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Three animals I have in mind as long-lived are all vegetarians: elephants, tortoises and parrots.

Reply: I quite agree that some herbivorous animals are long-lived, but what I actually said was: "amongst human animals there would appear to be positive correlations between stature, length of life, etc., and consumption of animal products." I also qualified that by stating that low consumption of animal products often went hand in hand with semi-starvation. By and large, a survey shows that the nations that are the greatest consumers of animal products have the highest expectancy of life and the greatest freedom from disease, and in general their stature is rather better than those which are not able to afford to eat many animal products.

Professor W. Riddet: I note you have drawn attention to the dreadful waste of skim milk. You state that five gallons of skim milk are required to produce one pound of pork. I have a feeling you are kind to the pig in this connection. From a calculation made some time ago I doubt whether the efficiency is so high. Have you taken into account the overhead for feeding sows and boars?

Reply: I think five gallons is the figure which is generally accepted as the amount necessary from weaning to slaughter. It does not take into account the overhead for feeding sows and boars, but that of course makes the position even worse.

Dr F.W. Dry: Is Dr Filmer thinking of applying the Wisconsin blood tests or other blood tests to the early recognition of dairying worth? I would like to give him every encouragement to try to recognise the breeding worth of bulls by this methods. I wonder whether those who are testing may be more hopeful in recognising that bulls may be tested for lifetime merit with the aid of these tests?

Reply: The work at present is purely of an exploratory nature. These blood tests have been devised by Wisconsin workers and they are so accurate in establishing the identity of an individual cow that they are now accepted officially by at least two of the Purebreed Associations in the United States. This sort of thing can happen: if a cow is inseminated at two successive heat periods by different bulls and the birth of the calf is between the expected birth dates, the Breed Societies are willing to accept the blood test as a determination of the paternity of the calf. They state that in several thousand animals they have never found two (other than identical twins) which gave an identical survey. For the first time we have some thirty odd readily identifiable, simply inherited characters, and it does seem to me that it opens up a hope of being able to assess the genotype by some physical means without recourse to long breed experiments. How that can be done is for the future to decide - we just live in hope!

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"ECONOMIC CONSIDERATIONS AFFECTING INCREASED PRODUCTION"

by

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The opening speaker in this discussion has stressed the need for increased food production to meet even the minimal dietary requirements for health and well-being of the world's population and has pointed out that the maximum pre-war production of food-stuffs was grossly inadequate for human needs. That realisation in itself is a considerable advance but much more must be done

before the objectives set at the Hot Springs Conference can be achieved.

Other speakers have reviewed the physical factors of production and there is no doubt of the potential scope for increased production in this country. It remains therefore to review the economic factors which motivate the farming community and in the last resort determine whether our latent potential for increased production is realised or allowed to remain untapped.

Now, in discussing economic factors, I have had to assume that in the post-war period we will be living in a capitalist economy where development will be directed primarily by "enlightened self interest". On this assumption the question of whether food production in New Zealand is increased or diminished will depend mainly on whether farming "pays" relative to other forms of economic activity - in other words, whether farming is able to attract labour and capital for further development. In posing the question in this form I have used the word "pay" in its widest sense to include satisfactions and rewards which cannot be evaluated in monetary terms but which contribute in no small measure to the final answer given by the individual.

Dealing for the moment with those factors directly affecting monetary rewards, the main factors may be divided into external or world influences and internal conditions operating within New Zealand. The main external factor affecting the issue is the real price that we receive for our exports, but this is affected by a number of influences which may repay further examination. These factors affecting the price we receive are, briefly:-

1. Effective demand for foodstuffs which in turn depends on:
  - (a) Freedom of trade from hampering restrictions, stability of exchanges, and confidence in the continuance of those conditions.
  - (b) The degree of full employment achieved which depends on the level of consumption and investment.
  - (c) The standard of living or real income in consuming countries.
2. Supplies available in relation to the effective demand - this must include the supply of alternative or substitute products such as margarine or synthetic fibres.
3. Terms of trade or the volume of goods received in exchange for a unit of exports.

Now it will be obvious even from this brief catalogue that many of these factors are inter-related and will in turn be influenced by other and by no means unimportant considerations. As Mr Nash, Minister of Finance, pointed out to the Dairy Conference last week we cannot isolate ourselves from the rest of the world - we share their prosperity or their poverty - no longer is it possible to isolate this country from the effects of overseas events. It seems necessary, therefore, to examine the effects of these factors in a little more detail:

An effective demand on overseas markets is assured for all the foodstuffs we can produce for the next four years, the United Kingdom Ministry of Food having contracted to take all our exportable surplus of dairy produce and meat for the next four years while European agriculture is being rehabilitated. It is difficult to obtain factual information in regard to the condition of Continental agriculture though it doubtless varies considerably from country to country. The latest information available indicate

that the number of cows in milk in Denmark has been reduced by 13% and production per cow by 25% - a reduction in total output of 35% which should be rapidly regained when animal feeding stuffs are once again available. The possibility cannot be excluded, of course, that when the Nazis evacuate countries like Denmark they may destroy her crops and livestock for their own immediate consumption and radically alter the position outlined. The position in areas like Poland and large parts of Russia must also be very different from that in Denmark and these areas will require many years to completely rehabilitate their farming industries.

Turning now to the longer term picture, there can be little doubt of the need and potential demand for increased food-stuffs even in the advanced countries of Western Europe. Taking an average of the five years 1934-1938 the consumption of foodstuffs is given in the accompanying table.

Consumption of Foodstuffs in Selected Countries  
(lbs. per head per annum)

Foodstuff	N.Z.	U.S.A.	U.K.	Denmark	France	Germany	India
Cereal products	194	196	197	198	280	222	460
Sugar and syrup	112	110	109	120	56	56	5
Meat	250	126	143	125	74	100	9
Fish (fresh & canned)	24		45	x	x	x	
Eggs (Number)	300	240	153	90	149	126	
Potatoes	203	157	210	264	400	398	11
Margarine	x	3	8	45	x	15	18
Butter	40	17	22	17	13	16	-
Cheese	5	5	10	12	12	13	-
Milk (gallons)	30	33	20	36	23	21	7
Av. Real Income I.U.	710	545	584	347	358	343	64

Figures relating to the average consumption of the whole population are, of course, not necessarily typical for different income groups within the population - such differences are necessarily concealed in a national average. With rising standards of living all Western European countries have enjoyed an increasingly diversified diet during recent years, and there has been a marked increase in the consumption of "protective foods" such as dairy products, eggs, fruit and vegetables. There is considerable scope even in these advanced countries for further improvement in diets, particularly among lower income groups, and these changes are likely to be accelerated rather than retarded by the impact of war.

While that is true and was the main theme of the Hot Springs Conference, the very real difficulty arises - how are these people to so alter their agriculture that they can produce their requirements or how can they produce goods to exchange for them on the world's markets. This immediately raises the question of tariffs, embargoes and all the other barriers to trade which have been erected during the inter-war period. Their influence is clearly shown in the case of butter - in 1934 when N.Z. butter was selling on the London market for 73/3 butter was priced at 208/9 in Paris, 199/3 in Berlin, 172/- in Belgium and 114/3 in New York. We in New Zealand are guilty of the same sin - motor cars and most manufactured goods are subjected to tariffs and cost approximately double what they do in the country of origin, and under import licensing many are virtually excluded from our markets. If we are going to ask these potential markets to be reasonable and remove tariffs and embargoes from our butter and other primary products, then we must be prepared to reciprocate and lower our own tariffs and remove exchange control. The decisions of the recent Monetary Conference at Breton Woods, if ratified by the participating Governments, should go a long way towards avoiding violent fluctuations in exchange rates which destroy confidence in the

emergence of profits from international trading, and one hopes that such steps will lead to a continued growth in the volume of international trade in the post-war period.

It would be unrealistic to suppose that the post-war period will necessarily see any reduction in trade barriers - those of you who listened to the Prime Minister's speech last night (7th August) will have heard that, insofar as New Zealand is concerned, there are special reasons why we cannot dispense with tariffs and exchange control - and no doubt every other of the 55 sovereign states will find equally cogent reasons for not lowering tariffs, embargoes, etc. We have paid the price of war but we are unlikely to pay the price which peace will demand unless public opinion realises the issues involved and is prepared to make the sacrifices in short term profits which may be necessary.

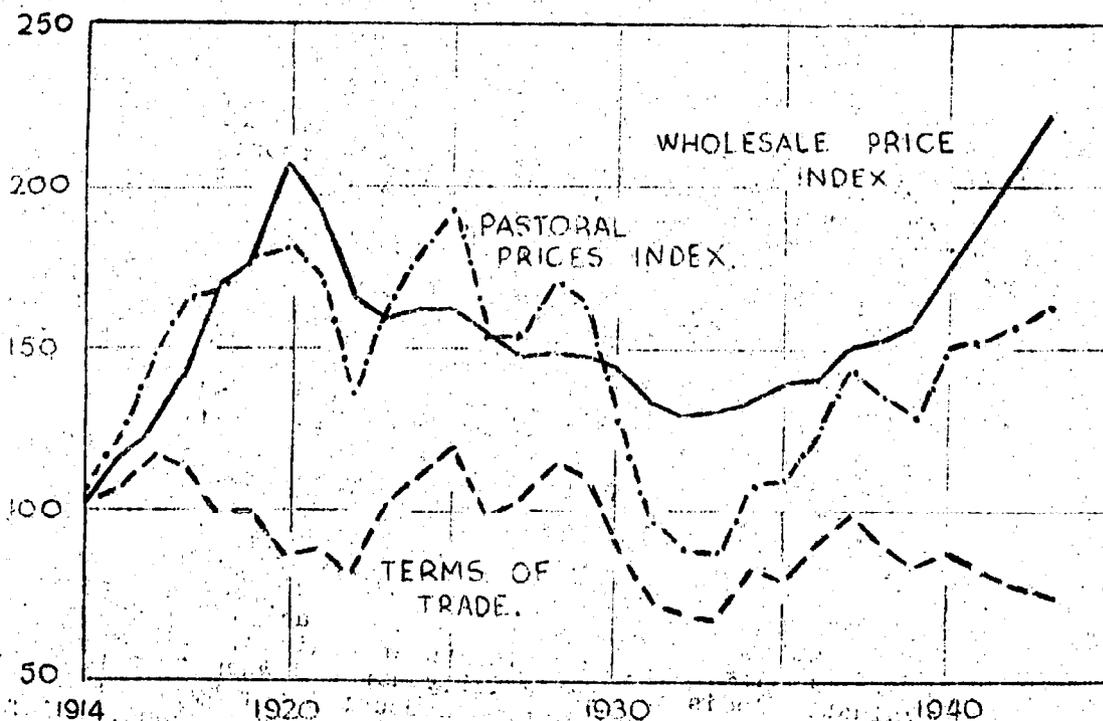
Given reasonable freedom of trade and stability of exchanges, it seems likely that policies aimed at full employment in U.S.A. and Britain will be successful. The importance of full employment lies in the fact that the degree to which the population of working age is fully employed, together with their average productivity, determines the average real income per head of the population and hence their purchasing power and their ability to save for purposes of investment. In endeavouring to maintain a condition approaching full employment Governments will, however, require to be very circumspect or they may, with the best of intentions, undermine the confidence of investors and precipitate the very condition they wish to avoid.

The supplies of foodstuffs entering world trade are subject to many influences and I do not propose to discuss them here except to mention the growing threat from substitutes in the shape of margarine and synthetic fibres. In conditions approaching full employment I believe effective demand will be such that there is ample scope for both the natural product and the substitute, but developments follow one another so rapidly in this field that it should be carefully watched and we should endeavour by research so to improve the quality and uniformity of our products that we can meet the competition to which our products will undoubtedly be subjected.

Turning now to internal factors the question of farm costs is of paramount importance since, in conjunction with the level of export prices, it determines whether or not we can profitably sell our goods on the world's markets. The main items in farm costs are:-

1. The cost of goods and services used in production, or, more exactly, the real cost of these in terms of farm products - affected by tariffs, wage rates, hours of labour, etc.
2. The cost and availability of farm labour.
3. The cost and availability of land and capital.

There is time only to touch briefly on these points. The following graph shows the index of export prices of all pastoral products, the wholesale price index and the ratio between them, or terms of trade - that is, the average quantity of goods included in the index obtained in return for 100 units of average pastoral produce. In general the farmer's terms of trade improve at the commencement of a period of rising prices but are fairly rapidly overtaken by rising commodity prices and the terms of trade usually start to fall before the peak of the price cycle is reached. The downward movement is accelerated as trade recession sets in, since farm prices fall farther and faster than commodity prices. The terms of trade fell to very low levels in the depression but showed some recovery by 1937, since when they have shown a gradual decline.



10) A given quantity of average pastoral exports will now buy 23% less average commodities than in 1937 and the discrepancy would be much greater if only imported commodities were considered. Unless these adverse terms of trade improve in the post-war period we are not likely to have a prosperous farming community able to attract the labour and capital necessary for the expansion of production.

Nationally we are concerned with the terms of trade in our overseas markets since these determine the volume of goods or services we receive in exchange for our exports and hence affect our average real income or standard of living. Insofar as he is a member of the community the farmer is also affected by the terms of trade overseas, but he is more particularly concerned with the local terms of trade which are affected by the ruling tariff policy. Protective tariffs such as those on farm machinery, timber and cement affect farm costs directly - others have an indirect effect by raising living costs and fostering less efficient secondary industries which compete with farming for labour and capital so raising farm costs and diverting resources into less productive channels.

Colin Clark suggests that the terms of trade for primary produce will by 1960 improve by as much as 90% from the average level of 1925-34. He says, "At first sight it may seem rather hard to accept a movement so violent as this. Consider, however, the two largest factors determining this result. The first is the rapid industrialisation (even though productivity will be low) of Japan and China, and their consequent development as exporters of manufactured goods and importers of primary produce. The other predominant factor is the anticipated continuance of the rapid growth of output per head in the U.S.A. These two large-scale events within themselves constitute a world industrial revolution."

Wages are a major item in farm costs representing approximately 50% of the value of output. If they rise above this point farmers tend to dispense with labour, and if they fall far below labour tends to drift to other employment. The cash wages of dairy farm workers have increased from 30/- in 1918-17 to 57/6 in 1942-43 while the real cost in terms of butterfat has approximately doubled; if allowance is made for "keep" the real cost as a percentage of value of output has stayed approximately constant due to the considerable increase in output per unit of labour during the period.

A point of particular interest is the relationship between farm wages and the average of all industrial wages (excluding overtime). In times of business activity farm wages have averaged approximately 80% of industrial wages - in times of depression they have fallen to 63-65% of industrial wages due to the inelasticity of industrial wages. In such conditions farm wages have actually fallen in terms of the product and farming has absorbed additional labour. Since wages are such an important element in farm costs and since they bear little or no relation to farm produce prices, any factors which raise industrial wages and hence farm wages are a matter of the greatest concern to farmers.

In the future the cost and availability of labour may be influenced very greatly by population trends. Since 1901 there has been an almost parallel increase in numbers and decline in percentage of occupied males engaged in primary and secondary industry while there has been a marked increase in both numbers and percentage engaged in tertiary industry. The proportion of labour engaged in tertiary industry is closely related to the average standard of living of the community and if the postwar period is one of prosperity there may be a tendency for tertiary industry to draw labour away from both farming and secondary industry.

The cost of land is high in New Zealand. Approximately £2000 of capital is required per male labour unit engaged in dairying, and of this amount a large proportion represents the cost of land and improvements. The outlay is probably higher in the case of sheep farming. With a few exceptions this is a much higher capitalisation per worker (not per factory unit of course) than in secondary industry where capitalisation varies from £200 to £1000 per male equivalent employed.

In the strict economic sense rent (or interest on capital value of land) is not an element of costs, and if all land were actually owned by the cultivator it need not enter into our discussion. This, however, is not the case, most of our so-called freehold being in effect a form of disguised landlordism. The readiness with which small deposits are accepted in the sale of farm lands, the remainder being "left on mortgage", is too well known to need discussion. The effects of this system have been twofold; firstly, it has greatly increased the number of potential purchasers of land thus tending to raise land prices and reduce the surplus available as labour reward; secondly, the tendency has been for land to be loaded with interest payments so close to ruling price levels at the time of purchase that even a minor fall in produce prices has prejudiced labour rewards or led to difficulties in meeting interest commitments. Higher produce prices or subsidies will not rectify the position over any period, since assistance of this type is rapidly capitalised into increased land values. No simple solution of the problem seems possible, but if the standard of living of the farming community is to be raised the problems of land tenure will have to receive the most careful consideration.

The effect of high fixed overhead costs in dairy farming was well shown during the depression when production increased markedly in an endeavour to meet interest and capital commitments. The fact that the real cost of labour fell during the depression may have been a potent factor in eliciting this response and it will be interesting to see whether the reaction will be similar in future depressions if the level of farm wages is prevented from falling/sympathy with produce prices. Conversely, as prices rise past a point where fixed charges can be comfortably met, there is a growing tendency for recreation to compete successfully with the desire for increased net income - a tendency well illustrated by the change-over from dairy to fat lamb production in times of rising prices - an effect complicated, however, by rising labour costs in the same circumstances.

New Zealand and Australia occupy a unique position as the only two countries where the farming industries show a higher net productivity per unit of labour than secondary industry. Under these conditions every transfer of labour from primary to secondary industry lowers our average real income or standard of living. The present tendency to talk only in terms of expansion of secondary industry, if pursued, is calculated to raise internal costs and, carried to extremes, might seriously prejudice our ability to compete on the world market.

Average Real Net Productivity per Head in I.U.  
(Adapted from Colin Clark)

Country	Primary Producers	Secondary Industry.	Tertiary Industry
New Zealand (1934-35)	2,444	1,490	840
Australia (1925-34)	1,524	905	800
Canada (1925-34)	618	1,855	1,578
U.S.A. (1937)	701	1,852	2,765
Britain (1936)	475	815	1,775
Japan (1934)	120	550	795

This should not be construed to mean that we should immediately scrap all our secondary industries. The great bulk of the people employed in secondary industry are in trades such as building, the processing of primary products, public utilities like gas works, etc. The numbers who would be adversely affected by a lowered tariff policy is actually quite small - probably not more than one-fifth of the total at present employed in secondary industry. Both during and prior to the war we encouraged by tariffs and other means the expansion of secondary industries which could not have existed without protection.

Now those very briefly are some of the main economic factors likely to influence whether or not we develop our undoubted potential for greater production. Just briefly to summarise, it seems to me that the long term prospect on overseas markets is distinctly hopeful - the potential demand is there - the uncertainty lies in whether or not Britain and U.S.A. can successfully pursue a policy aimed at full employment of the working population and whether the peace that we fashion is such that the peoples of the world have sufficient confidence to abandon the policies of national self sufficiency which have developed in the inter-war period; will it be such as will help to free us from the exaggerated fears which have tempted us to try and purchase security at the price of servitude and lowered standards of living implicit in a policy of insulation.

Within New Zealand we must redress the balance of rewards so that the primary producer obtains a return commensurate with his productivity and make sure that short-sighted policies do not undermine his efficiency or so raise his costs as to prejudice his ability to compete on the world's markets.

Now I'm sure that you must be feeling a bit like Alice in Wonderland where the Duchess said: "and the moral of that is - 'Be what you would seem to be' - or if you'd like it put more simply - 'Never imagine yourself not to be otherwise than what it might appear to others that what you were or might have been was not otherwise than what you had been would have appeared to them to be otherwise.'" "I think I should understand that better if I had it written down", said Alice."

Mr A.H. Ward: Would Dr Hamilton care to define a little more clearly the question of "efficiency" in primary industries as between countries? To what extent is "efficiency" measured by efficiency of technique and to what extent is efficiency linked with superiority of natural resources?

Reply: If I explain the basis of figures of Colin Clark's it will help. He terms them "net productivities". If you try to assess the amount of agricultural production in any country you immediately run up against difficulties. Take for instance the question of agricultural production in New Zealand. We produce something like 9 or 10 million bushels of wheat a year at approximately 6/- a bushel - an artificially high price which applies only to New Zealand. Only part of that wheat is actually sold at that price; part of it is used for sowing next year's crop - it is not net production; part of it is fed to animals and reappears, possibly as eggs. It is very easy to do a lot of double counting; first as grain, then as livestock production, and then as seed for sowing, etc. etc. In a number of cases where an attempt has been made to arrive at productivity per head double counting has occurred. In Denmark 90% of the wheat crop is actually fed to animals and only 10% is sold for consumption off the farm. In naming his figures "net production", Clark indicates that that double counting has been removed. Also the production has been valued at the average figure received in the United States over the average of a ten year period - 1925-1934. His reasons for choosing the United States were that the United States produced within its own boundaries practically every known agricultural product. In certain cases that doubtless leads to a certain amount of overvaluing; for example they have a tariff against butter and their butter value is rather above world parity. I have checked these figures of Clark's, using world values as given by the League of Nations in 1937, and it does not materially alter the ratio between countries. The figures do not represent efficiencies unless you are measuring efficiency in terms of output per labour unit employed.

Professor W. Riddet: In presenting your figures for efficiency of secondary industry production in New Zealand, the figures indicate that efficiency is high as compared with many other countries. You also mentioned that you included in the secondary industries the processing of primary products. Can you remove these from the total and determine the efficiency of the manufacturing industries, and if so how do they compare with other countries?

Reply: That has not been possible. You can arrive at an approximate figure, but it is not a figure I would like to publish.

Professor W. Riddet: Realising that efficiency is high in our primary processing industries, that would reduce the efficiency in our other secondary production?

Reply: Yes.

Mr G. Holford: Would increased prices for primary produce raise or lower production in New Zealand?

Reply: Provided the price rises to the point where the rewards in farming are greater than the rewards in other industry, then I think that these higher prices would lead to increased output. There are a great many complicating factors, however. The moment you start to get a rise in price you at the same time get a rise in costs because other people share in the benefits of these