The Live Stock Industry and its Development.¹

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STATE AID TO THE LIVE STOCK INDUSTRY.

UNTIL quite recently, all efforts to improve the live stock of the British Empire were left entirely to private individuals—the breeders of pedigree stock—and this small band of enthusiastic workers have left behind them a notable monument to their skill and unremitting labours in the formation of breeds and in the improvement which they effected in the type and quality of pure bred stock.

It was only at a comparatively recent date that the British Government considered the agricultural industry to be of sufficient importance to justify the State in making some financial provision for its improvement and development.

The first parliamentary grant for the special purpose of live stock improvement was voted in 1885. This grant was given to Ireland to be administered under the auspices of the Royal Dublin Society, which adopted the method of subsidising pedigree sires, and thus Ireland was the pioneer country in the British Empire to undertake live stock improvement with the help of a State grant.

Since 1914, parliamentary grants for the improvement of live stock have been made to the Ministry of Agriculture and Fisheries and to the Board of Agriculture for Scotland, and each of these Departments put into operation schemes somewhat similar to those in Ireland.

The live stock schemes originally devised by the Royal Dublin Society were continued and developed by the Irish Department of Agriculture, which was established in 1900, and on the formation in 1922 of separate parliaments for Northern Ireland and for the Irish Free State, still further extensions of the schemes were made by the Agricultural Departments of these two Governments.

The latest published figures for each part of the United Kingdom and for the Irish Free State show the total number of breeding stock, the total number of bulls, and the number of these sires subsidised to be as follows :

	No. of Breeding Stock (Cows and in-calf Heifers).	Bulls.	Subsidised Bulls.
England and Wales	2,790,703	88,405	1287
Scotland . . .	460,317	17,578	937
Irish Free State .	1,332,591	23,275	2205
Northern Ireland .	270,283	4,662	623

From the following table it will be seen that the proportion of subsidised to non-subsidised bulls and the number of breeding stock per subsidised bull vary very considerably in the several parts of the British Isles.

Turning for a moment to the Dominions—

In Canada the improvement of live stock is developed chiefly by two methods :

1. The Live Stock Branch of the Department of

Agriculture of the Dominion Government purchases and loans out pure bred bulls to specially organised associations in newly settled districts and in backward sections in the older Provinces. This system was commenced in 1913, and 4692 bulls had been placed out on loan up to 1926, an average of 361 bulls per annum. By this means the value of

	Subsidised.	Non-subsidised.	No. of Cows per Subsidised Bull.
England and Wales	1 to	69	2168
Scotland . . .	1 to	19	491
Irish Free State .	1 to	11	604
Northern Ireland .	1 to	7	434

pedigree sires has been demonstrated and farmers have been induced to purchase pure bred sires for their own use.

2. By grading beef cattle, sheep, and lambs according to age, quality, and weight when they are put on the market, and by demonstrations and propaganda, attention is directed to superior beef and mutton. In this way a growing demand from the consumer for more tender and juicy joints has been created. This plan has directly assisted breeders to improve their stock, as considerably higher prices can now be obtained for prime beef, mutton, or lamb than for coarse joints. The Canadian Government is paying special attention to this side of marketing with remarkably successful results. The home consumption of meat and eggs per head has gone up considerably since this system of grading was commenced. Thus, in 1916 the consumption of eggs per head was sixteen dozen ; in 1927 it had increased to twenty-eight dozen and all exports had ceased.

Australia (Queensland) in 1925 adopted a scheme by means of which the Department of Agriculture made available to the approved purchaser of a pedigree bull a subsidy of 50 per cent of the cost price, provided the subsidy did not exceed £50.

In South Africa a scheme for the distribution of pedigree bulls to farmers in the Transvaal through breed societies came into operation in 1924. These animals are sold to selected applicants at reduced prices. Several of the agricultural schools throughout this Dominion have stud farms, and young sires raised on these farms are sold and placed out under the Department's bull distribution scheme.

Although the value of the State-aided live stock breeding schemes in Ireland was clearly shown in the great improvement in the stock of the country both in quality and in the increased prices obtained, the results achieved were not anything like what they would have been if the widespread use of animals totally unsuitable for breeding purposes had been prohibited. The scrub bull not only inflicted serious damage on the owners of cows, but also lowered the reputation and value of Irish live stock and to a large extent neutralised the good effect of the live stock schemes.

¹ From the presidential address to Section M (Agriculture), delivered at the British Association at Glasgow on Sept. 6.

These were the chief reasons which induced the Governments of Northern Ireland in 1922 and of the Irish Free State in 1925 to introduce legislation providing that bulls below a certain standard of merit should not be used for breeding purposes and that all suitable bulls should be licensed. By subsidising pedigree sires we have the means of improving and grading up our stock, and by permitting the use of none but licensed sires we get rid of the inferior animals and prevent them from doing harm. This ensures that the improvement is continuous and that much quicker results are produced.

In England and Wales there is only one premium bull to every sixty-nine non-premium bulls, and there are 2168 cows to each premium sire, whereas in Northern Ireland, where more than half the number of bulls are pedigree animals, there is one premium bull to every seven non-premium bulls and 434 cows to each premium sire. Yet after forty years' experience of the premium scheme, we have found it absolutely necessary to bring in a licensing system to supplement the former owing to the progress of improvement being so comparatively slow.

Great Britain has the reputation of having the finest pedigree stock in the world, and yet probably nowhere else in the British Empire is improvement in the cross-bred cattle more urgently needed. It is a strange anomaly that our pure-bred stock are exported to all parts of the Empire and to foreign countries for the improvement of the native stock, while at home our own cross-bred stock are in comparison so inferior to the pure-bred stock.

In Canada, United States, Australia, and South Africa the elimination of the scrub bull has received attention, and these countries in recent years have instituted with considerable success campaigns against the use of inferior sires. Western Australia introduced legislation, which came into operation in 1924, to enable its agricultural department to get rid of scrub bulls.

IS FURTHER STATE AID REQUIRED?

Would it be advisable for the State to devote larger funds than are granted at present to the improvement of live stock? My opinion is that, as the money which has already been applied to this purpose has proved so reproductive, and as the live stock breeding industry is so important to the whole community, it is questionable if funds expended in any other way could produce anything like the same returns.

In January 1923, Mr. T. P. Gill, who for more than twenty years was Permanent Secretary of the Department of Agriculture, Dublin, stated before the Commission on Agriculture appointed by the Irish Free State, that—

“By the infusion of pure bred blood and better methods of keeping, feeding, and management, producing an animal which matures more quickly, fattens more cheaply, and yields more beef and milk, the intrinsic value, independent of price fluctuations of Irish cattle, has been increased since the department started in 1900 by about £5 per head.

This is based on the estimates of the British Salemasters who handle this import as well as of the most experienced Irish cattle traders. On the number of cattle exported last year, counting the exports only, this would mean an increased annual income of approximately £5,000,000 for an expenditure of £20,000, or a return of 250-fold.”

If we calculate that the increased value was only £3 per head, it means £3,000,000 per annum, or a return of 150-fold.

Some will think, perhaps, that I have laid too much stress on the importance of the pedigree sire in the improvement of stock, but the improvement which has taken place in the stock of the Argentine Republic gives us food for thought. In 1848 the first shorthorn bull was imported into that country. At that time only native breeds existed, animals which from our standard were of very inferior quality and extremely slow-growing. The Rural Society founded in 1875 was the chief agency in bringing about improvement in the live stock of the Argentine chiefly through the importation of pedigree sires and through the shows of live stock held by the Society.

In 1895 native cattle constituted 50 per cent of the total in the province of Buenos Aires. In 1914 this had declined to 3.5 per cent. The cross-breds and half-breds increased during this period of twenty years from 49.2 per cent to 93.9 per cent, and the pure-bred or pedigree cattle from 0.6 per cent to 2.5 per cent.

Similar progress in the case of sheep has been recorded. In 1895 native breeds constituted 16.5 per cent of the total; in 1914 they had fallen to 2.3 per cent. The cross-breds increased during this period from 83 per cent to 95.6 per cent, and the pure-breds from 0.5 per cent to 2.1 per cent. In the other provinces an equally noticeable improvement has been effected.

Between 1895 and 1922, 41,519 pedigree bulls were exported from the British Isles to the Argentine.

To-day the best quality Argentine chilled beef ranks next to the best home-produced, and in Smithfield Market it commands prices higher than some of our own home-produced and considerably higher prices than any other imported beef.

The following figures from the *Statist* show the prices of home and Argentine beef for the year before the War, for 1926 and for 1927:

Class of Beef.	Prices per Stone of 8 lb.		
	Jan. 30, 1914.	Dec. 2, 1926.	Dec. 3, 1927.
Argentine chilled hind-quarters	3s. 8d. to 3s. 10d.	3s. 10d. to 4s. 4d.	4s. 8d. to 5s.
Scottish sides.	4s. 6d. to 5s.	6s. 6d. to 7s. 4d.	6s. 4d. to 7s.
English sides.	4s. 2d. to 5s. 1d.	4s. 8d. to 5s. 6d.	4s. to 4s. 10d.

English sides, it will be observed, have actually fallen in price since 1914, whilst Argentine chilled beef has risen. The substantial difference in favour of English beef over Argentine chilled beef which existed in 1914 has disappeared. The two principal

factors in this revolutionary change are the use of pedigree sires and marketing methods. Surely no stronger argument could be put forward for the urgent necessity for the improvement of the cross-bred cattle of the British Isles.

NEED FOR EXTENDED RESEARCH.

Although I consider that the pedigree sire is the best foundation for the improvement of live stock, it is by no means the only way by which improvement can be brought about. The changes and improvements already mentioned are largely the results of the ability and judgment of the breeder himself, but latterly he has been assisted considerably by the agricultural scientist, chiefly along four distinct lines of research and experiment: (1) animal nutrition, (2) animal diseases, (3) animal breeding, (4) marketing.

Animal Nutrition.—Animal nutrition is of the greatest importance from three points of view—

(a) Most stock owners will agree that the greatest mortality in live stock is due either directly or indirectly to imperfect nutrition and not to disease—probably seven out of every ten deaths occurring on farms in the British Isles (excluding those caused by accidents) are due to imperfect nutrition.

(b) Owing to early maturity and forcing young animals forward to an age when they are ready to be killed, a much more thorough knowledge of foods and the science of feeding is necessary than under the old system. In the case of cows with high milk yields and of poultry where high egg records are being produced, such knowledge is specially required.

(c) The practical farmer as a rule has little or no knowledge of how to form well-balanced rations; indeed he has a very slight knowledge of the composition of foods and of their physiological action. How could it be otherwise when we consider that it is only of recent date that attention has been given by agricultural scientists to the necessity for balanced rations in feeding different kinds of stock and how little even they know about the digestibility of foods, the proper balance of a ration, and the action of minerals in relation to health and disease resistance.

In 1890 the British Government gave local authorities (county councils) in Great Britain grants to be used either for reducing rates or for agricultural and technical instruction purposes. Many of the county councils from the beginning utilised those funds entirely in developing agricultural and technical instruction schemes, and in later years all the county councils expended these grants in this way. From 1890 until a few years ago practically all the funds made available to local authorities for the development of agriculture were applied to agricultural education, experimental and research work chiefly in connexion with soils, manures, and crops, comparatively small amounts being devoted to research and experimental work on live stock problems.

While I realise the great advantage to be gained by the application of science to soil, fertiliser, and

crop problems, the chief factor in the British Isles is live stock, and it has been to a great extent neglected. It is the chief source of our farmers' income—the hub of the wheel—and, so long as the production of live stock is an economic success and crops are utilised chiefly by converting them into live stock products, more attention should be given to research on live stock problems than to the experimental side of soils, manures, and crops.

This position is, however, being rectified, and we have now research stations engaged in animal nutrition work at Aberdeen, Cambridge, Belfast, and Dublin, but the funds available are quite inadequate if this work is to be developed on broad lines and is to be of practical assistance to the stock breeder in his efforts to overcome many of his difficulties and losses.

Animal Diseases.—I am sure that no one will question the need for extended research into the diseases of our farm animals or the necessity for protecting our live stock industry against epidemics which annually threaten it so seriously. In connexion with the latter I may refer to the outbreaks of foot-and-mouth disease in Great Britain, which have been almost continuous since 1919, and have been the cause of the loss of so many stock through slaughter. During the last nine years, 1919–1928, no fewer than 162,214 cattle, 114,679 sheep, 71,536 pigs, and 256 goats have been slaughtered, and the compensation paid to farmers amounted to £5,314,000. This does not by any means cover the full value of pedigree stock, as only commercial prices are paid in compensation, nor does it include the administrative expenses incurred in stamping out each outbreak of this disease. Moreover, when whole herds of pedigree stock are slaughtered, it means in many instances the destruction of the life work of breeders—work which can never be replaced—and for this loss no sum could ever compensate the breeders or the State.

Here is a field of research which would justify the State in devoting large sums in order to employ the most skilled scientists obtainable to ascertain a means of prevention. When we consider the enormous cost to the nation and the constant danger of losing our best pedigree herds, as well as the possibility of losing our trade in pedigree stock with other countries, the justification for further and immediate research in this direction is apparent.

Considerable loss to our agriculturists is caused by many other animal diseases regarding the prevention of which very little is known. The most important are tuberculosis, abortion, infertility or sterility. The first named not only causes loss through the death of animals but also is a constant source of danger to human beings through the consumption of milk from tubercular cows. The latter two diseases are widespread in many areas and affect seriously the production of stock. These are only a few of the many animal diseases into which research is required and for which adequate funds are urgently needed.

Animal Breeding.—One of the greatest problems

which breeders have to face in the management of their studs, herds, and flocks, is the selection of sires. Both amateur breeders and old experienced breeders have the same difficulty, namely, how to select a prepotent sire. The only way in which breeders can determine this at present is by the offspring. This means a delay of two years in the case of beef cattle and from three to four years in the case of dairy cattle. If, at the end of that time, the sire proves unsuitable, the owner may have from two to four crops of calves inferior to their parents and, therefore, of no use in improving the herd, and such animals have to be sold at an unremunerative price. The owner suffers a considerable loss in time as well as money, and runs the risk of ruining his herd if he retains animals of this blood.

Owners of small flocks or herds cannot afford to keep more than one high-priced sire, and therefore are handicapped much more than those who own large herds or flocks. The latter can afford to keep a number of sires on trial, mating each with only a few females until each sire is proved, instead of risking all the herd with one unproved sire, as has to be done in most cases by small breeders. In Scotland most of the herds of pedigree cattle are in the possession of tenant farmers, many of whom have only small farms. In Northern Ireland there are 682 pedigree herds, and the majority of the owners have farms less than fifty acres. These breeders could not afford to keep more than one sire or to pay a very high price for a pedigree sire. Money may enable the breeder to procure a high-class sire of a fashionable pedigree, but this is no guarantee that the sire will prove to be a good stud animal. Experience and judgment also assist the breeder in his selection, but even the most experienced breeders and keenest judges often purchase animals which turn out quite unsuitable as sires.

Another problem is how to induce breeders of commercial stock and even breeders of pure-bred dairy stock to keep bulls until such time as the value of their progeny can be determined, and then to retain, so long as they will produce stock, those sires which are proved to be suitable. This question is of the greatest importance in dairy herds, where frequently the bull is dead when his daughters are proved to be good yielders of milk and butterfat. Well-bred bulls should be retained until the daughters have demonstrated their sire's true value, and, by the exclusive use of such pure-bred bulls, a real advance would be made in the breeding of dairy stock.

Many pedigree herds and flocks have made names or high reputations simply as the result of having one prepotent sire, and when that sire died these herds for years afterwards lost their reputation for high-class stock. If the animal geneticists could show how to diagnose a prepotent sire or how to breed animals with this hereditary trait and make breeding more of a certainty and less of a gamble, it would encourage and give a stimulus to the breeding of high-class animals, which would reach much further than any form of State subsidy given

directly to breeders of pedigree stock, and would be worth millions in money to stock breeders throughout the world.

CONCLUSION.

To sum up, I should like to emphasise the supreme importance of the live stock side of our agricultural industry, the immense scope for development which exists, and the exceedingly rapid strides which can be made in its development by the application of our present knowledge along properly organised lines. We can do for stock in the relatively short period of ten to fifteen years what has been accomplished for crops from 1840 to the present time. Unless we bestir ourselves and organise our efforts we shall find our home markets for stock and stock products in the hands of our competitors, who already, by purchasing the best of our pedigree sires, are placing on our markets products which are superior to the great bulk of our home-produced supplies.

The pressing necessity at the moment is for improvement in our commercial cattle—the great disparity between them and our pedigree stock is little short of tragic. The means towards this end are: (1) The increased use of pedigree sires, and in this direction the State can with great advantage to itself provide a powerful stimulus by the rapid extension of the premium scheme; (2) the elimination of the scrub bull, which, to my mind, with human nature as it is, will only be accomplished in an effective manner by legislative means.

It must not be forgotten, however, that as progress is made in grading up our stock by breeding methods, it is imperative that there should be corresponding developments in our knowledge of nutrition, disease resistance and elimination, and in animal genetics. Research in these branches of agricultural science has in the past been starved. The funds devoted to such work are quite inadequate when viewed in the light of the importance of the live stock industry, which in England and Wales alone is worth, approximately, £154,000,000 per annum.

In connexion with this work may I stress the necessity for such research to apply itself more directly than at present is the case to the solution of practical problems. I realise clearly the need for fundamental research, or, as it is now called, long-range research, but agricultural scientists should be, as the designation implies, essentially applied workers. In setting themselves some of the problems which I have sketched, they will meet with sufficient really fundamental problems to keep them employed for many years to come.

Finally, I would reiterate the necessity for a comprehensive reorganisation of our methods of marketing stock and stock products. If it can be accomplished on a voluntary basis so much the better, but I am convinced that compulsory legislation will eventually be necessary. Much valuable time will be saved by facing this position at once. There is a bright future for the live stock industry, but only if we are prepared to attack the problems which it presents in a live and organised manner.