Mechanization and British Agriculture

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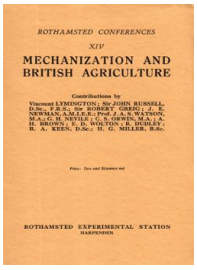

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COMBINATION OF LIVE STOCK WITH SYSTEMS OF MECHANIZED FARMING

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I feel sure that I need not, before an audience of this kind, labour the point that live stock constitutes a most important branch of English agriculture. The last estimate[1] that was made put the value of the annual output of live stock and live stock products at £155 millions or 69 per cent. of the total. Against this the value of the corn, potatoes and sundry farm crops sold on farms was £46 millions or about 20 per cent. of the total.

Neither need I say that for the past century and a half arable land has fulfilled a very important function in the live stock industry. A hundred years ago indeed it would have been more appropriate to look at the matter from the opposite point of view—to discuss the function of live stock in relation to corn growing. Even to-day there are districts where the cash crop is the main object, and stock is regarded as the subsidiary thing. But if we take the country as a whole and regard our problems from the national point of view we must, I submit, bear in mind that the live stock constitutes our major and the cash crops our minor concern.

The main function of arable land in relation to stock is the provision of winter food. Thus the arable farms of Norfolk and Lincolnshire have functioned as the complement of the store pastures of Ireland and of the fatting pastures of Leicestershire. The arable sheep districts have supplied our markets with early spring lamb and with winter mutton, while the hills have bred the stores, and lowland grazings have yielded the main supplies for the summer and autumn markets.

The recent decline in our arable area has upset to some considerable extent the balance formerly arrived at. There is now a shortage of meat in the spring and early summer. Graziers complain that the supply of stores in spring is inadequate to the areas of grass that have now to be stocked. On the other hand there is an increasing glut of half fat cattle and lambs in the autumn. If now we are

[1]The Agricultural Output of England and Wales, 1925.

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to have a revolution in arable farming, and if this is to imply the virtual disappearance of stock from large parts of the old arable area then the maladjustment between the supplies of winter and of summer keep will be aggravated.

In a considerable proportion of the arable farms that have so far been mechanized the system adopted is one of specialised corn growing; weed control is effected by means of a bare fallow; for the maintenance of fertility sole reliance is placed on artificials; straw is sold or ploughed in and no live stock—at least neither cattle nor sheep—is kept. We must, I think, consider whether mechanization necessarily involves so radical a change in our traditional system of farming.

No one can of course deny that mechanization must involve rather drastic reorganisation. For one thing mechanization can fully achieve its object, that of a really big economy of labour—if each enterprise is carried on upon a large scale. We cannot yet put this into very precise terms, but it would seem that the minimum area of corn is some two or three hundred acres and of hay between one and two hundred acres, while the minimum size of a dairy herd is about 60 cows. Each department necessitates the use of large and generally costly special machines. Clearly then, except on very large farms the number of enterprises must be limited. The inclusion of non-mechanized crops with large seasonal labour requirements will be difficult or impossible; the labour will not be available. The practical question then is how far the system can be diversified without departure from the fundamental principle which is, as I see it, to reduce the labour cost of the commodities which we produce. Let us consider present possibilities and hazard a few guesses about the future.

The hay crop, which is common to both arable and grass land, and is now our largest single source of winter food, can now, under most circumstances, be most completely mechanized—cut, windrowed, swept up and stacked by mechanical power. Indeed (given a large enough area and the absence of the obstacle of ridge and furrow land) the case for mechanization is even stronger than that of the cereals. Tractor sweeps and stackers of several makes are on the market. They are, relatively speaking, cheap. For hay making the tractor is not only faster and more powerful but also handier and more adaptable than the horse. Even the difficulty of a large capital investment in the form of tractors can be avoided, for it has been shown that second-hand motor cars can be cheaply adapted to the work and are perhaps actually more suitable for sweeping and stacking than the conventional type of general-purpose tractor. An alternative plan, where the hay has to be taken out of the field where it has grown, is to bale straight from the windrow, but whether this will work in our climate, over an average run of seasons, is perhaps yet to be demonstrated.

The root crops—mangolds, turnips and swedes—represent the other extreme of the problem. Even where these crops are grown

as part of a complex system, and some of the operations can be regarded as fill-time jobs, the cost in man and horse labour is frequently out of all proportion to their food value. It is only by placing fantastic values on the secondary benefits that one can show anything approaching a balance. The real cost of the crop when pulled and carted is perhaps as often over as under a pound a ton; it takes some twelve tons of roots to yield the same food value as a ton of maize meal and the latter can be at present delivered on our farms for about £6. With hay and corn mechanized there will be neither hand nor horse labour available to work any considerable breadth of root land. Our area of these crops has shrunk by roughly 40 per cent. since 1914. Mechanization of the laborious processes of singling and harvesting has as yet made little progress. The mechanization of other crops can only hasten the decline of root growing. I know that in the best root districts the picture of the economics of the crop is not so black as I have here painted it. But one must speak of average conditions.

I have far more hope for the kales. Let me indicate what I believe are their advantages and possibilities. They can produce full crops without anything like meticulous singling. They can, without loss of yield, be planted in wider rows than roots and are hence better adapted to quick intercultivation with the row crop type of tractor. They have a greater smothering effect than roots. They are more reliable as to yield, and will repay more generous treatment (especially in regard to nitrogenous manures) than turnips or swedes. Finally, their mechanized harvesting, where they have to be removed from the ground, seems to offer a comparatively easy problem to the engineer. The construction of a machine to cut and bunch the plants would not seem to be inherently more difficult than that of cutting and binding maize—which has been satisfactorily solved. A higher degree of winter hardiness would indeed be an advantage. Possibly a small acreage of silage would be a necessary insurance against frost damage to the kale. Even so, a combination of late sown rape, kale and silage would seem to provide an alternative preferable to that of the bare fallow in mechanized arable farming.

The next problem is that of the dung cart. Under certain conditions, of course, the problem may be dodged. On land suitable for outwintering cattle or for the Hosier system of dairying hay may be consumed where it has grown, and straw and forage crops probably very near to their source. Recent work at Aberdeen suggests that outwintering has certain actual advantages over house feeding, and I see no particular reason why it should not be applied to fatting cattle as well as to stores. I am assuming a short ley and that the stock would be wintered on this.

Sheep folding is another means of returning fodder crops and hay to the land. I do not suggest that a mechanized farm is a place for an arable breeding flock. I am not sure that there is any place left for one. The elaborate succession of crops, each on a small area

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of land, the performance of close folding and so forth do not fit in with the scheme of things. It has always seemed to me that where such a flock is kept everybody on the farm becomes a slave to the sheep and everything has to give way to their demands. But it is a very different matter to use roots as they are used in the northern counties, for fattening tegs or as a supplement for grass land ewes, giving a big "break" at a time. The labour charge is a small fraction of that which is involved in the old system of all-the-year-round close folding.

But sheep do not solve the problem of disposing of straw, and I cannot help feeling that this is a real problem. I cannot reconcile myself to the idea of ploughing it in, while there are thousands of hungry cattle to be fed. And I feel that any general suggestion of selling it is merely begging the question. There is a shrinking market for straw outside our own industry, and we cannot live by taking in each other's washing. You may say that the grassland farmer is a customer, and that it will be part of the general process of specialisation that he should rely more upon the arable farmer for his supplies of straw. This is probably true as regards the dairy farmer, but as regards the winter feeding of cattle other than dairy cows the question is whether it will be more economical to take the food to the stock or the stock to the food—in other words, which is Mohammed and which the mountain. Moreover, supposing that muck is a grossly over-rated manure (which I do not believe), it is still of far more use to the arable man than to the grassland farmer.

Sir John Russell has already spoken on this question of the maintenance of fertility, but I hope he will forgive me one observation on this question of the value of dung, and of humus in general. It is this, that the value of organic manures depends tremendously on the kind of soil that one is dealing with. This was impressed upon me from my earliest days. On one side of me was the Carse of Gowrie, an area of deep rich heavy silt, low lying and nowhere far above a permanent water table. There the farmer can, and sometimes does, follow wheat with oats and hay, sell the lot and carry on. You cannot, to use our local phrase, "tear the guts oot o' the land"—it is all guts together. But on the Old Red Sandstone gravelly loams, which adjoin there is a different story to tell. The man on such soil who keeps little stock and sells his hay and straw very soon farms his land out, even if he is liberal in his use of artificials. I think we must not too hastily assume that we can, even now, anywhere and everywhere, abandon stock and place our trust in chemical manures.

If land is unsuited to outdoor winter feeding, and at the same time needs organic manures we have undoubtedly a difficult problem. I do not know what the solution is, but we must not give it up.

Let me conclude by briefly sketching out an example of the kind of system that I have in mind. We must have some six hundred acres of arable land, or rather more if it is poor stuff. Additional grass, as I see it, will be no disadvantage, but rather the contrary.

Suppose the soil to be a medium shallow loam, the climate neither wet nor very dry. Suppose, too, that the land can be fenced and watered. Now arrange the land for a five course rotation including two corn crops, a two years ley and, for the fifth division, a combination of rape, kale and silage with perhaps a bit of fallow when necessary. The corn crops will be " combined " and the straw swept up and stacked in the field. The first year's seeds might be hayed and the crop mostly consumed on the land during the succeeding winter, along with straw and the kale and silage. The ley could be grazed with cattle or with grassland sheep during the second year, and then ploughed under—you may fill in the details and modify the scheme here or there far better than I can. The emphasis might be placed more on corn or more on stock ; a greater or less proportion of hay and straw might be sold according to experience. The scheme need not be hard and fast. But I suggest that in its elements it is a workable alternative to the stockless mechanized farm.