THE ORGANISATION OF AGRICULTURE

THE ALEXANDER PEDLER LECTURE
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BY

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By Sir Daniel Hall, F.R.S.

It used to be said that the greatest public benefactor was the man who could make two blades of grass grow where one grew before. Not so to-day, when the nations are considering agreements to restrict output and are even destroying the products of the soil. The man of science must take up an apologetic attitude at the present time with regard to agriculture. For two generations he has been entreated to make the land more productive and to reduce costs; but as an American professor of agriculture writes to me: "Ten million acres of cotton and some thousands of tobacco have been ploughed under. The latest move is the killing of some 5 million pigs weighing under 100 lb. and the slaughter of some 200,000 prospective mother sows. If this will bring national prosperity I have wasted my life". The man of science may be forgiven if he concludes that he is no longer wanted and may retire to his ivory tower, but whatever food for irony the world spectacle presents he will not be allowed to enjoy it in detachment, for if the deluge comes he will be swept down with the rest.

It is my subject this evening to enquire a little into the causes of the paradoxical situation: a situation that has so often been aggravated by the application of surface remedies. I will ask you first to remember that the agriculture of the world is predominantly a peasant industry. We have developed in such an exceptional fashion, for only 6·6 per cent. of the workers in Great Britain are engaged on the land, that we do not always realise how much we stand apart. But in France 41, in Germany 34, in Czecho-Slovakia 40, in Poland 76, in the United States 26 per cent. are so occupied. At the extremity of the scale in the East the proportion of the population engaged upon the land may rise to 80 and even in large districts in China to 90 per cent. Taken alone these figures do not tell the whole story; more significant is the fact that they are mostly made up of single-handed independent occupiers of land, employing only their own labour and that of their family. In all the European countries except Holland the independent holders of land outnumber the paid labourers. The size of the holding is immaterial; it may be only a few acres in Europe, or a square mile in Australia; the older the country the more it tends towards the minimum on which a family can maintain the standard of living prevailing in the country. British farming has moved farther than any other out of this primitive peasant organisation; in England and Wales

two-thirds of the cultivated land are occupied in farms of more than one hundred acres, on which the greater part of the labour is hired. There are over 300,000 farmers and more than 800,000 hired labourers. Averages mean nothing, but the typical English farm is one of some two or three hundred acres carrying half a dozen or so hired labourers. There are, of course, capitalist farms, often of large size, in all countries, as, for example, the great demesnes of Eastern Europe, though the whole trend of policies since the war has been to break these up into single family units. But even in the new countries like the United States, where we are accustomed to expect industrialisation in farming, the normal type of land occupation is the family farm—the capitalistic enterprise is the exception.

The essential character of this family farming is that it is directed towards obtaining a living from the soil rather than profits from a business. First of all the family has to be fed and even in part clothed; only the marginal production is for sale, and the cash requirements of the family to obtain the necessities of life and to meet taxation, etc. may be very small. Of course such definitions must not be interpreted absolutely; the family farm on the prairies may be a bare homestead raising only grain for sale and buying all its food. We may agree, however, that farming in its origin aimed at providing a home for the farmer, and that the greater part of the farming of the world has not developed far from that purpose. But side by side has grown up the system of farming for profit—the utilisation of land as a business like any other. We need not go into origins—the latifundia, the demesne farming of the lords of the manors or the great religious houses—but in England we see this change at work in the enclosures of the seventeenth and eighteenth centuries, whereby the growing industrial population was supplied with food. So grew up our system of small capitalist farms, a development which has been deferred in Europe by the comparatively late invasion of industrialism.

The advent of science has enormously strengthened the economic position of large-scale capitalist farming, particularly the recent progress in power machinery, of which the full effects have not yet been realised. Efficiency of production has advanced to a degree difficult of estimation, indeed were agriculture an industry like any other, governed only by the free play of competition in the pursuit of profits, the family farm would long ago have been displaced. But two opposing factors have been at work; in no old settled country is land a free commodity; custom, even law, tends to perpetuate the old divisions of the land, the capitalist can rarely buy an area for extensive farming as he can buy a factory site. Despite the increased use of machinery, manual labour is still a large factor in agricultural production; the capitalist has to pay for labour, but

the peasant does not count his long hours or the assistance of his wife and children. During the last few years the enormous fall in prices of agricultural produce as compared with wage rates has hit the capitalist farm harder than the peasant farm. Not long ago I was visiting a Californian fruit farm under irrigation, which, as far as I could judge, was as good an example of efficiency as one is likely to meet in an imperfect world, an undertaking too that seemed to be under no primary handicap of unsuitable site or design. Yet the management admitted that at current low prices they were losing money, whereas the little man on his 12–20 acres was still able to live.

A century ago the factory did not all at once displace the hand-loom, and in the case of agriculture the solitary worker has the additional advantage in the struggle that he is at least producing food for his family. But the final outcome cannot be in doubt; organisation with capital, power and science at command, in other words the machine, must win, provided that free competition is allowed to rule. Economic pressure will have its way, and under this pressure agriculture will by degrees be rationalised, like any other industry which stands or falls by the efficiency of its production, and efficiency mostly means turning human labour to its maximum account. It is indeed pretty clear that the malaise of European agriculture during the last two generations, and of world agriculture at the present day, represents in the main the difficulties of adjustment of the old system to the competition set up by extensive farming of the new lands on the one hand, and the advances of science in the old countries on the other.

In any other industry this economic pressure would have effected a reorganisation, but the majority of European countries have made the preservation of the peasant the first condition of their national policy. One may find many reasons of state for this determination to preserve in strength the agricultural population, such as national defence, health, political stability, etc. One need not discuss the validity of these arguments; it is patent that when half or more of the working population of any European country is living on the land, no statesman, still less no politician, can afford to let the peasants' status be gravely impaired. That great revolution in the tenure of so much English land—the conversion of the common fields into several holdings—was spread over many centuries; there were many protests at the loss of the commons and the decay of the yeomen, but the transition was gradual, and growing industry and commerce absorbed the men who were forced off the land. But the pace of change is so much greater nowadays; the social system could never have adjusted itself to the rapid displacement of the peasant that would have followed had the competition of the new world with the old been

unrestrained. Such has been the origin of the continental policies of ever-increasing protective duties in the effort to maintain internal prices at the level that would allow the peasants to maintain their traditional mode of life, duties that have often had to be increased fantastically to meet the great fall in prices. For example, during the last three or four years the price of wheat in France, Germany and Italy has been kept at two or three times the open market price such as was current in this country. I recall one occasion early in 1932 when wheat was 5*s.* 2*d.* per cwt. here, 14*s.* 6*d.* in Paris, 13*s.* 6*d.* in Berlin and 14*s.* in Milan. Moreover, since these protected prices have often been high enough to stimulate production until internal surpluses began to threaten prices, many of these States have embarked upon a further policy of bounties upon exports that would relieve the home market. Sometimes the bounties have been direct, sometimes indirect, such as cheap freight rates, assisted marketing, etc. France, indeed, after years of strenuous effort to increase the growth of wheat, now, as a party to the international agreement to restrict production, has had to resort to a new regulation imposing a heavy fine on any farmer who further adds to his wheat acreage. As Great Britain has been the great food-importing country, most of these assisted exports have been directed to our market, but even between continental countries cases can be enumerated of export bounties to countervail import duties. Indeed, the relative inefficiency of duties to keep out imports has become so well recognised that at the present time recourse is being had to quotas and other forms of absolute restriction. The sort of involved finance that follows may be illustrated by the dealings of Czecho-Slovakia with beet sugar. Czecho-Slovakia is a large producer of beet sugar, more than half of which has to be exported, chiefly to this country. In the last year for which I have information the internal price of sugar in Czecho-Slovakia was stabilised at 4¼*d.* per pound; an equal quantity was exported at a price enabling it to be sold here at 2½*d.* per pound, after paying duty at 1*d.* per pound. Since the war beet sugar has been unable to compete with cane sugar, because of the great advances in both acreage and methods of production which the cane sugar countries effected when they had the market to themselves. None the less the European countries have restored their areas under sugar beet to their pre-war acreage, thus creating a growing annual surplus of sugar in the world and an increasing accumulation of stocks, because at the same time the producing countries could not afford to sell sugar cheaply enough to expand consumption up to the rate of production. It is pretty clear that beet sugar can no longer maintain itself in open competition with cane sugar, but since it is the basis of so much continental agriculture and cannot be replaced by any general alternative

crop, most of the European States have set up fiscal conditions that will maintain the cultivation of sugar beet. Even the United States and Great Britain subsidise a beet sugar industry without consideration of its cost, if cost is to be measured by the price at which the bounty-fed sugar could be purchased from Java, Cuba and the West Indies.

We have then reached the position that the European State cannot afford to leave agriculture to its own resources. The pressure of competition induced by new countries, new processes, new machinery—by science, in short—has already become more than the slowly-moving farmer can adapt himself to. Let us not reproach the farmer on this account, because in farming there is inevitably such a lag between preparation and realisation, such wide fluctuations in production and prices from season to season, that it takes years to demonstrate whether or not a particular branch of the business has become permanently unremunerative. And even if the farmers do realise that a particular system can no longer stand up to external competition, rarely have they any power or opportunity to rationalise. The social structure, the system of land tenure, the lack of capital, may all offer almost impassable obstacles to change. It is no good telling a group of peasants that their way out is to throw a hundred of their farms into one enterprise cultivated by machinery. So the State has been driven to interfere and embark upon a policy of defence of the existing farmers and the existing methods. It is true that, as in another sphere, it soon becomes difficult to say whether the weapons employed are offensive or defensive, but I want to leave the question of international trade and consider only the internal effect of such policies as the State can adopt to assist its farmers.

Let us be clear that the policy the farmers desire and which is asked for by their representatives may not be that which is best for the country or even for the progress and stability of the farming community. At bottom farmers ask to be let alone, what they demand is the maintenance or the restoration of the conditions that enabled them in the past to make a living. (Probably of its own volition no industry sets out to cheapen its production or to transform its output.) For example, we have seen in Europe most nations employing various forms of fiscal assistance to increase the production of wheat. Yet of all agricultural commodities wheat is most appropriate to the big areas and extensive methods of the newer countries; Europe should encourage the more elaborate cultures and finer products. Similarly, we find that the general trend of agricultural opinion looks to reduction of output in order to generate a calculated scarcity that will enhance prices. The world, for example, is supposed to be labouring under a surplus of wheat, and an agreement has just been reached whereby each country will limit the amount of wheat

it will offer for sale. The assumption is that the demand for bread among the world's population is more than satisfied and cannot be increased, so that the only means of getting rid of the surplus that is breaking the market is to restrict production. But wheat is convertible into pigs or hens, and even if the general working population at present gets as much bread as it can eat, I am not aware that its appetite for eggs and bacon is equally satisfied. The output of particular commodities for which there is only a limited market has to be limited under any system of planned production. For example the Hop Board is forced to limit the amount of hops it will handle from each grower because there is but one outlet for hops—beer—and the amount of hops that can be so used is determined by the quantity of beer the attenuated pockets of the working man will stand for. Similarly, I have been informed that in South Africa the wine growers formed an organisation to handle all their output, an organisation which then was granted a monopoly and power to compel all growers to join. The co-operative organisation, by keeping inferior wine off the market and distilling it for brandy, succeeded in securing better prices all round, so much so that the output of wine was rapidly increased. This was all right until at length not only had the market for wine reached its limit, at least for the time, but the brandy market was also saturated, whereupon a limitation upon output had to be enforced.

It is argued sometimes that the characteristic of the demand for agricultural produce is its inelasticity. When a manufacturer cheapens an article he taps a wider market and so increases the demand, but no cheapening of bread will induce greater consumption of bread in a family that is living above the under-nourishment level. But this supposed inelasticity of the market for agricultural produce only holds for individual commodities, not for the output of agriculture as a whole. As a matter of observation the poorer the family, or the stratum of the community, or the nation under comparison, the greater is the actual consumption of bread and similar cereals, because they are the cheapest sources of energy. But as the family income increases some of the bread becomes exchanged for meat, milk, vegetables and fruit. The energy intake may remain unaltered, but food of higher quality is substituted for the cereals. I use the question-begging term of higher quality only in the sense of greater attractiveness to the mass of human consumers. But the point is that these goods do demand a greater output of energy, practically of human labour, to produce them, and therefore the total call upon the farming community and upon the land is increased with each exchange of cereals for the higher type of diet. Meat, milk, eggs and all animal products are made by the conversion of vegetable products grown from the soil, very largely from the cereals themselves, and the conversion

process is a wasteful one from the energy point of view. There is at least five times as much life-sustaining material in a pound of wheat or oats as in any meat or milk that can be made from it. So from any broad point of view the demand upon the agriculturist is indefinitely elastic, only limited by the money the consuming public has to spend on the food it likes.

But to return to my text—State organisation in some form has become inevitable, many branches of farming in this country would perish if they were not nursed. The question remains, what form shall the organisation take.

We have one example before us in the Russian plan. This represents what we might call an engineer's lay-out to obtain maximum efficiency of production from the land, given a perfectly clean sheet as to land, labour and capital, without any hampering conditions other than those imposed by soil and climate. It is the method of industrial exploitation such as we see at work in some of the great farms of the United States and of tropical countries, raised to a higher power, from thousands to millions of acres, by the all-controlling State organisation. Its aim is to secure from the soil the food and other raw materials required by the nation by the minimum employment of man power, made effective by the application of science and machinery, thus liberating the greater proportion of the labour hitherto so employed for other forms of production which will add to the real wealth of the community. It demands for its realisation a wealth of directive skill and a technique of national organisation, which only began to be attempted during the world war. It is irrelevant here to enquire what measure of success it has so far attained and what its ultimate prospects are. In so far as it aims at and indeed depends upon doing the work of agricultural production for the nation with perhaps 10 per cent. of the working population instead of the 30 to 70 per cent. now so employed in other European countries, it necessitates a social revolution which none of these countries is prepared to carry through.

What alternatives are there, methods that will give play to economic efficiency and yet be tender of the initiative and enterprise of the individual? Can we eventually transform the social structure of the countryside without beginning by breaking it? I hold that in the organisations that have been set up to bring the producers of each commodity into selling corporations we see the beginnings of such a system. It is perhaps not generally realised how fundamental a change in the conduct of the agricultural industry has been wrought by recent legislation. Provided that a certain proportion of the producers of a given commodity demonstrate their case to the Minister of Agriculture he can give to their

combination a monopoly of the right of sale; no producer outside the combination may sell to the public, all the members of the combination must sell through it. These powers of combination and control are to be extended to any intermediary manufacturing process intervening between the producer and the retailer; prices will be fixed and production regulated by the limitation the corporation will put on the amounts it will sell for each producer. The power to determine internal prices will ultimately depend on the regulation of the volume of imports and the duties that are to be imposed. The Government has undertaken to apply one or other of these measures as a necessary part of the new policy to stimulate home production. The object is to ensure stable prices, no longer subject to the devastating influence of foreign competition, often forced and illegitimate. In brief, producers and processors of any agricultural commodity can now form a guild, which will be endowed with a monopoly and directly or indirectly will exercise complete control of all production for sale. Moreover, this control will be exercised by the guild, not by any Department of State; though the Minister of Agriculture will yet retain an overriding power to nullify the monopoly by the free admission of foreign produce and the remission of duties. Provision is made for Consumers' Committees, who can investigate the conduct of the monopoly and make representations to the Minister.

The farmers must join the combination by registration and enter into contracts to produce at the prices offered, which contracts may be large or small according to the capacity of the farmer. The contract secures the farmer a reasonable profit under average working conditions, a better profit again for any greater skill on his part, but it will also bind him to turn out the standard article which the corporation can best market.

The organisation aims at removing the great criticism that can be levelled against the agricultural community, that its average practice is much below the performance of the best farmers. Who amongst us has not at times experienced a thrill of shame at finding the label 'English' expected to condone inferior meat, over-fat bacon, scabby apples and the like, when we know that the best of its kind can be or is being produced here by those who are putting their minds into their business. But in future if a farmer is to sell pigs at all he will have to forgo many of his preferences for particular breeds or methods of feeding, and to bring forward pigs that have been bred and fed on the lines laid down by the corporation, on instructions that are the outcome of knowledge and experiment. Hitherto such knowledge, in so far as research has made it available, has been left to permeate by means of advice, but the results have always been slow and imperfect because the economic advantage of the improved method is generally of an order that is easily obscured

by the accidentals of farming, especially as accurate recording has not been common practice. The individual farmer may by his methods have been getting for his pigs a shilling a score less than the standard prices, but he has rarely been in a position to know whether this shilling short was due to some fault of his own or merely to the turn of the market. But by the advice and instructions that farmers will thus get authoritatively from the corporation they will be led to work to rule and will become units in a great productive machine, though each man retains his own initiative and can expand or improve his output according to his skill and energy. Such a co-operative but controlled organisation is the only one I can see that can compete with the Russian plan of complete unification of the industry, and at the same time retain the essential freedom of the individual.

Such corporations will be able and, if they are to be acceptable, will have to enforce certain reformations in their particular industry which may not be of any great profit to the farming community but may be required by the consumers. To state one such case, it is possible to free the dairy herd of the country from bovine tuberculosis, which would not only mean greater safety to the health of the general population but would cheapen the production of milk by reducing one of the considerable items of cost—the relatively short life of the average dairy cow. But in so far as the milk producers as a body have to be paid for the costs of production, whatever they may be, no gain to them would accrue by the elimination of tuberculosis; the new cheapness would be passed on to the consumers. But the controlling corporation, which must consider the interests of the general public because from them it derives its monopoly and price-fixing power, can embark upon such a scheme. It can take the long view and adopt a scheme which despite its prime cost will ultimately both cheapen and improve the product.

It is, indeed, a necessary part of the new system, if these corporations are to become efficient elements of the national economy, that there should be some superior organisation planning and directing their work in the national interest. Otherwise the corporations may easily degenerate into guilds concerned only in maintaining a price level that will enable their members to carry on automatically on the old lines. It would be for this central body, personified in the Minister of Agriculture, to decide which branches of the agricultural business in this country should be encouraged to develop and which should be subjected to the brunt of economic pressure, whereby they would be either transformed or abandoned. To take an example, it is inevitable that there will be, in the future as in the past, strong pressure from an important section of farmers to maintain a remunerative price for wheat. Now while wheat

may be almost a necessary element in the current rotation on certain types of English soil, it should be regarded as a by-product rather than as the main object of the farming system, and in that old unspecialised farming it can hardly be produced at world prices. But again, on these soils—the arable lands of the East and West Midlands—it is possible to grow wheat as cheaply as in Canada or the other great wheat areas if the farming is mechanised and concentrated on cereals. It is reasonable in the general public interest to demand that what I might call the retail form of wheat growing should not be bolstered up, but that the effect of the world price should be allowed such play as would force men into a different use of the land or into a rationalised form of production. For our farming can and should pick and choose, specialising upon the higher grade products rather than on the primary commodities like wheat. Considering the ratio that our land fit for cultivation bears to our population, we cannot be self-supporting as regards food, except at fantastic cost or by reducing excessively the standard of living. It must not be supposed that questions of cost are negligible within a self-contained community, that for example it does not matter what price the British public pays for sugar grown here, provided that the money goes to British farmers and manufacturers. Every commodity has a real cost—the man-hours spent in producing one unit—and if we waste man-hours in producing directly that for which our soil and climate are unfitted there will be less of things in general to go round. We could for example grow the oranges we now import, but at a cost of labour and coal (labour again) many times as great as is now spent in making the goods which we exchange for oranges. The net result would be fewer oranges for the self-contained community. Indeed, we have to recognise that self-sufficiency for any nation, even the largest, must mean less of real wealth and a lower standard of living all round. We are definitely short of land for self-sufficiency in food. In Western agriculture, as at present carried on, two acres and upwards of land are employed in producing the food, etc. consumed by one unit of the population. Since in round figures the cultivated area in Great Britain is only 45 million acres to provide for an approximate population of 45 million, it will be seen that the land available is far from sufficient except under an intensification of production that is impracticable. We may lament the abandoned crofts on the fringe of the hills, but men and women left them because there was a richer living to be made elsewhere, and they will only be forced back to them by the return of the old hard struggle for existence.

The scheme of reorganisation I have indicated does not depend upon self-sufficiency. It has to use tariffs and quotas, sometimes as a method of defence against economic war, sometimes only as a means of giving

security and stability during a period of reconstruction that aims at increasing home production by exercising pressure towards increased efficiency. In so far as we have unemployment we can and ought to increase our output at home of all those commodities like meat and bacon, eggs and cheese, vegetables and apples, in the production of which we can be as efficient as any other country. At the present time we are producing in Great Britain only about one in every six sides of bacon we consume. Even if we hold by the old economics it will be sound business to replace some of these imports by home production, because the pigs here or in Europe have to be fed upon imported cereals purchased at the same world price. If our methods of feeding pigs and curing bacon can only be made as efficient as those of our competitors the pigs we consume can be raised here with some gain to the national economy. But even after all efforts to expand the production of pigs there will always be a market for imports, provided that those pigs can be obtained in exchange for our cotton goods, our boots, our steel-ware. The potential demand for pigs and bacon that our population could exercise if returned to full employment will be far from being satisfied even if we add all the capacity for production at home to the heaviest rate of importation we have ever experienced. The fundamental truth is that whatever may be the increased efficiency of production that science has put at man's disposal, it will be still insufficient to satisfy the reasonable demands of the population, when each in turn is producing some commodity that can be freely exchanged. It is precisely in this difficulty of exchange that the plight of the agriculturist resides, all the world over, and if we take a world point of view we see that agriculture cannot lift itself out of its depression by its own efforts. Farmers are the primary producers, the first sellers in the chain of commerce, but they are waiting upon a renewal of the power to buy on the part of their customers, i.e. the industrialists and the people at large. Whatever may be our power to revive British agriculture, because within our borders there is such an immense margin between our actual production and our consumption, yet world agriculture cannot revive until the wheels of international trade begin to go round more freely. I have already explained how the expansion of the gross demand upon the farmers for food depends upon the substitution, in consumption, of cereals for food of higher quality, but as long as general trade conditions result in low wages and unemployment the consumers are forced to live upon the lower range of qualities, whereby the total demand upon the soil is reduced, and over-production of the cheaper foods begins to appear. Poverty in fact breeds poverty. While there is an immense margin of agricultural produce that we can grow in Great Britain legitimately, i.e. by an expansion of skill and organisation—a gain,

therefore, in the nation's housekeeping—yet even from the agricultural point of view I watch with apprehension the growth throughout the world of the idea of national sufficiency. The idea of the totalitarian self-contained state that produces all it requires and admits of no imports is being held up as the new ideal. Often this conception is the product of mere muddled thinking that a non-importing country can still export its surpluses, that it can create a semi-permeable fiscal membrane which will allow goods to pass only in one direction. But even purged of this fallacy the doctrine of national isolation is gaining ground, a doctrine that depends upon an appeal to the emotions and is indifferent to the nicely calculated less or more of trade returns or standards of living. But let us not deceive ourselves; not only does the denial of external trade mean to that extent a diminution of opportunities for exchange and a lower sum total of divisible wealth in the community, even in so large a society as the United States or a British Empire could be if its constituents were all of one mind, but it entails poverty of the spirit also. Early civilisation grew out of trade, since that was then the only intercourse between peoples of different minds as of different products. Later history shows us how regularly the blossoming of the spirit in this or that nation has followed upon stimulus from outside. A self-contained nation of necessity becomes provincial, suspicious, obsessed by the belief that other people lack the elements of human nature. In so far as the State becomes God, owing no respect to other States or to its own members, lying becomes a duty in order to enhance the national ὕβρις; truth and justice become relative only to the supposed well-being of the State. Every nation has its school manuals of history which give a presentation of the facts coloured by the racial or religious persuasion of the writers. But these one-sided versions have in the past been at least unconscious, and from time to time get corrected as the methods of science and scholarship prevail. It has been reserved to the last few years to inculcate such distortions as a necessary part of national propaganda; in each country the schools, the press, the wireless are deliberately enjoined to expound the doctrine of a chosen people with an unblemished record. From this cultivation of self-exaltation the step is short to the inculcation of hatred of the foreigner with the inevitable concomitant of war, veiled or open. Indeed the sowing of discontents, the cultivation of internal discords, is already practised, the sowing of material pestilence is openly discussed.

But I am straying far from my text. I am stating the case for the organisation of our domestic agriculture as a means of increasing and cheapening production, as a means of adding to the real wealth of the country in the shape of commodities that we can exchange for other kinds of wealth, either internally or externally. The policy does not

involve isolation or the denial of international trade. Provided that other nations will join hands and play the exchange game fairly, we shall all gain by it, but in so far as the current doctrine of economic warfare between nations drives towards isolation, this enhanced production becomes a safeguard and a defence. But we must not pursue agricultural organisation as a means of achieving isolation, for that will renew the poison of the old Adam, of which the world has been slowly freeing itself as science grew and reason prevailed.

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