. The boom, increased by good prices for wool and meat, spread to lower-grade pastoral lands, and then to urban sites. Like the boom of the "seventies," there were many good reasons for its origin, but few for the dimensions to which it attained. It is to this, no doubt, that we must ascribe the abrupt rise in the bankruptcy-rate since 1904. In my opinion, indications point to a further rise in the bankruptcy-rate in the immediate future. Much will depend upon whether our staple commodities maintain in the English markets their high price-level of the past few years.

The Bankruptcy-rate and the Marriage-rate.

We may therefore conclude that the bankruptcy-rate, like the marriage-rate, is intimately dependent upon the price of farm products, particularly of those which are exported in considerable

quantities. Wool and meat were the most important of these before 1890, but since that time wheat has yielded place to meat and dairy-produce. The bankruptcy-rate also joins with the marriage-rate in reminding us of the social depression in the years around 1870, of the national and commercial buoyancy of the "mid-seventies," and of the ruin which overtook the country on the bursting of the first great land-boom. Equally well do both show the stagnation of the "eighties," and the growing hope and enterprise of the "nineties." The effect is most strikingly marked after 1895, the bankruptcy-rate falling and the marriage-rate rising in such a manner as to indicate that the past ten years, with their rising price-level and increased volume of exports have been, on the whole, a period of social happiness and commercial stability unparalleled in the history of the Dominion.

CHAPTER XV.—FLUCTUATIONS IN THE RATE OF DISCOUNT IN NEW ZEALAND.

THROUGH the courtesy of the manager of the Bank of New Zealand, I am enabled to quote the following rates of discount which prevailed in New Zealand since 1875. The Bank of New Zealand was incorporated in 1861, but in his letter the manager of the Christchurch branch says, "We are advised by our Head Office that they can find no records to furnish information prior to 1875."

The following is the table :—

Date.	Fluctuation Per Cent.	Date.	Fluctuation Per Cent.
1875. May ..	8–9	1884. January..	7½–8½
July ..	7–9	September	6½–9
1876. January..	7–9	1885. January..	6½–9
1877. January..	7–9	June ..	6½–7½
1878. January..	7–9	1886. January..	6–7½
1879. January..	7–9	June ..	6½–8½
March ..	8–10	July ..	7–9
1880. January..	8–10	1887. January..	7–9
1881. February	7–10	September	7–8
1882. January..	7–10	1888. January..	7–8
March ..	6–8	1889. January..	7–8
August ..	7–10	1890. January..	7–8
September	7½–8	1891. January..	7–8
1883. January..	7½–8	1892. January..	7–8
May ..	7½–8½	1893. January..	7–9

Date.	Fluctuation Per Cent.	Date.	Fluctuation Per Cent.
1893. November	7½–9	1902. January..	5
1894. January..	7½–9	1903. January..	5
September	6½–7½	1904. January..	5
November	6–7½	May ..	5–5½
1895. January..	6–7½	October ..	5–6
December	5–7½	1905. January..	5–6
1896. January..	5–7½	1906. January..	5–6
April ..	5	1907. January..	5–6
1897. January..	5	1908. January..	5–6
1898. January..	5	1909. January..	5–6
1899. January..	5	1910. January..	5–6
1900. January..	5	1911. January..	5–6
1901. January..	5		

REMARKS ON THE TABLE.

The information is rather scanty, but the table presents certain well-marked characteristics, the most obvious of which is the decline in the rate of discount, indicative, perhaps, on the whole, of an increase of capital and of a gradually increasing financial stability. There are, of course, exceptions to this general statement; but these exceptions point only to those abnormal periods that have already been mentioned in connection with other aspects of the commercial history of the Dominion.

Thus, in comparing this table with the bankruptcy-rate (Table 7), we note a high rate of discount going hand-in-hand with a high bankruptcy-rate. This is particularly evident from 1879 to 1882, those years which followed immediately on the collapse of the boom of the "seventies." The rate appears to ease and become more regular from 1887 to 1892, these years also exhibiting a fairly heavy decline in the bankruptcy-rate. Compared with the present, the rate then was still high, but our exports were not of sufficient variety to insure commercial and financial stability.

In the latter part of 1893 and the first half of 1894 the rate of discount rises; the bankruptcy-rate also rises in 1894. That there was a temporary stringency at this time is confirmed by a fall in prices coinciding and synchronizing with the great banking crisis in Australia when thirteen banks failed, and with the milder one in New Zealand in connection with the Bank of New Zealand. After 1894 a rapid decline is observable in both rates, the rate of discount falling to 5 per cent., and remaining at that level till 1904, when it again rises. A very similar movement takes place in the bankruptcy-rate: its index numbers fall continuously till 1904, and then, like those of the discount-rate, rise again. It may again be remarked that in 1904 the upward

movement of the price-level received an abrupt though only a temporary check.

Since the rate of discount is dependent mainly upon the demand for temporary monetary accommodation, it is evident that a high rate of discount denotes an abnormal commercial state. Thus we have high rates during the boom of the "seventies," followed by yet higher rates on its collapse. In a similar manner, during the present century a milder land-boom (which, of course, could not be confined to land, but affected other interests—*e.g.*, building) has also been accompanied by a high rate. Conversely the period of active and healthy trade development from 1896 to 1904 was marked by the lowest rate on record. This period was also marked by a fast-vanishing bankruptcy-rate and a rapidly increasing marriage-rate. Statistics show this period to have been one of great trade development, the closer settlement of the country and the development of certain industries—*e.g.*, butter, cheese, meat—promoting a great increase of exports.

On the whole, therefore, an examination of this table confirms the conclusions derived from the other tables.

CHAPTER XVI.—THE CAUSES OF FLUCTUATIONS IN THE PURCHASING-POWER OF THE STANDARD OF VALUE.

THE result of the foregoing chapters leads to the natural inquiry: What has been the cause of the remarkable fluctuations in the price-level of commodities? Have they been due to causes affecting the supply of the media of exchange or to causes affecting the production of commodities? Or, if both, can it be even approximately determined how much is due to the one cause and how much to the other?

At least two features stand out in bold relief: a parallel, synchronous movement in both the New Zealand and the English price-levels, and a degree of variation in the price of farm products not observable in the price of non-farm products. The first leads to the conclusion that there has been some great general cause operating over the whole world of commerce; the second implies that local conditions have disturbed, but never permanently altered, the effects of that cause. As the variations due to local conditions are irregular in their nature, and are in the long run overruled by the more general causes, they can be here briefly dismissed. They may perhaps be enumerated as variations due to local scarcity, which may itself be due to decreased production, or to a sudden increase of population, both causes having their effects intensified or mitigated by the nature of the facilities for transport and communication.

Turning, then, from local and irregular conditions to the more general causes which have manifested themselves, the question arises: Is the remarkable parallelism of the English and the New Zealand price-levels due to some general cause affecting the conditions of production of the articles themselves, or is it due rather to conditions determining the supply of the media of exchange?

Let it be stated at the outset that the price-level is dependent (other things being equal) upon the ratio between the amount of commodities on the one hand, and the volume of the media of exchange (using that term in its widest sense) on the other. The maintenance of a uniform price-level would require one factor to increase or decrease *pari passu* with each increment of increase or decrease in the other. A falling price-level therefore indicates that the amount of commodities marketed has increased without a proportionate increase in the volume of the media of exchange; while a rising price-level indicates that the increase in the volume of the media of exchange has not been matched by a proportionate increase in the amount of commodities marketed.

As the volume of the media of exchange is dependent on many conditions, especially upon the amount of gold in stock, a keen controversy has arisen as to whether the annual production of gold has an intimate effect upon the price-level. Those who deny such an effect say that the annual production of gold can be but infinitesimal compared with the total volume in stock, and, furthermore, during the period of lowest prices there was not even an apparent scarcity of the metal. To the first contention it may be replied that the rapid development of the means of transport and communication, the increasing good will of nations, the light which economic investigation has thrown upon the problems of currency and finance, the spread of education, and the amelioration of commercial law, which have undoubtedly brought in their train an increasing honesty and a greater confidence—it may be urged that all these factors have co-operated to render our banking and credit system so delicately organized that a relatively small increase in the volume of gold will support a much greater increase in the volume of credit. This is at once the merit and the defect of our system of banking and currency.

To the argument that there was not even an apparent scarcity of gold during the period of low prices, the most natural rejoinder is that since it is a physical impossibility for the volume of gold to accommodate itself to the price-level, the price-level must perforce accommodate itself to the volume of gold. Thus, commodities, relieved of part of their price burden, were transported with ease in increasing volume along the highways of commerce by a relatively slower increasing force of gold.

Though it is admitted that, owing to the various factors enumerated above, our credit system has attained a wonderful

degree of development, and that the same factors have caused each unit of the media of exchange to do more work than before, still, it must, I think, be admitted that it is impossible to expect our credit system to maintain the same rate of development in the future as it has done in the past. If this is so, then it becomes more and more important that the production of gold should increase at a greater and greater rate, for it has at least three adverse factors to contend with — (1) the declining rate of development of the credit system; (2) the liability of the system to sudden contraction, owing to commercial and financial panic; and (3) the fast increasing rate of production of commodities. It is to this last factor—the enormous development of industry during the latter half of the last century, a development due to a great improvement in the industrial arts, to the advantages incidental to division of labour, the localization of industries, the organization of capital, and development of credit—it is to this that we must look as one of the principal causes of the great appreciation of the standard of value during the latter half of last century. This great development was aided by the vast accumulations of capital made possible by the cessation of great wars, and by the opening-up of new countries and the regeneration of old. The result was that the demand for currency necessary to keep prices at a given level exceeded the supply. The decline in prices was hastened by the coincident decline in the production of gold, and by the demonetization of silver by the leading commercial nations. Against such powerful factors as the above, the development of the credit and banking system of the world waged an almost ineffectual struggle.

Production of Gold and the Price-level.

In Table 8 I have given index numbers of the annual gold-production of the world based on the standard: average annual production of gold during the decade 1890–99 = 100. I have also included in a separate column index numbers of the production of gold in New Zealand, based on a similar standard; and in other columns are index numbers of the prices of commodities in New Zealand and England. A comparison of the various columns leads to some interesting conclusions. From 1861 to 1870 the production of gold increased and then declined, and prices rose and fell in sympathy. The decline in gold-production and prices continued throughout the "seventies," broken only by a brief rise in prices during the "mid-seventies"—a rise due probably to inflated credit, and in New Zealand partly to a great expenditure of borrowed money. The decline in gold-production continued till 1887, and prices moved downward in consequence. It will be noticed that the fall in prices is much heavier than the decline in the gold-production; but this is only to be expected when we consider the development of industry that was taking place.

From 1889 the gold-production of the world showed a continuous increase, but prices continued to fall. This does not, as some maintain, invalidate the theory that the price-level depends upon the annual production of gold; it merely demonstrates the fact that even with the increased production the supply of gold was not sufficient to keep prices from declining. It can fairly be assumed —though never proved—that if the gold-production had remained stationary, prices would have declined to a still greater extent. This theory seems borne out by the fact that the increasing production of gold at length successfully counteracted the tendency of prices to fall, and after 1895 succeeded in converting an appreciation of gold into a depreciation. Point is given to this by the fact that, owing to the decline in gold-production which followed the closing of the Rand mines, the price-level fell as soon as the unnatural inflation produced by the South African War was over. As it took some years to raise the gold-supply to the level it might otherwise have attained but for the war, so prices were correspondingly slow in rising. But by 1906 the rapidly increasing output of the mines, and, we may well suppose, the buoyant credit induced by this uninterrupted increase, causes prices to rise rapidly during 1906 and 1907. The stationary output of 1907 and 1908, however, tells its tale in the declining price-level of 1908. Here we may presume that to a stationary gold-production was superadded a contraction of credit. Once again, therefore, the demand for currency had outrun the supply. The overloaded train of commodities moved more slowly, owing to the relatively diminished tractive power of the currency.

General.

A peculiarity of the tables is the coincident decline which they show in the gold-production of the world and of New Zealand. The decline was naturally the more irregular in New Zealand, owing to its smaller area, and this irregularity is the more marked from 1860 to 1880. There was later on over the same areas an almost synchronous increase in gold-production, most prominently marked after 1895. This increase must be ascribed in great part to improvements, chiefly chemical, in the processes of production. Another point to be observed is that the production in both tables shows a sudden check in 1907 and 1908. This may be due to an exhaustion of mines, or, what, is just as probable, to the abandonment of lower-grade mines, owing to the depreciation of gold rendering the cost of working them prohibitive. In such a way the production of gold automatically regulates itself in a more or less rough-and-ready way, in a manner somewhat analogous to the production of cereals from lands of varying degrees of fertility. Just as an increased demand for cereals calls into cultivation lands of lower degrees of fertility, so will an increased volume of trade stimulate the working of lower-grade mines. But gold-mines are fewer and less readily accessible than arable lands; neither

is there such a gradation in quality observable in them. The supply of gold will, therefore, not adjust itself to the demand with that readiness which is characteristic of the products of the soil.

What would have happened had not further goldfields been discovered in the "nineties," and improved processes of production rendered profitable the working of lower-grade mines, is not quite in place here to discuss. The stress of the "eighties" and "nineties" has passed away, but it is not difficult to see that such a period must again recur, unless the supply of gold is much greater than is anticipated, or unless by legislation or otherwise something is substituted for, or added to, the present media of exchange.

The evil of a changing price-level has been adverted to in a previous chapter; and economic science will not have done her work until she has not only laid bare the predisposing causes, but has suggested a practicable remedy for mitigating their evil effects. In so far as the evil lies in the failure of the media of exchange to adapt itself readily in volume to the varying demands of commerce, economists and statesmen should be able to devise a remedy. This, however, is not the place for discussing the various remedies that have been suggested. It is sufficient to indicate that the problem contains a psychological element, inasmuch as any medium of exchange must be such as will be generally acceptable, and not liable to exceptional variations in amount at the whim of individuals or Governments. It is this element which makes any alteration in the present system so hazardous an undertaking. The operation of the present media of exchange is also influenced by a similar element, in so far as credit is subject to periods of contraction or inflation, and as the amount and nature of the media of exchange depend in great measure upon the mental and moral characteristics of the community. However, just as changes in the mental and moral characteristics of the race have rendered possible a development of credit quite impossible in more remote times or among more primitive peoples, so, too, may a further development of these characteristics make possible the adoption of a medium of exchange from which statesmen and financiers shrink at present.

Table 8.

I have added a table (Table 8), giving, among other things, index numbers of gold-production for the world and for New Zealand.

CHAPTER XVII.—SUMMARY OF RESULTS.

Index Numbers of General Prices.

I shall now recapitulate the most important results obtained by an examination of the tables. In the first place, there has been a heavy and almost continuous fall in the general level of prices over the whole period of my investigations, with the exception of a short period of rising prices at each end. In the second place, the movements in the New Zealand price-level have synchronized with similar movements in the English price-level. The fall, however, in the New Zealand price-level was greater than in the English price-level, especially between 1861 and 1871. Since that time the fall was almost equal in both countries. This is shown to be due chiefly to the development of the means of communication between New Zealand and England. New Zealand prices reached their lowest in 1895, a point touched by English prices in 1896. Since the beginning of the present century there has been a rise in the price-level—a rise much more prominent in the English than in the New Zealand tables. Both tables show a falling price-level in 1908. Index numbers based on farm products show that it is to the increased price of farm products that the rise in the average price-level in New Zealand is mainly due.

This movement in the New Zealand price-level is corroborated in general detail by two other sets of index numbers obtained by different methods—one based on statistics of trade and shipping, and the other on trade and population. Both show a long period of prices falling to their minima in 1895, and thereafter rising rapidly. Both exhibit several well-marked variations, which are also common to the index numbers based on prices.

Farm and Non-farm Commodities.

Separate tables for farm and non-farm commodities show that the decline in the former was more rapid than in the latter. The decline in the former culminated about 1895, but in the latter the minimum was not reached till ten years later. The subsequent rise in farm commodities has been much more rapid than the rise in non-farm products. Non-farm products, which have been shown to be more intimately dependent than farm products upon the English price-level, have also shown a much more regular decline in price, and reasons have been assigned for this phenomenon. It has been shown that fluctuations in the prices of farm commodities have had more pronounced effects upon the prosperity of the country than variations in the prices of non-farm commodities. The intimate association of booms and crises with, and the close dependence of the marriage and the bankruptcy rate upon, the price of farm products have been sketched in detail.

The Marriage and the Bankruptcy Rates.

The index numbers detailing the movements in the marriage and the bankruptcy rates have exhibited well-marked characteristics. Both are very intimately dependent upon the prices of agricultural and pastoral products. The movements of the one are, of course, opposite in direction to those of the other, the former reaching its maximum and the other its minimum during the present century. Both tables are necessary in order to interpret correctly the social and financial condition of the country as outlined in general detail by the system of index numbers based on prices of commodities. Both show the effect of the great gold-discoveries of the early "sixties" and the depression of the later "sixties." Both mark equally well the buoyant spirit of the "mid-seventies," a buoyancy due to an apparent world-wide depreciation of the standard of value, coupled with a comparatively huge expenditure of borrowed money. In both tables we have the most convincing testimony of the depression which followed the overspeculation of the "seventies"—the decline in the marriage-rate and the rise in the bankruptcy-rate, showing that the social and financial effects were more disastrous than might be deduced from the mere decline in prices.

These rates also yield more valuable evidence of the increased commercial stability and social prosperity imparted to the community by the rapid development and diversification of its resources than can be gained by an examination of the index numbers based on prices, since the latter numbers, of necessity, take account only of prices, and not of the varying quantities sold at those prices. This is strikingly evident since 1898. Finally, it may be recalled that the marriage-rate, like the general price-level, reached its minimum in 1895.

The Influence of Variations in the Production of Gold.

Statistics of gold-production have been discussed, and the dependence of the price-level upon the ratio between the amount of commodities marketed and the volume of the media of exchange has been noted, with special reference to the sinister effects of the decline or stationariness of the gold-production. The causes and the effects of an increasing gold-production have been pointed out, and the opinion expressed that economic science may yet be able to suggest to the statesman how the social, industrial, and commercial benefits accruing from an ideal medium of exchange may be obtained independently of the output of gold.

The Significance of the Discount Rate.

The fluctuations in the rate of discount have also been examined, and the connection of the rate with the financial state of the country revealed. It has, in particular, confirmed what the bankruptcy-rate told of the overspeculation of the "seventies," of the buoyancy

and commercial stability of the period of 1897 to 1903, and of the well-marked but less exaggerated boom of the past few years.

Throughout the work reference has been made to the social condition of the country. Evidence has been adduced to prove, and reasons assigned for, the existence of periods of inflation in the "mid-sixties," the "mid-seventies," and during the present decade; in a similar manner have been treated the depression of 1869–71, and the greater depression between 1879 and 1890.

Political Factors in the Development of the Country.

Special attention has been directed to the influence of the Government in promoting the prosperity of the country. In particular, reference has been made to the ambitious public-works policy of the "seventies," which added fuel to the speculation of that time, and intensified the evils which followed, though it must be added that the leading principles of that policy have been amply justified. The evil lay in concentrating too great an expenditure on public works within too limited a period, with such attendant evils as premature development, wasteful finance, political "log-rolling," unnatural trade activity, land-speculation, and a rapidly increasing burden of national debt. So, too, has attention been directed to the more active assistance given by the Government to the trade of the country since 1890 in the matter of the closer settlement of the country, the establishment of experimental farms, the appointment of inspectors, and the grading of the staple articles of export. Nor must reference be omitted to the influence of such measures as the Arbitration and Conciliation Act in maintaining in some measure that industrial peace without which the full commercial development of the country cannot be secured.

Tables and Diagrams.

Tables and diagrams to illustrate the various features of this inquiry have also been supplied.

In Conclusion.

Finally, it has been a source of keen satisfaction to feel that, though this country has passed through periods of deepest gloom—partly unavoidable, since they were the effects of causes of world-wide operation, and partly peculiar to New Zealand, since they were due to local political and social conditions—yet during the past decade she has enjoyed a degree of financial stability and social prosperity previously unexampled in her history.

APPENDIX.

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