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Economic Aspects of Mechanization on Medium-sized Farms

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ECONOMIC ASPECTS OF MECHANIZATION ON MEDIUM-SIZED FARMS

THE use of machines on the land can give decisive help to agriculture in general and to small and medium-sized undertakings in particular, provided positive results rather than miracles are looked for. This reservation can never be stressed enough. Too many people, in fact, expect mechanization on the land to bring about a revolution analogous to that produced first in England, then in the world at large, by the introduction of machines into industry. In short, they expect an agricultural revolution parallel to the Industrial Revolution. This is pure illusion.

As a matter of fact machines on the land play a totally different part from that which they play in mills and factories, and it is not possible to draw an analogy between these two forms of human activity. This is because the machine in industry is an actual manufacturing agent—for example the loom, the power-lathe, the blast-furnace, or the assembly conveyor in a motor-car factory—whereas in agriculture the machine does no more than prepare the real work for the manufacturing agents (which are the animal or vegetable cells) or make easier the harvesting processes.

Thus, on the land machines play only an indirect part. In fact it may be said that there are no machines in agriculture, but rather that there are tools for certain parts of the work, each part generally being handled by one man only and rarely by a team. That is why equipment is worth only about one-third of the capital of an agricultural concern, whereas in a factory it accounts for about 90 per cent. of it.

This is true of the tractor as well as of the milking machine and is the reason why the use of machines on the land runs on lines completely different from those in industry and why it is vain to expect them to give results as spectacular as those in industry.

Once this fundamental reservation has been made, it is evident that modern agriculture is bound to profit considerably from the use of machines. Many of them were planned originally for large-scale undertakings of the American type and, in particular, for relatively flat country. But the very fact that agricultural machines are not so much machines as tools has made it possible to reduce them in

proportion to the needs of small and medium-sized undertakings. Whereas factories have been built around the machine and for the machine because the machine is the essential factor in production, it has been possible in agriculture to adapt equipment to situations where economic conditions favoured smaller concerns.

It is necessary, too, to define the terms 'medium-sized' and 'small' undertakings. In west European countries an undertaking of between 20 and 50 ha. can be called medium-sized, though these figures cannot be considered absolute as they are liable to vary according to the type of cultivation. For example, a vineyard or orchard of 20 ha. is a large property, while extensive rearing-grounds (such as those in the Causses du Tarn, where Roquefort cheese is made from the milk of ewes, or in parts of Scotland) are, for all their hundreds of acres, only small undertakings. The real definition of 'small' and 'medium-sized' undertakings seems to be an agricultural concern which can normally be run by the owner's family plus, perhaps, a small number of workmen, not exceeding two or three. It so happens that this is the most common type in west European countries, and it is for these smaller concerns that it is particularly important to provide help, for on them depends the raising of Europe's potential food production. The large-scale undertakings—those of from 50 to 500 ha. (with an average of 150 or 200 ha.)—seem to have progressed agronomically as far as possible. They are well-equipped on the whole, and in the selection of plants and animals as in the use of fertilizers would not appear to have much to learn. It is unlikely, therefore, that the next few years will see sensational advances on large holdings. The small and medium-sized holdings, on the contrary, have a margin for improvement precisely because until now it has not been possible to equip them properly.

The problem of mechanizing them is twofold. First, there must be a redistribution of the land to get rid of small plots which are difficult for working by machine as well as being badly situated, very often, and too far from one another. This problem of redistribution concerns France, Western Germany, Belgium, Holland, and doubtless a good many other countries. It is a matter for legislation and cannot be done overnight, for it is a long-term task. In France, for example, it cannot be hoped to produce results for twenty or thirty years, though eventually it will be possible no doubt to get rid of pieces of land of less than half a hectare in size which are practically unworkable by agricultural tractors, except the market-gardening and horticultural

kinds. But side by side with this work of land-distribution is also the considerable task of adapting agricultural machines, and particularly tractors, which have been designed nearly always for farms of at least 100 ha., to small and medium-sized holdings. In the last few years great progress has been made in England, France, and Germany. The latter country has succeeded in producing diesel tractors designed for holdings of about 8 or 10 hectares, and they repay close examination.

Another very important problem is the lowering of the purchase prices. Compared with that of cars, the price of agricultural tractors is very high though the methods of production are similar. The reason for this is that in Europe it has not been possible up till now to produce them on a large enough scale to result in lower unit costs. The mechanization of small and medium-sized holdings might well create a large enough market to justify production on a larger and therefore cheaper scale. As a big English producer said recently: 'There is no reason why a tractor produced on a large scale should be more expensive than a car of the same power.'

This brings in questions of finance and credit. Smallholders have not the same means as big owners have for the purchase of tractors. One possibility, in some cases, might be the joint buying of a tractor by two or three smallholders, but there are a good many reasons, some of them psychological, why this cannot be a general solution. In the case of reaping and threshing machines, however, the common purchase and use by a number of smallholders is quite feasible. But there is a need to modify the original models which were designed for the immense plains of America on the one hand or for large-scale European holdings on the other. On the mechanical side the difficulties do not seem to be insurmountable.

The last few years have raised a new problem in agricultural mechanization, that of the cultivation of mountainsides and slopes. It is a fact that agricultural mechanization was first adopted on any scale in level country. Such machines as sheaf-binding harvesters and tractors came originally from the United States of America. The flat or near-flat nature of the country to be cultivated made the work very much easier, and it can be said that the first agricultural machinery put at the disposal of farmers was essentially machinery for flat country or open spaces.

But mountain agriculture, or more generally, the agriculture of steep slopes, covers a considerable area and continual growth of world population calls for the cultivation of all that can be cultivated even

with difficulty. Problems of mountain agriculture have indeed acquired growing importance in the last fifteen years or so, and it is no longer a question of mechanizing what is easier to mechanize, but of facing more complex situations. England has made a vigorous effort in this direction, and there has been a fairly general drawing of attention towards this new aspect of rural economy in Switzerland, Germany, France, and Italy. Many manufacturers in several countries have devoted themselves to making equipment which can be used in vineyards or orchards on steep slopes, or for mowing and hay-making in mountain fields. Switzerland, as is natural, seems to have been the first to perfect equipment which is immensely useful to mountain farmers, including in some cases even the windlass. Mountain farms are often small or medium-sized, so a new chapter begins in the mechanization of the smaller holdings and promises well in technical achievement.

Such, it would seem, are the essential aspects of mechanization on small or medium-sized farms, though one last question remains—namely the monetary return from modern equipment used on these farms. This depends on long-term repayment of loans because the relative smallness of these farms allows for only a few hours of use of a machine each year. Thus there is no escape from the problem of credit and finance, whether it is provided by private banks or by agricultural credit organizations. It must be stressed, however, that mechanization on these holdings cannot be carried beyond a certain point without the risk of disastrous over-capitalization. In France, for example, just after the Liberation, motorization and mechanization were pushed sometimes so far that instead of costs being reduced, the financial side of farming was strained to an impossible degree. A nice balance is needed for each individual farm, and it will be the work of the next few years to formulate the principles on which it can be assessed.