1957 Farrer Memorial Oration . . .

ECONOMICS—THE NATION AND THE INDIVIDUAL

By J. G. CRAWFORD, C.B.E., M.Ec., Secretary of the Department of Trade

To-day I stand before you as an administrator. Yet it is not in this role that I wish to address you—although occasionally the devil will out. I am not here to defend or attack Government policies—although some policy problems must necessarily make the material of my address. My primary aim is to speak as an economist and to illustrate the relevance of economic thought to what are generally regarded as economic matters in the life of the nation, industry groups and the individual. As befits the occasion—a memorial to a truly great pioneer in the development of Australian agricultural science—most of my material will relate to agriculture.

My secondary aim is to show that economics and economists have something constructive to offer in the way of methods of thinking and analysis when it comes to resolving problems in the broad fields of production and consumption of goods and services—whether at the national or farm level. In particular, I believe that agricultural economics—badly lagging behind agricultural science as it has been[1]—is a necessary complement to agricultural science in the pursuit of those national and individual objectives in which the rural economy of Australia is vitally concerned.

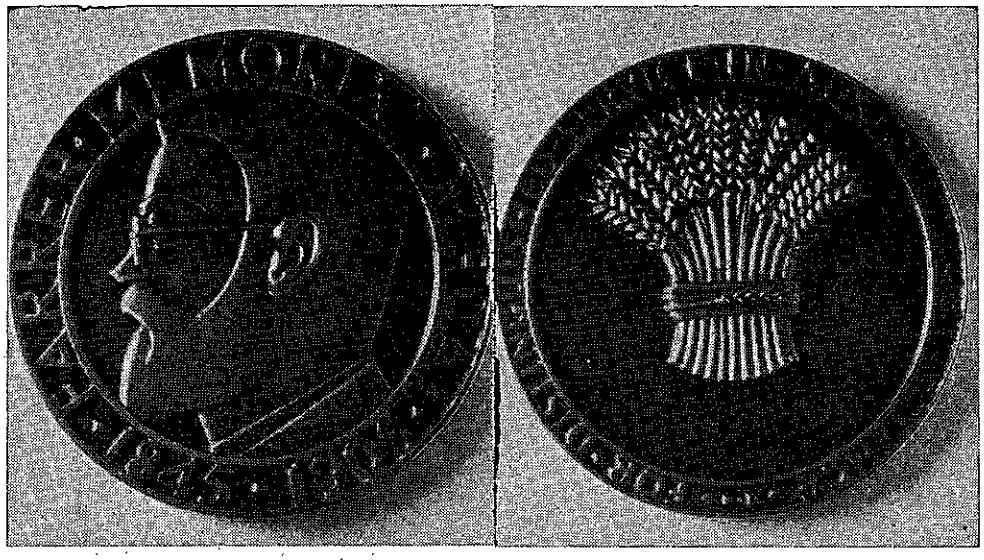
I had better start with some observations on what is meant by economics. In doing so I hope to avoid metaphysical argument which like so much in theology could exhaust us all before we had exhausted it. For, indeed, the literature of economics is studded with the soul searchings of the more philosophical of economists as to the nature and limits of their science, in particular the relationships between pure theory and its application to those day to day problems and decisions which are called business decisions in the case of individuals and policies when made by Governments.

For most purposes there is no need to look for too much precision. If we note what some individuals think economics is about, I believe you will be able to agree with them without trying to hit on a precise abstract definition of economics as a social science.

The Wealth of Nations

No harm is done by beginning with Adam Smith, the first great British and world economist. Smith, in 1776, in "the Wealth of Nations", declared the field of "policital economy" to be "the nature and causes of the wealth of nations". To the many of us trying to forward the growth of the Australian economy this seems to give pretty wide room for economists to work in and in which, perhaps, to do their damage. In 1890 Marshall, another in the line of great English economists, declared

[1] This neglect is not restricted to Australia and a recent report of the U.S. Council on Economic and Cultural Affairs states that "unfortunately, in the history of agricultural science in every country, there has been a twenty to thirty years' lag in the development of the science of agricultural economics compared to that of the biological and physical sciences". This comment was prompted by conditions in various Asian countries, but it is still relevant to the more advanced and sophisticated agricultural economies such as our own. It is worth noting that in his day Farrer's complaint was the general apathy towards agricultural science. He did much to awaken interest —but he could hardly forsee the great interest in, and support for, agricultural science that to-day's farmers display.



THE FARRER MEMORIAL MEDAL is awarded annually to commemorate the work of Australia's great wheat breeder, William James Farrer, and to mark distinguished service to agricultural science. The oration by the recipient is an important item on the programme of the congress of the New South Wales Agricultural Bureau at which the award is made.

economics to be "a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and the use of the material requisites of well-being".[2]

A great many others have translated this to mean that economics is concerned with our material welfare—what makes us as "well" or "poorly off" as we are and what will increase our well-being. These are the "welfare" economists who, broadly speaking, accept the view that the more goods and services or "wealth" we own at any point of time, and (the limit for most of us!) the more we individually acquire or enjoy as income in a year, the better off are we. Thus Australia is thought to be better off than China because its people, on average, enjoy a command of more goods and services than does the average Chinese. Likewise, Australians are better off to-day than they were, say, 20 years ago, because, again on average, our real incomes are higher; the average man has more of the things which make up his living standards—whether these be food, clothing, cars, household goods, telephones or books.

Much of the argument by those who don't like this approach to defining the subject matter of economics is concentrated on its lack of precision. To give one illustration: what makes us think we are better off if more of us have refrigerators and motor cars? Can we prove it and measure it? Few people are really worried by these questions. I am content, for the purpose of this address, to state that economists can and do concern themselves usefully with what makes our national and individual income more or less. They accept as a practical working premise that people really believe that our living standards or material welfare are improved by rising incomes. Moreover, they accept as a national economic objective that people want national and individual incomes to grow as a result of developing our resources more and more efficiently.

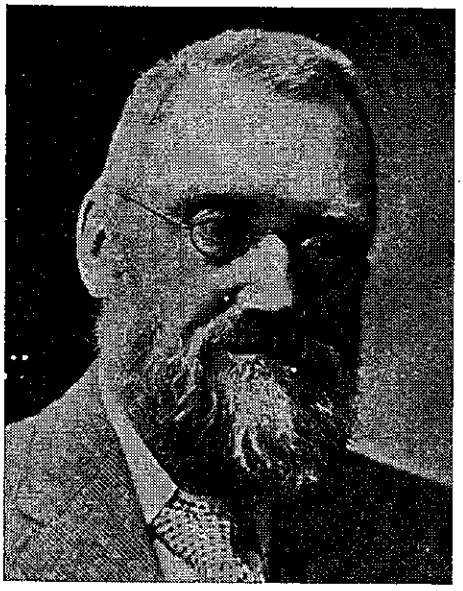
"Alternative Uses"

Yet there is another very useful approach to economics which in its extreme form rejects the welfare approach. I am not concerned with it in the extreme, but rather for the striking and important principle it enunciates. The principle arises because we do not—not even the Americans—have enough resources to satisfy all our wants.

[2] Alfred Marshall—"Principles of Economics", p. 1.

It follows—as a farmer will readily understand—that if we use a resource, like land, for one thing we cannot use it for something else at the same time. Likewise if we build a school, the same bricks and timber cannot be used for building a factory. There are many things we want to do—the means for doing them are normally scarce, although the means often lend themselves to more than one use. From this approach economics becomes "the study of human behaviour as a relationship between a multiplicity of ends and scarce means that have alternative uses".[3]

William James Farrer
—1845-1906—



Son of an English farmer, Farrer came to Australia in 1870, and was a surveyor on the staff of the N.S.W. Lands Department. In 1898 he was appointed to the staff of the Department of Agriculture following the recognition of the value of his experiments with wheat. For his work as a wheat breeder, Farrer has been termed "Australia's greatest benefactor", pioneering the development of varieties suitable to Australia and making possible the extension of our wheat-growing areas by millions of acres.

This principle—the necessity to choose between alternative uses of the same resources—is basic to much in our national economic life as we can readily understand by reference to two or three simple illustrations.

First we are faced with it—especially under full employment conditions—in the choice between defence and "opulence"[4] or guns and butter in more modern vernacular. If, for example, we devote 5 per cent. of our capital and labour to making fighter planes and atom bombs we cannot use those resources for the ordinary things which make up our daily living standard. This may be right—a matter not for the economist, but for others to decide.

I suspect, however, we are now more familiar with this problem of choice in national economic policies. Whenever inflation is rife, it is a sure sign that people are competing for scarce resources somewhere. Mostly, in Australia, it has been competition for labour and materials which are not plentiful enough for all the investment people want to start—whether on the farm, new factories, new roads, schools, hospitals or housing. Inflation is a sign we are trying to go places too fast by making excessive demands on our resources, so forcing wages and other costs up.

Problem of Choice

A particular form of this problem of choice is seen in the way public investment is financed in this country. We are prone to want our cake and eat it too. In the mass, we want adequate housing, schools, hospitals, better roads, railways, power for homes and industry—all requiring public works. Yet we don't like—or not enough of us like—financing these things by lending to governments out of our incomes by investing in government bonds: we prefer to spend on other things if we can. Many of us lose out in practice because we find that the Commonwealth and State governments feel obliged to maintain higher taxation than would be necessary if we lent the money instead! Budget surpluses find their way into public works as a direct means of

[3] Lionel Robbins: Essay on the Nature and Significance of Economic Science.

[4] The use of the word "opulence" derives from Adam Smith, who not only recognized in his "Wealth of Nations" that resources could be diverted from "opulence" (wealth) to defence, but declared that defence was more important. Most economists today leave that judgment to the chosen (elected) of the people.

replacing the deficiency in public loans. In 1955-56 taxation provided £295m. towards the total gross public investment of £450m. In this way the Government, rightly or wrongly, makes a choice in the national use of our resources—it insists on so much public investment, borrowing from and taxing us—leaving us to allocate the rest of our income more or less as we wish.

So economics can be regarded as a study of the business of being better or worse off in material welfare, or it can be regarded as a study of how we go about the business of deciding how to allocate the use of our resources of land, labour and capital—knowing that our resources won't do everything we want at the one time, so forcing a continual act of choice on us.[5]

The two approaches can be married. For our real objective as a people is to build up our resources of capital and make our land more fertile so that we can—using them to the limit of our labour resources in numbers and skill—increase the nation's wealth and the average income of all of us. In other words, economics is a study of the production, exchange, and distribution of goods and services in the course of which we use up our resources of land, labour and capital—and often borrow from our friends as well.

Economic Thinking

Now for a few remarks on the method of economic thinking, and some of its difficulties—especially in comparison with the physical sciences—and on the need for continually testing theory against historical and current evidence from the real world.

The method of thinking in economics is the normal method of science: accurate observation of the data or facts about the working of our economic system accompanied by attempts to formulate general principles—sometimes called "laws"—which seem to fit the facts.

Thus under the "laws" of supply and demand which are what many people regard as economics, prices ought to fall if supply exceeds what people wish to buy at the going price. Economists have shown this is right under certain conditions—when a large number of sellers handling an identical product are confronted by a large number of buyers. This is true competition and it fits much agricultural marketing practice. But the "law" may not operate so readily if monopoly holders operate or if there are only one or two buyers. The wool markets are pretty competitive; but sometimes strong holders of wheat—like Americans, Canadians and Australian wheat authorities—have managed to prevent prices falling as fast or as far as the "law" of supply and demand under the more fully competitive conditions prevailing pre-war might suggest.

Take another homely illustration: by all the usual laws of economics farmers should produce less if prices for butter and wheat fall. Experience, especially in depression, shows that the reverse is sometimes true—the farmer may produce more to try to make up for the lower price. And, indeed, it may be good economic sense. Conversely, under the "law" of supply and demand, rising prices ought to lead to higher production. But the farmer doesn't always respond: this is often because he prefers leisure to the extra income, and extra income tax, or perhaps to the difficulty of getting labour and materials needed.

Difficulties

It follows from what I have said that the economist, in spinning his theories, ought to be reasoning from his observations of the functioning of the real world about him. Sometimes his theories just don't fit the facts; sometimes they fit some of the facts but "other things are not equal". I will illustrate this in a moment, but before I suggest—or admit—that the economist has his limitations, let me mention one or two difficulties which characterise economics.

In the first place, the economist cannot work in a laboratory like a chemist: he cannot—like an agricultural scientist—have a controlled experiment, supplementing the laboratory with field plots, to test under what exact conditions his "laws" or generalisations hold true. The economist is dependent upon a growing and increasingly accurate knowledge of how people do behave in their economic affairs in a variety

[5] Clearly if there were no problem of choice—if resources were not scarce in relation to our "wants"—all goods would be as free as the air.

of situations like conditions of unemployment, overfull employment, falling export returns, monopoly and so forth and so on.

The range of economic conditions and economic behaviour is terribly wide: have sympathy with the economist as he seeks to make order out of it all. Adam Smith found an "invisible hand" more or less inevitably working for our total and individual welfare. Economists to-day are more sceptical and try to find tangible causes of booms and depressions, inflation and deflation, collapses in wheat markets and the host of vexatious matters which fall to his lot to study.

All this suggests that economic theory can be very difficult. And, indeed, this is right. William Farrer found his plant breeding experiments difficult—there were so many variables to control in trying to eliminate all but the desired qualities. In economic thinking we can only eliminate the vagaries of human behaviour at the risk of being wrong. As our knowledge of economic organization grows we are able to take some of the element of chance out of economics—but great room for error remains. This is one reason why economists sometimes envy the natural scientists.

Halley in the 18th century was able, using Newtonian physics, to predict the return of a comet named after him. This was because broadly stars and planets stay in their course and behave in accordance with deduced laws. Unfortunately the stars for the economist do not so firmly stay in their courses. His variables—human behaviour, non-human factors like climate and, not least, scientific knowledge—are changeable indeed to the point of being frequently quite unpredictable in their economic effects.

Malthus's Theory

A classic illustration is to be found in the theory of the relation between population and land resources. Thus in 1798 Rev. Thos. Malthus, an important economist of the time, forecast vice, misery and famine because of the pressure of growing population on land resources. Malthus's conclusions basically rested on the "law" of diminishing returns which for him meant that a less than proportionate return would result from additional application of resources to a relatively fixed amount of arable land. Populations have grown enormously in the last 150 years—yet disaster has been held at bay. What did Malthus overlook? Simply that agricultural science and the technological revolution between them would enable us to produce more and more food from our land.[6]

The economist who predicts dogmatically runs a good chance of looking foolish. He can agree with Shakespeare: "What's to come is still unsure". Yet predict he must to be most useful. He must try to indicate the likely order of economic results of this or that course of action—whether it be immigration or credit policy in the national scene or expanding production of wool or wheat at the farm level. He will do his best by continually checking his theory against fact. To take a simple illustration which I will expand later: I can readily show that if U.S.A., Europe and the United Kingdom didn't subsidize their agriculture Australia would probably have a vastly expanded market opportunity because of our comparative advantage as a wheat producer. Yet I am cautious in predicting this vast market because realism suggests that these countries will not readily abandon these policies.

Sense and Training

I hope what I am saying sounds common sense. Yet, since economic behaviour and institutions are so complex there need be no surprise that economic analysis can be very complex and difficult too. Plain common sense is highly important: but without training it will not as a rule be enough. Common sense doesn't automatically give one a knowledge of national income measurement, terms of trade, over-valued currencies, inflationary gap, investment problems, effects of rising interest rates, conditions under which banks can or cannot create credit and so on. "Yet," says Robbins,[7] "it is upon knowledge of just such things as

[6] Not least important in winning this battle were men like William Farrer who so greatly helped to make a wheat industry possible in semi-arid Australia. Yet once the march of science and the methods of trade fail to keep pace with population increase, his gloomy disciples may bring Malthus into his own.

[7] "The Economist in the Twentieth Century," page 11.

these that economic survival or disaster may depend. It is a big responsibility for the professional economist."

Within limits, therefore, the economist has a right to use statistical methods, mathematics and argument so difficult as frequently to be beyond the powers of the ordinarily curious and intelligent person if he lacks the basic training in economic theory. If I were to talk to you to-day about demand and supply curves, input/output analysis, marginal analysis, indifference curves and all the other analytical tools found in a modern text book on economics, you would perhaps listen less courteously. Yet I might be in fact talking usefully. We would be less likely to object to a physicist if he started giving us the theory of physics governing fusion and fission and the generation of energy. Very few of us would understand him, but we would accept it as highly probable that he knew something about atomic energy. The truth is that modern economic theory needs its translators into everyday English just as the natural sciences need theirs—perhaps even more so—for economics enters more intimately into the daily lives of every person.

Keynes' View

The most influential of the modern economists, Lord Keynes, has well summed up the method of economics: "The theory of economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps its possessor to draw correct conclusions.[8]

I rather think this understates the number of ready to hand conclusions which do exist. For, thanks to Keynes and many others, it is now a fact that economists—with the aid of difficult analysis—do know a great real about how our economic system works, what makes us allocate our resources for this and that use, what makes prices move up and down, how higher export incomes spread through the community, how to increase employment or how to curb inflation.

I now wish to turn to some particular illustrations of economic theories which seem to me to have bearing on the agricultural economy of Australia. My problem of choice was exceedingly difficult[9] for, in fact, no national economic problem is irrelevant, no theory in economics is without some significance for agriculture. Inflation, balance of payments, credit policy, behaviour of monopolists, European "free trade" proposals, the Ottawa Agreement (now happily revised), the controversial treaty with Japan, tariff protection in Australia—all have interest and importance to our farming economy. I have torn up much paper and finally resolved to talk about five things:—

(*a*) The theory of comparative advantage in international trade;
(*b*) Engel's "law";
(*c*) Wool;
(*d*) Wheat;
(*e*) The test of profitability in farm management.

An odd assortment[10] perhaps; but not so unrelated as you may now think. I abandon any hope or expectation of giving you a knowledge of economics in one easy lesson., I dare to cherish the notion that I can possibly say one or two interesting things on these selected items out of my experience as an economist who has practised largely in the application of economics to agricultural production and marketing problems.

National Objectives

I preface my remarks on these matters by a short statement of national objectives, which I accept for working purposes, and a national need which I am satisfied flows from these objectives.

Very few people will disagree with the commonly accepted objectives of Australian national policies: rising population (including a high rate of immigration), rising living standards (i.e., increased income per head), full employment, rapid development of our

[8] General introduction to the Cambridge Economic Handbook.

[9] An economic exercise if you wish—the allocation of a scarce factor, *time*, to a limited number out of boundless possibilities.

[10] With a possible advantage that they are probably a little off the beaten track of topics for the Hawkesbury congress.

resources—all to be achieved in a framework of a democratic political system.

You will agree that it is not for the economist to say we must have these things —these are questions for parliament and the executive. The economist can only advise on ways and means and possible conflict among the objectives. There is no economic "law" which says full employment is a good or bad thing in itself. The economist can, however, clearly demonstrate that national income will be increased if all our labour is fully—but not "overfully"—used and he can advise on the steps necessary to achieve and maintain full employment.

Out of all these objectives I am satisfied on one national need—steadily increasing exports—if they are to be realised. As a corollary, for reasons I haven't time to argue, I am satisfied that agriculture must continue to supply the bulk (although on a slowly reducing percentage basis, I believe) of our exports. Without increasing exports (or the continued good luck of exceptionally good wool prices) balance of payments crises, and even import restrictions, may be a recurring fate.

Against this background the principle—I hardly call it a "law"—of comparative advantage has great importance. This theory states that "each country specializes in the commodity in which it is relatively most efficient."[11] The comparative advantage or relative efficiency will arise from the nature of resources (e.g., land, minerals and climate) available to a country, as well as the skills and numbers of its people, possibility of large-scale production, distances from markets, stability of government, and so on.

The economist can show—given perfect competition, full employment in the countries concerned, and the absence of trade barriers, such as tariffs, quotas, currency restrictions, export subsidies—that even a country which has an absolute advantage in the production of a number of goods compared with another will benefit, and total output will be increased, if it specialises in the production of those goods in which it enjoys the greatest comparative or relative advantage. In short, "a nation gains by producing what it is best fitted to produce, and exchanging its products for those of other countries".[12]

Sound Doctrine.

This is sound doctrine—it fully justifies the production of wool, wheat, meat, milk products and other primary products, minerals, steel and many steel products in Australia, for in these products we are relatively more efficient than a great many countries. As our economy grows it justifies the prospect of manufacturing exports to Asia because of our nearness to those markets. Yet the doctrine must be handled with care: the assumptions on which it rests can be upset. Take wheat, for example: our comparative advantage as a low cost producer is offset (and deliberately so[13]) by domestic wheat subsidies in the United Kingdom, domestic and export subsidies in France, and the same plus special disposal schemes in the United States. It speaks well for the comparative efficiency of our wheat industry that it still thrives and has a future! On the other hand, our comparative advantage in wool is not only clear-cut but is open to less obstruction in world marketing. There are, of course, very important policy inferences to be drawn here as I will comment later.

However, do not let us pretend to have all the virtues, for we share the common belief—in my view rightly—that a moderate tariff is a good way to get industries started on the way to maturity in a young country. But this theory does enable us to say that we cannot play the game both ways. We must be reasonable if we wish to reduce

---

[11] Samuelson: Economics, 1st edition, p. 549. Notice that the principle holds as between areas within a country and can be generalised as done by John D. Black (Introduction to Economics for Agriculture, p. 140): "A product tends to be produced by those persons or areas whose ratio of advantage is highest". A simple case is found in sheep raising in some areas while steel is located at Newcastle and Port Kembla.

[12] Robinson, Morton, Calderwood: Economic Reasoning, p. 264. I have not tried to demonstrate the validity of the law. To the listener or reader of this address, it may be sufficient to indicate its probable common sense by reference to the fact that trade does take place—our wool is sold and we buy capital goods that we would find too costly to make. Its validity is also indicated by the strenuous efforts made by many countries to upset it—by the use of high tariffs, embargoes and export subsidies.

[13] Not for anti-Australian motives but for reasons of national, political and economic policy in each case.

obstruction to our own trade. It is in this light that the recent revision of the Ottawa Agreement and the new Japanese Trade Treaty must be understood. Both are means to an end—the development of the maximum opportunity for marketing the products for which we have natural advantage. Reducing excessive preferences enables us to offer better trading terms to other countries in return for better market opportunities with them. The Japanese Treaty gives us assured entry into a "natural" market for our goods in return for no more than opportunity to compete on more equitable terms with other suppliers.

Engel's Law

Something of the same order of conclusion is reached if we look at Engel's "law". This law is attributed to a Prussian statistician who in 1857 made some family budgetary studies with results which have been amply confirmed by many other investigations since.

Broadly, these studies demonstrate that as the income of a family increases more money is spent on food—but the extra expenditure is a decreasing proportion of the increased income. Likewise, as income rises people give preference to more expensive foods like meat, vegetables, fruit, milk: they may, in fact, actually reduce expenditure on the basic foodstuffs like wheat or rice products.

On non-food items like clothing, expenditure out of rising incomes increases more than proportionately to food, and so on, up the scale of luxuries. Without the benefit of budget studies Adam Smith saw this clearly enough in 1776: "The desire for food is limited in every man by the narrow capacity of the human stomach; but the desire for conveniences and ornaments of building, dress, equipage and household furniture seem to have no certain boundary."[14] When we think of T.V. and motor cars we can agree with Professor Cannan who commented on this passage over twenty years ago: "In the 160 years since his (Smith's) time we have discovered many wants which are even more elastic than those which he thought of, and the human stomach is no wider, though the tongue may be a little more dainty."[15]

From this we can infer, "other things being equal", that if population remains unchanged and incomes rise, some of our products are likely to find extra markets more quickly than others—wool more than wheat, for example.

However, this "law", although very important, is not a complete story. "Other things" are not equal. For example, population is not static. Food in all forms remains in increasing demand because numbers are growing especially in low income areas where expenditure on food remains a major proportion of income. Clothing fibres are the fortunate beneficiaries of both rising incomes and growing population,[16] although they won't benefit very much in very low income areas until incomes do in fact rise.

Out of all this three lessons can be derived of major importance for Australia. We must study our markets, trying to disentangle income and population effects in projecting our production thinking. In studying these factors we must keep an eye on the obstructions to the full operation of comparative advantage—like the agricultural subsidies in Europe already noted.

Finally, we must learn and take to heart that there is no magic market in Asia for us; we will get the benefits of rising population and incomes there only if these countries get capital and trade opportunities with which to develop industries in support of their population.

These simple facts underlie the importance —to the wheat and dairy farmer, as well as wool grower and manufacturer—of the Colombo Plan, World Bank, U.S. Point IV, Trade Treaty with Japan and other means of developing Asian economies.

It is pretty safe to argue that Australia has a comparative advantage in the production of wool and wheat. Out of our brief account of the principle of comparative advantage and Engel's "law" and of the factors limiting their operation let me say a few things about wool and wheat production policy.

---

[14] "Wealth of Nations" (Modern Library "Cannan" Edition), page 164.

[15] Economic Journal, Sept., 1933.

[16] With complications introduced by the dictates of climate.

Expansion Right Policy for Wool Industry

Wool is an excellent case where economic theory and the facts go pretty well hand in hand.[17] Here and there the tariff is high but there are remarkably few serious obstructions to trade in raw wool and tops. Whether I speak as economist or as administrator advising the Government on policy I say without serious qualification that the right policy both for Australia and the wool industry has been and still is an expansionist one.

We have been fortunate in the combination of good prices, good seasons, rabbit control and pasture development which have made the tremendous upsurge in production possible. To-day the total clip is probably in excess of 5 million bales compared with about 3¼ million just before the war and an average of 4.2 million bales for the three years ended 1954-55. Exports during 1956-57 were in the vicinity of 4.6 million bales compared with 3.9 million bales in 1955-56 and 2.9 million bales in 1938-39.[18]

I hardly need argue that we have a striking comparative advantage in wool production—especially quality wool. The industry is one fitted by its production structure to weather price cycles better than most of our primary industries. Field survey evidence clearly indicates a cost structure able to meet downward price pressure when it comes. In fact I am possibly more worried by price booms than falling prices—although I am not foolish enough to ignore the likelihood too of periodic (although irregular) seasonal setbacks to the upward trend in production.

Altogether the economic position of the wool industry—thanks to science, keen and imaginative producers, and relatively low day to day operating costs—is so solid that a further large increase in the Australian clip over the next decade would not frighten me—even if another million bales were added. This, because total textile fibre consumption is increasing and because wool's share has been declining for lack of supply, would barely help wool retain its share at about 10 per cent. of total fibre usage. (I am counting on wool production increasing in other countries too.) This could be all to the good. An increasing supply may prevent erratic price booms which more than anything else encourage the use of substitutes.

Substitutes are the one major threat to wool never to be ignored but not to be treated with defeatism. Stable or even gently declining prices (relatively to general prices) is one factor in competing with substitutes. The other is research to widen the appeal and cheapen the costs of producing and of processing wool. On research the results to date are good and I feel confident about the future. As an economist, I admit, I can't find any basis for certainty. I can only reason from experience to date and this leaves me confident.

Frankly I look to wool to provide a major share of growing export receipts. This presupposes that the clip will increase and here indeed is a real job for the agricultural economist. It is his task to show under what conditions of price and cost it will pay producers to invest more capital in pasture improvement and other aids to wool production. For unless expansion is profitable it will not readily occur. But more of this later.

Wheat Markets

On wheat one must perhaps be more qualified but not defeatist. Defeatism would, indeed, be a poor outcome of Farrer's efforts and those of the other great scientists—especially in this State—who have followed in his footsteps. Yet Farrer would urge objectivity, not emotionalism about the subject. So let us attempt a little clear thinking.

Wheat is one product for which the human stomach sets a limit. Yet as already noted, the number of stomachs is growing in Asia and Japan, areas in which our markets can be expected to grow if their economic expansion is not frustrated for lack of capital and trading opportunities.

Sir John Teasdale has quite fairly drawn our attention to the manifold marketing difficulties which confront us to-day. I have

---

[17] Here I have largely repeated a statement made in the course of the address to the Agricultural Economics Association in Sydney in February last. I have used data kindly provided by Mr. G. O. Gutman of the Bureau of Agricultural Economics in drawing this conclusion.

[18] Export figures cover greasy, scoured, slipe and carbonised wool only.

mentioned most of them already: U.S. surplus disposals, especially in India and Indonesia, subsidies in Europe, United Kingdom home subsidies, French flour subsidies and the growing difficulty of covering costs on the export market. Out of all this he sees a total market for, say, 150 million bushels—an average production of, say, 165 million bushels. I would have been happier with another 10 to 15 million bushels at least for I still think we can find export markets for no less than 100 to 105 million bushels year in year out. In any case—even on Sir John's figures, the wheat acreage has fallen perilously low.

Marketing is difficult: I do not deny this. But let us throw some other weights into the scales. Europe—because of subsidies and barter deals—is our tightest market. Fortunately, improved quality and good farming go together—as Sir John rightly reminds us so frequently.

Again Sir John speaks as though the Americans and French have pushed us out of major markets. Their heavy subsidy policies have certainly done us damage, but it is exaggeration to suggest we are backing "lost causes". We are still very much alive in Asian markets, have substantially restored lost ground in the United Kingdom, and now have a wonderful opportunity—both for soft and semi-hard wheats in Japan. Surely this is good fighting?

Again I do not have to tell you that we can have a drought with its extra demands on wheat for feed. For this reason and because, to hold markets we must always have wheat to supply[19], I would be unhappy to see our carryover fall below 40 to 50 million bushels. We now have storage to cope.

With all these things in mind my personal judgment is in favour of an acreage which would yield an average over the years a total crop nearer 175 million to 180 million bushels than to Sir John's 165 million. This won't require an acreage of pre-war dimensions (over 13 million) but it does require something better than 10 million and possibly better than 11 million. Let us hope last year's record low acreage was an accident arising from an over wet season. In the light of the developments of ley farming and the relatively profitable wool prices, it may be difficult to recover the acreage—hardly a setting for further talk of reducing the acreage under wheat. I am rash enough to believe that given assured returns, the profitability of mixed wheat and sheep farming and the further opportunity for acreage expansion of high protein wheats in northern New South Wales and Queensland, the acreage can profitably recover. In terms of national objectives of high export income, I still see room for it.

F.A.Q. Policy

However, I have not done with wheat. For perhaps the biggest controversy ahead of us relates to suggestions that the time has come to review our f.a.q. policy. The pressure comes from two sides—buyers interested in our higher protein wheat, claiming that modern mechanical baking calls for it, and growers in large areas of New South Wales, Queensland and other States too who can grow the harder, higher protein yielding wheats and who seek premiums some buyers are willing to pay.

How the controversy would have interested Farrer—probably delighted him! Here we find the very wheats he was after—high yielding, high protein and rust resistant. Do they call for a new marketing system?

At Gunnedah some months ago[20] I said the case for modifying the f.a.q. system was not yet proven, but that there was a very strong *prima facie* case for experimenting with modest changes where it was practicable to do so. I had the temerity to observe that some of our wheat was already being sold to protein specification. I have been severely taken to task by some but remain quite unrepentant.

All I ask for is some of Farrer's objectivity in dealing with the problem which is so very largely an economic one. What is wanted is a balancing of prospective costs and rewards if the f.a.q. system is modified. In the end, whatever the controversy now, changes will come if market trends continue to favour the stronger wheats and if we grow more and more of them.

---

[19] A point West Germany has effectively made against us in recent years, arguing that she has turned to special deals with Sweden, France and Argentine at our expense because we couldn't or wouldn't supply when she was willing to buy.

[20] "Wheat and Flour Convention," April, 1956.

Enough on wheat. Admittedly I have said nothing about stabilisation which I take for granted, or costs which I believe are "sub judice". I have, however, taken a stand on three points:—

(*a*) The market situation is difficult but does not justify defeatism—although it requires all the Board's promotional efforts and inter-governmental negotiations backed by quality wheat production. We still have an important comparative advantage.

(*b*) Acreage needs to recover beyond 10 million acres if Sir John Teasdale's modest requirements (10 million bushels or more below mine) are not to be endangered—unless growers are now confident of yields year in year out even higher than 15 bushels per acre?

(*c*) There is need for an objective, not emotional, examination of the present marketing system to establish whether changes would be economically profitable or mechanically feasible. Surely a good project for the industry to consider when allocating its funds for research?[21]

Individual Decision

I have carefully left the decision whether to grow more wheat or not in the hands of the individual farmer. Let me now turn for my final few minutes to this question of individual economic decisions.

No matter how much a Federal or State Government may shape the economic pattern of the country, successful economic policies still largely rest on the decision of individuals. We will, for example, expand our exports only if individuals are convinced that it pays them to do so. (An exception operates in times of patriotic stress.) William Farrer found that soft, high-yielding wheats attracted farmers more than hard, low-yielding varieties. To-day when high yields and hardness can go together farmers will grow the better variety—it has become profitable to do so. Hence what economists have to say on profitability may be of very great importance.

I will confine my remarks to two apparently unrelated but in reality closely linked questions:—

(*a*) Are there ways of checking whether a particular farm plan is the most profitable open to the farmer?

(*b*) If farm leaders say produce less or more of this or that, how can the individual farmer respond?

If we ignore the case of a new farm being opened on virgin land, we can assume that most farms do have a more or less established pattern of land use. For example, a farm may run a wheat, oats, fallow, rotation and carry 600 sheep. The question before us is whether this is the most profitable combination of resources. Sometimes the possible change is very limited—just a little more of this (a few cattle) and a little less of that (e.g., less wheat, more pasture). Sometimes the change can profitably be right over to an entirely different basis—e.g., out of wheat as a cash crop over to a feed crop—pasture—livestock combination.

In my comment I am assuming that soil fertility will be maintained and that the skill and capital required for any change are available. Both are important problems beyond my resources of time to-day. My proposition is simply that in considering possible farm changes, how can the test of profitability be best applied?

In applying the test of profitability we use one of the most fundamental tools in economic analysis. This is the concept of the "margin", both on the costs and income side of the farm accounts. As already indicated most farms have an already established farm or land use pattern. Their practical interest will be in, for example, the results of modifying the pattern to do more of one thing (e.g., wheat) and perhaps a little less of another (e.g., stocking). The change will be at the "margin" of his operations. The simple test in this case will be: are the extra or "marginal" costs of the proposed change covered by the prospective extra or "marginal" returns?[22] If the extra returns exceed the extra costs, the proposal will be profitable.

For example, let us suppose a farmer turns 100 acres of pasture into wheat making his total wheat 400 acres instead of 300. The costs will include the possible reduction in stocking rate as well as costs of preparing land, sowing and cropping, includ-

[21] Compare my recent advocacy that the dairy industry spend money investigating its own affairs (George Howey Oration).

[22] Ignoring the possibility that a proposal may even reduce total costs. The test is still the same, will the net income be increased?

ing a reasonable allowance for extra depreciation involved. Let us say the net extra cost is £8 per acre with the prospective yield 20 bushels per acre at a return of 10s. at the farm. The return of £10 will exceed costs by £2. Marginal revenue has exceeded marginal costs and the proposal is profitable. You will notice that it has not been necessary in this case to know the costing situation in the rest of the farm: sufficient to know that the proposed action will increase net farm income.[23]

But this is only one step, the farmer is entitled to ask, "Is this the best single adjustment I can make? Wouldn't some other modification of my farm practice give me even better results?" The question is not only proper but it is the one most farmers are continually asking themselves. The test is still the same: "Will added revenue exceed added costs?" or more generally, "Will the change increase my net income?"[24] He may examine several proposals and adopt that which promises to be most profitable[25] or, in the jargon, "That combination of his resources which will maximise his net income."

This leads to a quite general proposition: a farmer, like one in any other productive enterprise, will seek the most profitable combination of all his resources of land, labour and capital. This will still be true even if some elements like land and his supply of capital are fixed in total. He will still look for the most profitable use. In theory he would finish up satisfied only at the point when any change in any of the factors: a little less wheat and a little more linseed, or another machine will add more to his costs than will be added to income. That is, any change at the margin will be unprofitable.[26]

Applying Theories

Now life—certainly farming life—is not as simple, or its business processes so minutely divisible, as this theory suggests. The test of profitability is the test, but applying it is a matter of making concessions to practical circumstances which frequently force the adoption of rule of thumb methods. In the first place, changes in farm practice are frequently "lumpy". That is, many profitable changes require a quite big change in capital investment or re-arrangement of the farm. The concept of small changes at the "margin" is pretty heavily stretched. Yet the test of profitability is still applicable.

Secondly—and this is important—time is a factor. The prospective returns from a given investment may fall short of costs for a period, but the investment may still be profitable. Farmers tend to discount future returns too much. Thus a substantial farm re-arrangement (like extensive pasture improvement) may require some years of waiting before extra income is earned. It may still be the best because most profitable combination of resources.[27] Officers of the New South Wales Department of Agriculture have done excellent work in this field: work which deserves very wide study by farmers, graziers and farm educational organisations. It has particular relevance to what I have said about wool.

Thirdly, to apply the test of profitability —whatever the mechanism of applying it— requires assumptions about price and yield (income) expectations. It is best to be conservative in these things; but even here there is great room for farm management advisory data to enable farmers to make reasonable judgments.

---

[23] An important conclusion can be drawn, however, if the rest of the cost situation is known. Let us assume that a dairy farmer running 40 cows is producing 9,000 lb. butter fat at 4s. 6d. per lb. average cost. He now adds 10 cows which, let us argue, do not call for extra hands or yards—but only more feed. The extra 2,250 lb. butter fat he may now get may cost only 2s. a lb. butter in additional cost. The "marginal" cost is lower than the original average. The *average* cost for total production now falls from 4s. to about 3s. 7d. a lb.—a very decided improvement in the total farm position which is now far more competitive.

[24] See footnote on previous page covering case where change may reduce total costs.

[25] If it is a case of a question whether to invest extra capital in a farm—the result may be profitable but not as profitable as off the farm investment. This is beyond the scope of this address.

[26] Under perfect competition this is the point of equi-marginal return at which, say £100 invested *in any way* differently from the plan adopted would result in a smaller total profit.

[27] Still assuming conservation of such fertility. On this general point see Heady: "Basic Logic in Farm and Home Planning in Extension Education". Journal of Farm Economics, Feb., 1956, p. 80.

When it comes to methods of making the profitability test the economist can offer you anything from simple or partial budgets to so-called linear programming which is a mathematical device designed to pick out in one major calculating operation the best programme out of a number of possibilities.

Budgeting

Most farmers will be content with the simple budget approach: show the cost of a proposal on one side and the prospective income on the other. This is a "partial" budget dealing only with the particular proposal and not the farm as a whole. It is necessary to try out more than one budget if more than one proposal is to be tested. Clearly the more complicated and the more numerous the proposals, the more wearying the task of budget analysis. Economists have adapted from mathematics the linear programming method[28] designed to reduce the trial and error process involved in testing a series of budgets. It selects the uniquely best result from a number of possibilities fed into the calculation.

Do not misunderstand me: I do not condemn the rule of thumb farm budget. Most proposals for changing farm practice are fairly modest and the budget is a serviceable simple arithmetic technique for applying the profitability test—even if the uniquely most profitable combination is not found. A major step in farm management advisory work is to get it into wide use. In the hands of competent farm management advisers, whether Government officials or the private farm management services now coming into vogue[29] in Australia, the more complicated methods can be used—provided they are labelled "Handle with Care".

This brings me to my final two points—both well in keeping with my central theme. The first is to suggest the need for the closest link between the agricultural scientist and farm economist. What is agriculturally sound may not be economically profitable.[30] The test of profitability is something on which both can work together especially where, as in pasture development, some years may be required before a programme yields maximum profit. Both agricultural scientists and economists have the need for lucid common-sense translators of their frequently difficult techniques. Both need to be accepted with confidence by the farmers. It isn't true yet but must become true that the farm management economist has the same standing as his agricultural science partner in a common service: helping to make farming more profitable and therefore more efficient.

Reducing Production

My second and final point in this address is to suggest that economic theory in the shape of the profitability test gives a major lead for the individual's answer to the question: "Shall I reduce production?" It is one thing for farm leaders or even a government to advocate reduced production, say, of wheat or dairy produce. But which particular farmers are to do the reducing? Under extreme circumstances which, so far, Australia has only found in war, legislation to reduce wheat acreage, for example, may be necessary.[31] I do not advocate legislative control as an ordinary peace-time method[32] but as a reserve approach to be used only when our marketing ability proves completely unable to match output.

I am frankly sceptical of appeals by industry leaders to cut production unless they give some leads. Do they mean: if your costs are very high get out of wheat or dairying and try something else? Or do they mean all farmers should cut a little? If so, this is hardly very sensible.[33] No, I

---

[28] Used in wartime for planning the extremely complex problems of wartime shipping logistics.

[29] In successful practice in U.K and U.S.A. for many years. In U.S.A. especially, the depression gave a tremendous fillip to private enterprisers willing and able to advise on farm rehabilitation and improved farm practice. In addition Government agencies have done magnificent work in raising the management standard on small farms.

[30] For example, even in cases where land and trace elements are "dirt cheap", heavy costs of raising fertility must be examined.

[31] Conversely, of course, in time of war and in circumstances like 1952, Governments are entitled to appeal for extra production although not necessarily on an unprofitable basis.

[32] Perhaps this is the administrator speaking, not the economist as such.

[33] Professor J. N. Lewis has pointed out to me that voluntary reduction tends to be self-defeating. If initially successful in raising prices (which may be doubtful) it sets up premiums for non-co-operators virtually "cash-in" at the expense of the "suckers" (vernacular mine).

suggest that all farmers apply the test of profitability on conservative lines. Make conservative judgments about returns[34]—e.g., guaranteed price less freight, etc., for wheat, or first advance from the Equalisation Committee for butter—and then decide whether a little less or even a little more production or some other enterprise altogether will be the most profitable course in the circumstances. Only in this way have we any real prospect of discouraging high cost production and encouraging it where we ought to—on those farms where efficiency is greatest and costs are lowest.

If this approach should produce a quite unmanageable surplus of some product it will be time enough then—not before—to consider production control. Fortunately, unlike U.S.A. where costly subsidies have over-stimulated production, Australia has not yet been faced with an "unmanageable" peace-time marketing problem that hasn't been solved by drought (here or abroad), floods or self-interest on the part of producers. Marketing problems have sometimes reached the acute stage but so far as yet they have proved manageable without interfering with the individual producer's freedom to make his own decision. I rather imagine this is how the position will remain in the future.

Economic Theory

And so to the end of the matter. I have tried to show you that the economist has a field of study—a field very much related to the business of everyday living and embracing national as well as individual decisions and policies. He is just as capable of airy vapourings as anyone else; yet his serious work is capable of bearing fruit because it is so relevant to what most of us agree to call economic problems.

Economic theory is just as real as any other body of scientific theory and employs the same processes of thinking. Its task is in some respects more difficult than that of the natural scientist because no laboratory is readily available; it deals with the rather shifting sands of behaviour by institutions and individuals. Yet beneath the great number and complexity of the variables with which economics must deal there do lie broad generalisations or principles to be enunciated and which are capable of great practical use. Its work goes beyond the scope of even ordinary intelligent common sense—important as this element is in the final translation and application of economic theories to everyday economic decisions. In the final translation, in fact, economics turns out to be the orderly or systematic presentation of thought processes nations and individuals actually go through in making their business or economic welfare decisions.

As with every science, the worker in economics must work with integrity and shun the role of cheer-chaser. Marshall's stern and rather Biblical admonition went even further: "Students of social science must fear popular approval: evil is with them when all men speak well of them."[35] Popularity may make the economist suspicious; but unpopularity—a common lot—won't prove him right! As Pigou commented, the service of the student of economics "is to follow with constant mind the flying feet of truth".

Farrer has said much from which the economist can take heart. Said he in 1973,[36] "Those who affect to despise theory will do well to reflect that a function of theory is to examine the foundations of practice and by this manner to modify it and extend it advantageously."

Economists may well adopt this ideal of Farrer's not forgetting "that in the social studies the end of knowledge is action".[37] Economics will bear fruit if the work of its practitioners enables the nation the better to realise its economic objectives and enables the individual producer of goods to make more effective economic judgments in the use of his resources. An economist, working in the vast field which is his, is fortunate if he keeps this thought before him. For he can then in his own chosen corner of economics share the faith of Farrer who declared of his wheat work—despite the many frustrations and the scepticism which were so much his lot: "The faith that is in me that I am well on the high road to do something of substantial value for one of the most important productive industries of our country causes my work . . . to be very pleasant to me."[38]

[34] It is useless and impractical trying to respond to day-to-day fluctuations.
[35] Quoted Pigou: Essays in Economics, p. 83.
[36] Source of the quotation eludes me.
[37] Fraser: Economic Journal, Dec., 1932, p. 570.
[38] Archer Russell: William James Farrer, p. 79.

Reprinted from The Agricultural Gazette of New South Wales, Volume 68, pages 518-525, 582-587, 597.

Sydney: V. C. N. Blight, Acting Government Printer—1958