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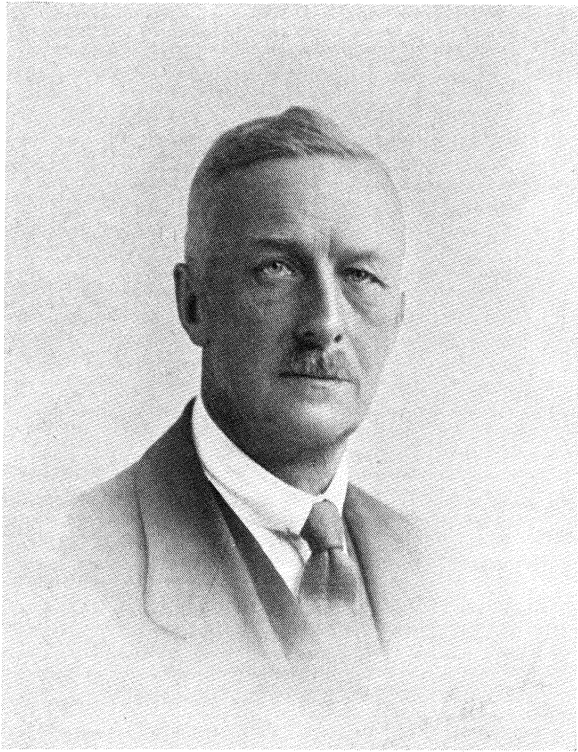




CO-OPERATION IN DANISH  
AGRICULTURE

**“Co-operation is a thing most excellent.”—W. E. GLADSTONE.**





Harald Faber .

# CO-OPERATION IN DANISH AGRICULTURE

BY  
HARALD FABER

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AN ENGLISH ADAPTATION OF  
"ANDELSBEVÆGELSEN I DANMARK"

BY  
H. HERTEL.

---

WITH A FOREWORD BY  
Sir E. J. RUSSELL, D.Sc., F.R.S.

DIRECTOR OF THE ROTHAMSTED EXPERIMENTAL STATION, HARPENDEN

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## FOREWORD

By E. J. RUSSELL, D.Sc., F.R.S.

IN the following pages Mr. Faber has taken the Danish text of Mr. Hertel's Report on the Development of the Co-operative movement in Danish Agriculture and put it into a form suitable for English readers. We have had several accounts before, notably those by Mr. Christopher Turnor, Levy, Wolff, and others, but none covering the same ground as this. Previous writers have described from without: they have visited Denmark, seen the wonderful results achieved by the Danish farmer, and on returning home have recorded their impressions. The present book deals with the movement from within: Mr. Hertel, through his intimate association with the Danish Central Co-operative Committee, and the Royal Danish Agricultural Society, has access to all the records of the movement, while Mr. Harald Faber not only knows Danish agriculture thoroughly, but is also well acquainted with English conditions. English experts have long since learnt to "ask Mr. Faber" whenever any question arose as to Danish agriculture; they will have in this book a valuable summary of the information he has been in the habit of giving them.

It would be difficult to find a more entrancing subject than the history of Danish agriculture between 1860 and 1912, roughly the period covered by the book. Up to the beginning of this period the story has been much the same as our own; there had been a steady improvement from the beginning of the nineteenth century to the culmination in the sixties.

The system had been essentially one of corn production; but in order to get the best results it had to be combined with live stock. It was in working out the combination that Danish agriculture took a line of its own which gradually led to complete differentiation from other European systems.

The English farmer had gone in for meat production. The Danish farmer, on the other hand, went in for dairy work. The choice was momentous, and we should like to know a little more fully exactly what determined it. Events have shown that it was emphatically the right choice, because dairy farming produces much more food per acre of ground than meat production, and it allows full scope for, indeed it necessitates, those co-operative methods of business and production which have since dominated Danish agriculture. We are proud to remember that Segeleke, the young Dane who played a prominent part in bringing about the change, first spent a year at Rothamsted, and then went straight from there to take up his work in Denmark. Co-operation came later. In 1882 Stilling Andersen founded the co-operative dairy at Hjedding, which is usually regarded as the starting-point, though, as a matter-of-fact, a co-operative dairy had already been established in 1875.

The wisdom of the Danish choice was evident in the 'eighties and 'nineties when Europe was flooded with cheap agricultural produce, especially corn from the virgin countries of the New World and Australasia. Wheat fell to nearly half the price it had commanded in the 'sixties. English agriculture suffered a terrible set back, and did not begin to recover until about 1896. Danish agriculture, on the other hand, was able not only to weather the storm but even to make headway all the time. The improvement in dairying reacted on the arable farming: the export of butter rose from 10,900 tons per annum in the late 'seventies to 100,000 tons per annum before the War, and the yield of wheat rose from 30.9 to 36.5 bushels per acre.

Thus the Danish system has proved to be eminently suitable for the production of wheat from the land.

Herein lies the great importance of its lesson for us. Whatever may be the ending of the War, and whenever it comes, we may be absolutely confident that times of serious difficulty lie ahead. However much wise statesmanship may mitigate the effects of the destruction brought about by the War a time of stress will come as surely as night succeeds to day; the very word "Reconstruction," now on every one's

lips, shows that most people realize this. The new structure may be better or worse than the old, but the old one has been so much shaken that we shall have the labour and the pain of building a new one. Science may do much in giving us new methods; but in agriculture the determining factors are human, and experience shows that history alone gives the key to the human factor. If we know what men have done before in given circumstances, and how they did it, we know what they can do again.

This book, therefore, comes most opportunely. We all wish that the agricultural reconstruction necessitated by the War shall give us a better and a happier country life than we had before. Messrs. Faber and Hertel show by what means Denmark started out from a humbler beginning than, let us hope, we shall be called upon to start from, and ended with a degree of prosperity that we should be happy to attain. The book is not, so to speak, a picture, but rather a working model with complete diagrams. We are given a detailed account of the various societies, the points where they proved defective, how the defects were remedied, and what measure of final success was achieved.

In solving our own problem we shall not necessarily use the same model; we are more likely to follow our national bent and improvise or design one adapted to our own special conditions. But the Danish model here described has proved an extremely potent constructive implement, and we shall do well to study it closely.

The essential feature of the Danish method is co-operation. The prodigious effect that combination of effort by the whole body of producers can exert in increasing output, in cheapening cost of production, in improving the quality and value of the produce, and in ameliorating the lot of the labourer, are shown by the statistics abundantly scattered throughout the book. During the period when Danish agriculture was making great progress, British agriculture gained little or nothing in prosperity; it first declined and then rose, but probably not beyond its original starting point. The British method, in short, proved less capable of adaptation to new and adverse conditions than the Danish. Critics may argue

that the same methods would not apply here; that the British farmer is so confirmed an individualist and so imbued with the idea of running his own farm in his own way that he cannot co-operate with his neighbour. It may or may not be so; but it is imperative that we should do something, and if we discard the Danish model we must at least try to produce a better. The book stands as a record of good work well done.

# PREFACE

By MR. HARALD FABER

THE wonderful system of co-operation in Danish agriculture, in the highly developed form in which we find it now, embraces almost every branch of agriculture and agricultural industry, and has its ramifications in practically every parish in Denmark. It has built up an organisation so complete that all the threads converge to one point from which the joint action of the whole system is in a certain measure controlled. ✓The co-operative movement in Danish agriculture was not started by a circle of philanthropists or even by the landlords for the purpose of benefiting the practical farmers. It has grown up locally and gradually among the peasants in the villages, and takes its root in the feeling of solidarity and a sense of the benefits of mutual help among the peasants which can be traced back to remote centuries. ✓The date of the foundation of the agricultural co-operative movement in Denmark cannot, therefore, be given as it can in some countries where it owes its inception to the action of a single man or of a committee. Attempts to introduce co-operation in Denmark, fostered by philanthropists, were made in the middle of last century, but they aimed at helping the industrial workers in the towns and achieved but very little success. But the peasants, with their experience of mutual help within the village communities, eagerly took up the idea of co-operative supply stores on the Rochdale system, which the town workers were unable to maintain when these stores were introduced for their benefit in 1866. Another form of co-operation was introduced in 1850 from Germany, viz.: the Credit Associations, which for some time were supported almost exclusively by the large landowners. Co-operative Credit Societies, which in several other countries were the first form of co-operation among the

artisan and peasant classes, found no favour among Danish peasants, who were little versed in financial matters and perhaps also felt the need of credit less.

It is characteristic of Danish agricultural co-operation during the latter half of last century that it aimed almost exclusively at improving agriculture or agricultural industry.

The peasants formed societies for the purpose of enabling them to adopt means for the improvement of their live-stock which they saw practised by large land-owners, but which they themselves individually could not afford to employ. They also combined, in other societies, to improve their business by the manufacture of butter and bacon on an industrial scale, and introduced quite original modes of co-operation, such as the "control" societies. Later on they took up the question of improving farm seed, both by producing better strains of different kinds of plants, chiefly corn and roots, and by buying these improved seeds through special co-operative purchase societies. All these and sundry other co-operative societies, each with its own single object, were formed by the peasants for the purpose of improving their farming, in the widest sense of the word; and the success achieved was such that gradually farmers in a large way and even wealthy land-owners found it to their advantage to join these peasants' societies.

The local societies form the backbone of the Danish co-operative movement. Local societies of the same kind sometimes combine to form Associations, but the independence of the local societies remains unimpaired. The farmers in a village form their supply store, their co-operative dairy, their "control" society, bull club, horse-breeding or egg collecting society, all being co-operative and all being independent of one another, although the members and even the committee members are often the same individuals. The co-operative societies of the same kind in the villages in a district have in many cases formed an Association, and similar Associations would be formed in other districts, for instance, Associations of Co-operative Dairy Societies or Associations of Bull Clubs. These district associations, in some instances, again combine within larger districts or within the three provinces, Sealand,

Funen, and Jutland, to form Provincial Unions, but each keeps strictly to its own sphere, the Provincial Union of Horse Breeding Societies, for instance, being independent of the Provincial Union of Co-operative Dairy Societies, although it may very well happen that some prominent peasant may be a member of the committee of more than one Association or Union in his district or province. The Provincial Unions of the dairy societies have combined to form a Central Organisation for the whole country. In some instances the local co-operative societies, such as the Co-operative Bacon Factories, each of which serves a fairly large district, have formed a Union for the whole country, as also have most of the Co-operative Distributive Societies. These Associations or Unions have no power to interfere in the working or management of the independent local societies; their function is generally restricted to giving advice, helping to keep the societies on uniform lines, and representing them in their relationship to others; or they take up work which the local societies could not do, such as the collection of statistics. The more important of these Central or Provincial Unions together with some large co-operative societies extending their operations to the whole country, have combined to form a central representative body, the Central Co-operative Committee ("Andelsudvalget"), which thus forms as it were the keystone to the complete arch.

It is only quite recently that the question of co-operative short credit, as distinct from the Credit Associations, has been taken up by Danish peasants through the Co-operative Village Banks. At the same time, the more complete organisation, through the Central Co-operative Committee, has enabled the co-operative societies to form a Co-operative Bank. It is the intention in future to call large annual meetings of delegates from all the co-operative associations affiliated to or represented on the Central Co-operative Committee for the discussion of all co-operative questions of a general nature, and for the purpose of voicing the wishes of the co-operative societies, for instance, in their relation to the State.

An important development which seems to indicate a possible solution of the difficult problem of how to counteract trusts and similar combines has been successfully practised

by Danish co-operators on at least two occasions. When the trade supplying certain goods necessary to farmers, threatened to combine to exact conditions for the sale which were considered unfair or unreasonable, the farmers were quickly roused, in large numbers, to form a special society for the purpose of supplying those very goods on co-operative lines, thereby delivering the most effective counter-stroke possible to the attempt to enforce unjust conditions, both by withdrawing most of the custom from the threatening trust and by establishing a standard of fair prices and conditions as a guidance for others. This remedy against trusts seems as unobjectionable as it is effective, but it requires a population with a wide experience of co-operation and trusted and versatile leaders.

✓According to the Danish conception of a co-operative society, it is essential that the members themselves should manage the affairs of the society; that they should be jointly and severally liable for the loan raised to start the society; that they should have one vote each and only one, independently of their share in the transactions of the society; that goods should be distributed to, or produce delivered by, members at current market prices, and that the net surplus, after a substantial contribution to the sinking fund, should be divided among members according to the amount or value of their transactions with the society. Danish co-operative societies are neutral, that is to say, they take no part as such in political, temperance, or religious movements. They are open to all. Many of them bind their members, absolutely or to a definite extent, to take their supply from, or to deliver their produce to or through the society. Payment in cash is generally stipulated. As already said, the local societies form the backbone of the movement, and confine themselves to the solution of only one special problem each, be it the improvement of a particular kind of live-stock, or the joint purchase of farm seed. If a new object is in view, a new society is formed. Thus there are special local societies for cattle breeding, others for testing the milk of individual cows and herds, others for making butter from the milk, others for selling the produce of the dairies, and even a special society for the

marking of butter, though this latter has now been superseded by legislation initiated by the peasants themselves. ✓

The difficulties experienced in some countries, when starting a co-operative undertaking, are often caused by the competition from the trade affected. A co-operative bacon factory, for instance, might be likely to take custom away from private bacon manufacturers or pork butchers in the district. These would, therefore, try, by offering the co-operating farmers a higher price for their pigs, to draw these away from the co-operative factory, hoping thereby to render its existence impossible, and then later on, with less competition, to recoup themselves by getting the pigs cheaper. To defeat this not uncommon nor unnatural form of competition, ✓ Danish co-operative societies have in several instances applied the rule of compulsory delivery. ✓ The co-operators will bind themselves for a number of years to deliver all their pigs to their co-operative bacon factory, or all their milk to their co-operative dairy, except what is wanted for their own use; or they will bind themselves to buy either all the artificial manure they want, or a certain quantity, through their co-operative purchasing society. ✓ They show thereby an obedience to self-made laws which gives a great strength to their co-operative undertakings and enables them to defy all competition. By the time the period for which they have bound themselves has expired, a sufficiently long test has been afforded to show whether the undertaking was sound or not.

It has sometimes been considered a shortcoming of the Danish co-operative societies that they have not set themselves idealistic or philanthropic aims or devoted some part of their surplus to educational purposes. This, however, is an undeserved stricture based on a misunderstanding of the co-operative movement in Denmark. The co-operative societies as such have not taken up education or other social work, but the members of the co-operative societies, *i.e.* the farmers themselves, have done so. Just as they have found it practicable to form a special society for each special object, so they have found it advisable to maintain societies for technical or commercial work distinct from societies with idealistic aims. The Danish farmers are well supplied with schools, and several,

both of the people's high schools and of the agricultural schools, belong to joint stock companies of farmers formed for that purpose. In the same way the farmers have their public libraries, their assembly-room in almost every village, their benefit societies, societies for insurance against unemployment, in some cases their own free church, and political and other societies for various purposes. It works for the strength of the co-operative societies that they are kept absolutely neutral and open to all men, independently of their political, religious, or social inclination. An exception is made by the Danish Sanatorium Society, which was formed in 1904 by co-operative societies, for the purpose of building sanatoria or convalescent homes for members, this term being understood to comprise members' households, *i.e.* man, wife, children, and servants. Any co-operative society can be accepted as a member by paying, once for all, 8s. 6d. per individual member. In April, 1917, 1070 co-operative societies, including 715 co-operative dairy societies, had joined with 182,000 individual members, and had paid £31,400. The society has a beautiful sanatorium, Krabbesholm, in a park of 53 acres, with accommodation for 114 patients.

The agricultural population in Denmark numbers about 500,000 heads of households, of whom 172,000 are employers. There are about 70,000 farmers and peasants, and about 100,000 small-holders; besides these are a large number of agricultural labourers with small holdings or allotments. It is the farmers, peasants, and the small-holders who are the members of the co-operative societies, except with regard to the co-operative supply stores, of which many servants and labourers are also members, and the co-operative dairy societies in which many agricultural labourers with small-holdings with one or two cows are also interested. It is not possible to give the number of members in all the different kinds of co-operative societies, inasmuch as the statistics, also the official statistics, give full particulars of the numbers of the herds and flocks, of the cows, pigs, horses, poultry, etc., represented in the societies by their respective owners, but not of the number of the owners themselves. This fact affords a striking proof of the technical view taken of these societies. But enough details

can be given to show how remarkably widespread is the participation in the movement. There were in 1916 approximately the following number of members in the larger societies :—

Co-operative Distributive Societies ..	244,000
Co-operative Dairy Societies .. ..	190,000
Co-operative Bacon Factories .. ..	135,000
Co-operative Egg Export Societies .. ..	45,000
Co-operative Manure Purchasing Societies ..	70,000
Co-operative Feeding Stuff Society, Jutland only .. .. .	44,000
Cattle Breeding Societies .. .. .	23,000
Control Societies .. .. .	16,000

This list, from which many important societies have been omitted, shows that many farmers are members of several societies. Indeed, it will be found quite a common thing for a farmer, especially a peasant proprietor, to be a member of ten or more of these co-operative societies. Besides these Co-operative Societies in connection with agriculture there are 122 Agricultural Societies proper with 104,400 members, and 904 small societies of small-holders (Husmænd) with a total of about 55,000 members. ("Landøkonomisk Aarbog," 1917, published by the R.A.S.D.)

The striking difference in the co-operative movement as it exists in England and in Denmark calls for an explanation. The modern form of co-operation may well be said to owe its origin to the action of the twelve Rochdale weavers in 1844. From that small beginning has grown the mighty co-operative movement in England with its 2500 retail distributive societies, 2,500,000 members, and an annual turnover of £111,000,000, besides the Co-operative Wholesale Society with a turnover of £43,000,000. Nearly all the "co-operative stores" are in the towns, 90 per cent. of the members belong to the labouring classes, in mills, mines, and railways. There are other co-operative societies, in towns and country, but compared with the distributive societies they are of minor importance or influence in their various spheres. The seed of this movement was transplanted into Denmark in the year 1866 by some

philanthropists ; it threw out some straggling shoots in the shape of small supply stores among the labouring classes in a few small towns and soon withered away. But the agricultural population, without any inducement from outside, took up the idea, formed first a number of co-operative distributive societies, thereby learned the lesson and then applied it with ever increasing force to almost all the various branches of their work. Only quite lately has the industrial town population in Denmark shown signs of waking up to the influence of the movement. In England, on the other hand, it is only recently that co-operation has taken hold in agricultural districts, and that co-operative societies have been formed for the furtherance of purely agricultural pursuits.

That the work of the Rochdale pioneers found no followers among the town labourers of Denmark was probably due to the fact that these were without organisation, and that, at the time, the number of them in any town outside Copenhagen was hardly large enough to support and manage co-operative societies, considering that only a proportion of the labourers could be expected to join them. The conditions among the teeming industrial workers in England with their elaborate organisations were quite different. But why did co-operation thrive in Danish agriculture and leave English agriculture cold ? I believe the explanation is to be found in differences in their respective conditions in two directions, viz. a difference in the system of rural tenure, and a difference in the social and educational conditions.

✓ In the first place, nearly all agricultural holdings in Denmark are freehold properties worked by their owners ; and the average size of holdings is smaller, being about two-thirds of the average size of the holdings in England. ✓ Large estates cover only about one-ninth of the cultivated area, one-ninth is made up of small holdings ; more than two-thirds of the cultivated land in Denmark are the freehold property of yeomen farmers and peasants cultivating their own land. ✓ Of the total number of Danish agricultural holdings over 90 per cent. are freehold, while in England the corresponding figure is, I believe, somewhat less than thirteen. ✓ The conditions in Denmark in this respect are very much as they were in England in Cromwell's

time ; his supporters were the yeomen farmers, the same class which in Denmark are the chief supporters and leaders of co-operative agriculture. Ever since the great agricultural reforms at the end of the eighteenth century the proportion of freehold properties has increased, and, by the subdivision of large holdings, the number of holdings, and of late particularly of small holdings, has increased and the average size of the holdings consequently decreased.

The Danish peasants were from ancient times accustomed to manage the affairs of their village communities in common, and had learned to trust one another and to co-operate in many ways. But any attempt to show why Danish peasants were particularly disposed to avail themselves of, and to elaborate further the modern forms of co-operation, would be singularly lacking which did not attribute a very large share to the People's High Schools. Readers who wish to learn about these are referred to a Report to the Board of Education by Mr. J. S. Thornton (Cd. 3537, 1907) who mentions them as the chief contribution of Denmark to educational progress. They are private, voluntary schools for young men and young women between eighteen and twenty-five years of age, who generally pass five winter months and three summer months respectively under the influence of the living word of the teachers and congenial comradeship ; their mental horizon is widened and their life is lifted to a higher plane. Though open to all the schools draw only about 6 per cent. of their pupils from the towns. From the High Schools have sprung the Agricultural Schools, the pupils of which are of the same age and come to the school with a considerable practical knowledge of farming. There are about 70 High Schools and 20 Agricultural Schools ; they are attended by about 8000 pupils annually, for shorter or longer terms ; they are very cheap, the young men are very eager to get an opportunity of going to them, and frequently pass one or even two winters at a High School and the next winter at an Agricultural School, working during the intervening summer months on the land. The State supports the schools, chiefly by bursaries, but leaves them complete freedom as to management and curriculum. The People's High Schools have been described as " hotbeds " of the co-operative

movement; most of the chairmen of committees of co-operative societies, and of the dairy managers have passed through one or more of them. The High School man, with his love of country and his country's history, says Mr. Thornton, will take an intelligent interest in public affairs; 80 per cent. of the members of the Rigsdag in 1901 had been High School pupils.

A committee appointed by the Royal Agricultural Society of Denmark for the propagation of agricultural literature, wrote in September, 1913, to the Society suggesting that a description of Co-operation in Danish Agriculture was very much needed by those who wanted to study this movement as developed in Denmark. It was needed by those who wished to help to promote the further development within the country and by many in other countries who came to Denmark to study the movement or who wished to transplant it, partly and suitably modified, into their own countries. The R.A.S.D., fully approving of the suggestion, wrote to the Central Co-operative Committee, feeling that the C.C.C., "holding in its hand all the threads of the co-operative movement, had more ample opportunities than any single person or any other institution for producing a first-hand description of the co-operative movement in Denmark." The C.C.C. willingly undertook the task which it had had in contemplation for some time, and prevailed upon Mr. H. Hertel, the secretary of the R.A.S.D., an experienced writer with a wide knowledge of the early history and recent development of Danish agriculture, to write the book with the assistance of leading men in the different co-operative undertakings. The publication of the work has been much delayed by the war, but was completed in September, 1917. It is a book of 570 pages.

I have to thank the C.C.C. and Mr. Hertel for the readiness with which they gave their consent to the preparation of an English edition of their work. Such an edition seems quite necessary if the book is to meet the want mentioned by the R.A.S.D. I have shortened the book by the omission of considerable portions which, although of real importance and interest to Danish readers, do not concern English readers. On the other hand, some matters readily understood by a

Danish public, have required fuller explanation, and other alterations, excisions and additions have been made. In this selection of material I have been guided by the experience gained through many years by answering inquiries from Great Britain and Ireland and from the British Dominions. Although fully conscious of many shortcomings, and also of the difficulty of adapting for use in one country what has had a natural development under the different conditions existing in another country, it is my fervent hope that this book may be of service in British lands where the question of co-operation in agriculture is engaging the serious consideration of leading men. It is this hope which has prompted me to bring the work to the notice of the British public.

An Appendix has been added giving various tables compiled and condensed from official statistics and expressed in English weights and measures. These tables should help to show the development which has taken place in Danish agriculture during the last thirty to fifty years with regard to rural tenure, cultivation of crops, live stock, and import and export of agricultural produce.

HARALD FABER.

LONDON, *December*, 1917.

## PREFACE TO SECOND EDITION

THE first Edition of this book has been out of print for two years, during which time many urgent enquiries have shown me that a Second Edition was wanted. But not till I retired, on the 1st of April, 1931, from the position as an Agricultural Commissioner to the Danish Government, which I have held since 1888, did I find the necessary time to bring the book up to date.

The Central Co-operative Committee have had a book, on the same subject as that of Mr. H. Hertel, published in 1929 under the able editorship of Mr. Axelsen Drejer. Although built on somewhat different lines, it contains substantially the same information, but amplified and brought up to date. With the kind permission of the C.C.C. I have been enabled to avail myself of this new source of information, as I have also used the recent official statistical publications.

HARALD FABER.

LONDON, *May*, 1931.

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## INTRODUCTION

“There is in the medley of man’s composition an instinct for co-operation and obedience.”—“The Research Magnificent.”—H. G. WELLS.



## INTRODUCTION

### CO-OPERATION IN DANISH AGRICULTURE IN OLDEN TIMES

THE words of Ecclesiastes: "Is there anything whereof it may be said, 'See, this is new! it hath been already of old time, which was before us,'" may be spoken with truth of the application of co-operative principles to agriculture. Mutual aid among tillers of the soil for direct productive purposes, common duties and common rights concerning various kinds of work, and participation in various benefits, can all be traced back to very ancient times. Co-operation, as practised of old, sprang from the need and the circumstances of the time, and naturally, therefore, was of a character quite different from the co-operation as applied to present-day agriculture. In those early times there was an absence of freedom which brought about a uniformity in the life and labour of the villages, and affected spheres which nowadays we would not like to see withdrawn from private initiative.

What, then, were the conditions under which agricultural co-operation in olden times had its origin?

Among most nations—such as Anglo-Saxon, Teutons, Scandinavians, Slavs, the inhabitants of Arabia, India and China, Peru and Mexico—the land was originally common property. The fields, grass-land, wood-land and waters were used in common by the villagers. Norsemen, Anglo-Saxons and Teutons called the common land mark, almend, almenning mark, or folk-land, and no one had a hereditary or prescriptive right to any part of it; all inhabitants shared it alike. Other real property, however, might be in private possession, such as the farmstead and an adjoining piece of land, called a toft. The peasant could cultivate or use this toft as he liked. It was frequently a fairly considerable piece of land which was

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used for the cultivation of vegetables or as an orchard, for keeping bees, and for grazing the horses when they were resting from work on the common field.

All the land outside the farmyard and the toft was common property, and here the peasant had no individual rights. The use of the common land was arranged as follows. A small part only was used as arable land, the greater part was either left under permanent pasture for the cattle or else was common or woodland. In some parts of the country continuous corn cropping was the custom. In some parts of Jutland a kind of rotation grass cropping was in use, corn (rye, barley, and oats) being sown for five, occasionally for as many as ten years in succession, after which the field was laid down in grass for some years; but on the islands and in the south-east of Jutland the usual mode of cultivation was a *three-field system*, probably handed down from early mediæval times. As indicated by the name it was a three years' rotation, winter corn, then spring corn, and then fallow.

The corn crops were rye, barley, and sometimes oats, but frequently the oats were grown outside the proper field, on the common land lying farther away. On the usual system of tenure the field, called "Vang," was divided into several strips, "Aase," which each year were distributed among the peasants according to the quality of the strips and their position in regard to the sun. The idea was, that nobody should be favoured by having his corn grown in a better part of the field than the others, all should share alike in the use of the good and of the inferior soil. As a consequence each peasant had many, separate, often long and narrow strips in each "Vang." These he was to cultivate in the same manner as the other peasants. His right to graze his cattle in the meadow and to use the common grass-land and wood-land was in proportion to his share in the corn fields. This system of tenure necessitated a kind of co-operation suitable to the conditions. This co-operation in the field work led to co-operation in other spheres, and to mutual aid and support.

The system of tenure influenced the way of building the villages, which were different from those of the present day. The character of the Danish landscape as we see it now, with

detached farmsteads and houses, has come into being during the last century. In former times the farmsteads and houses were built close together in villages of various sizes, from a few to over fifty farmsteads.

Each village community, in Danish called "Bye,"<sup>1</sup> was in reality a co-operative society. It had its own Law, "Bye-Lov," in the so-called "Vide-brev" (Letter of Fines) which contained all those rules which the villagers had agreed upon to regulate their joint action. Here it was described how the fields were to be cultivated and the cattle tended, and so forth. The villagers chose their own Alderman, who was to be the chief of the community for one year, or in some cases for three years. He convened the meetings on the village green, where each man had his special place according to the size of his farm or holding. The alderman opened the meeting, which discussed many questions, such as on what day the work of ploughing, sowing, haymaking, harvesting, hedging or felling of trees should begin; when the cattle should be let loose on the stubble; what remuneration should be paid to the herdsman; when to tether the cattle in the fields after they had been confined to the byres all through the winter; when to turn them out on the common pasture. In case of disagreement a decision was arrived at by a majority of votes. After these and similar matters had been decided, disputes were tried and adjudicated upon, complaints were heard, and fines which had been imposed were paid. The alderman, as the old rules had it, should see that the proceedings were carried on in an orderly manner: "no one shall scold, swear or call his neighbour names. He who does so shall pay for scolding or swearing two skillings and for calling names three marks."<sup>2</sup>

The roads, the village street, the pond, and sometimes a clay-pit or gravel-pit, were all placed under joint management. The village had, as common property, its "village-bull" and "village-boar," which were either kept by one man at a suitable remuneration or by the different peasants in rotation. In many villages the blacksmith was a kind of municipal officer;

<sup>1</sup> This word is found in names of many English towns such as Grimsby and Whitby, showing their Danish origin.

<sup>2</sup> Quotation from a bye-law.

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so also was the schoolmaster ; in a Bye-Lov it was provided that all the villagers should be mutually responsible for his board, whether they had children at the school or not, but those whose children went to school paid such part of his salary as could not be paid out of the fines ; any one refusing to do this was liable to a fine of three marks to be levied, if necessary, by distress and handed over to the village authorities. The old Bye-Lov sometimes dealt with other matters, such as the duty of everybody to attend services in church ; the duties of servants ; the question of fireplaces and damage by fire ; mutual aid ; death ; disease among cattle ; beggars and tramps, and the like. In case of theft the villagers themselves often fixed the punishment.

The village, therefore, was a miniature state within the State, with its alderman, who in the larger villages was assisted by a kind of standing committee ; and its own officers such as bailiff, herdsman, and others. In the district of Aarhus they said, "the village bull and the village blacksmith are our officers." The alderman wielded a considerable power and most Bye-Laws declared him and his helpers to be "holy and inviolable," when performing their duties. The alderman carried "the village staff," and "the village horn." The first was a square rod, on which each farm in the village had its division marked with the initials of the owner or tenant, and if the peasant ever happened to be fined, a notch was cut in his division on the rod. The horn was used for convening meetings or for summoning the peasants in the night in case of fire or on any similar emergency. The alderman kept the written Bye-Laws in his possession ; it was sometimes stipulated that he was to keep himself well versed in the Law, which should be read out at the meetings at least twice a year, or at least such articles of it as had reference to the matters before the meeting, so that all should know the Law. If any one offended he was fined, and if he did not pay his fine punctually it was levied by distress. The amount of the fines was spent on feasting or merry-making and on necessary expenses of the village.

It will be seen from all this, that a well-developed spirit of co-operation and home rule existed in the village communities,

dating back to very old times and handed down from generation to generation. Most of the village affairs were regulated by definite rules, the peasants aiding and controlling one another. Many tasks were performed in common, and few were the undertakings which could be carried on except after a joint decision. A humane spirit prevailed in the villages, and co-operation led to many praiseworthy undertakings within the community and to mutual aid and assistance in hard times, when crops failed, or when sickness or fire ravaged the district. Attendance at church and school was encouraged, the security against floods, robbers, thieves, or wild animals was greater than if each had to fend for himself, and a social life was evolved which undoubtedly had a great educational effect. The conditions at these times were quite different from what they are now. The peasant is now in frequent contact with the world outside his farm and his village, through his connection with the school, the assembly or mission hall, the dealer, the dairy, the slaughter-house, by means of easy and cheap railway communications, daily papers, military service, and the like. None of these things existed in olden times, when the isolation, often considerable, tended to promote a brusque independence, a stubborn adherence to customs and methods handed down from former generations. The social life under the old Bye-Laws—social gatherings, for instance, at which people came together to work in common at spinning or knitting in the winter evenings, or when the men congregated at meetings, or in the summer evenings under the village lime tree—had a salutary effect in counteracting the injurious consequences of the severe isolation and in fostering a feeling of communal local independence, which formed a basis for further development, when circumstances later on made this feasible.

It is beyond doubt that co-operation, joint tenure and working of the soil were for centuries in harmony with the requirements of agriculture, and that they therefore worked for good. But when the conditions during the eighteenth century opened possibilities of progress in agriculture and in agricultural technique, the hampering effects of co-operation gradually came to outweigh its advantages. The drawbacks became irksome and hindered progress; they deprived the

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individual of all inducement to enterprise and restricted his initiative. It became an absolute necessary condition of further development and progress, that the joint tenure and joint working of the soil should cease.

The great rural reforms in Denmark towards the close of the eighteenth century caused the co-operation on the land gradually to disappear. The greatest importance attaches to the Laws of 23rd April, 1781, and 15th June, 1792. These initiated and regulated the enclosures, of which very many were carried out in the decade 1790 to 1800; the joint tenure of land ceased, the villages were broken up, the village land was so enclosed that the fields allotted to each peasant should form one continuous piece of land, lying round his farmstead, which was moved out from the village and rebuilt on the land which became his individual possession, or, in the case of a tenant, his individual holding. An enormous amount of work was accomplished during these years; in 1801 about 5000 peasant farms on the island of Sealand, or about one-third of the total number, had been enclosed; by 1802 about one-half of all the land in Denmark had been enclosed; by the end of the thirties only one per cent. of the land was still left in joint tenure, and the last of this has now been long since enclosed.

It was the enclosure of the land and the emancipation from villenage which terminated the old and introduced the new epoch, the emancipation as far as the personal condition of the peasants was concerned, the enclosure with regard to the agricultural conditions. It was the enclosure and the moving of the farmsteads from the villages out to the enclosed holdings which caused the village life under the former co-operative system gradually to disappear. No wonder that the peasants in many cases grieved to see the old time co-operation die away. They had been born and bred under its influence, had shared each other's sorrows and pleasures, they had learnt to value the means of mutual aid and support.

More than half a century was destined to pass before co-operative principles again came into play to any great extent in Danish agriculture. Naturally they had to be adjusted to the altered conditions. The old co-operation, as

already explained, was a condition of unfreedom causing a dead level of uniformity in the life and labour of the villages. The new scheme is founded on free organisations, which sprang from the claims of practical life, and, above all, from the claims of the peasant to participate in the advantages enjoyed by farming on a large scale. Co-operation in agriculture was not quite extinct during the interval between the cessation of the joint working of the land and the coming into existence of the first modern co-operative undertakings. In the beginning of the nineteenth century a number of mutual cattle insurance societies had been formed—nay, it is even quite possible that societies of this kind were already in existence in the eighteenth century and that they had been carried on quite informally, with handwritten rules and without any keeping of accounts, each loss being at once covered by assessment between the members. These old societies will be mentioned in a later chapter dealing with insurance societies.

The impulse which gave rise to the first co-operative action under modern forms was the necessity of borrowing money on long terms for agricultural purposes, and the first problem for which a solution was attempted on co-operative lines was the regulation of agricultural credit on the security of the land by the formation of Credit Associations. Before describing the modern Danish co-operative undertakings it will be of historical interest to mention briefly, first the old institutions which have existed in Germany for 150 years and which have served as model for Credit Associations established both in Denmark and in several other countries, and then the co-operative movement in England and in Germany during the first half of the nineteenth century, the results of which have had a helpful influence on developments in Denmark and in other countries.

#### THE FIRST CREDIT ASSOCIATIONS

So long as European agriculture was carried on under mediæval conditions farmers paid their rates and taxes, wages to their servants, and other charges, in kind, *i.e.* either in the form of work performed, or in produce, such as corn, butter, bacon,

and so forth. They mostly produced themselves what they used and consumed. What they bought was very little, and the small amount of ready cash which they required they obtained by the sale of farm produce. As payment in kind was gradually replaced by payment in cash, the need of ready capital was felt more and more strongly by farmers; progressive agriculture required better and more implements, and the rise in the standard of living caused a demand for improved dwellings, furniture, garments, and utensils, all of which had to be paid for. This transition from dealing in kind to dealing in cash took place in European agriculture chiefly during the eighteenth century. Farmers tried to raise loans, and as there were no institutions in existence for this special purpose, they had recourse to private lenders, who soon learned to take advantage of the farmers' lack of knowledge of financial affairs. In many countries special businesses were started for the purpose of exploiting the farmers' need for ready cash. Professional lenders exercised great ingenuity in evading the laws against usury and in arranging the loans so as to fleece the farmers as much as possible. They stipulated, for instance, that the loan with interest and costs should be repaid in one lump sum; contrary to the natural requirements of an agricultural undertaking, they would only lend for short periods, and fixed the day of repayment so as to fall at a time when farmers were known to be most in need of cash. The renewal of the loan was therefore frequently an absolute necessity for the farmer, but he had to pay cruel charges for the accommodation.

As early as the eighteenth century the indebtedness of the farmers became in many countries so serious that several states tried to repress usury. The Empress of Austria, Maria Theresia, issued in 1751 some very severe laws against usury, in which it was provided, in order to eradicate "the vice of usury," that not only the usurer but also his victims should be severely punished, and that high rewards should be paid to the informer. But all this was in vain; the stricter the laws, the greater the cunning of the usurer in circumventing them.

After the Seven Years' War (1756-63) the conditions were particularly disastrous in the Prussian province of Silesia, where the ravages of war had been severely felt. The landed

estates were without crops and without stock, sometimes the very buildings had been destroyed, and the owners had been under the necessity of raising large loans, which had been paid them in bad money that was under weight, but which the owners had to repay in good money of full weight. The interest was at least 10 per cent., to which must be added 2 or 3 per cent. brokerage. It was a matter of the greatest importance to extricate the landowners from the meshes of the usurer, and to furnish on reasonable terms the large loans of which they stood in need. A merchant in Berlin, named Buring, evolved a plan to help the landowners by forming Credit Associations, with power to issue bonds combining the security of a mortgage with the negotiability of stocks and shares. A larger or smaller group of landowners combined and pledged their estates jointly as security for whatever loans any of them might contract. Buring submitted his plan to the King of Prussia, Frederick II., who at once perceived its ingenuity, and ordered his minister of state, von Cramer, to make a report on the matter. The deliberations soon led to action, and by the 29th August, 1769, the first Credit Association, called "Die Schlesische Landschaft," had received the Royal sanction. Four other Credit Associations, or "Landschaften," were subsequently formed in four other Prussian provinces, and these five old Landschaften ("fünf alte Landschaften") became the pioneers of the system of long credit on landed security.

Co-operation in these first Credit Associations was compulsory, in the sense that the owner of every landed estate above a certain size within the province and belonging to the nobility was compelled to become part surety for the obligations of the association independently of whether such owner had contracted a loan or not. The Associations were to some extent managed on co-operative lines, inasmuch as the members managed the operations through a committee elected at a general meeting, but the Associations were under strict supervision on the part of the State. All moneys belonging to minors and to public institutions and all trust moneys had to be invested in the Bonds of the Associations ("Pfandbriefe" or "lederne Briefe") which were printed on parchment. The

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Bond stated the name of the estate to which the loan was granted, it gave right of foreclosure of the mortgage on that estate, and the other estates in the province were only collateral security for the loan.

Every estate was assessed by officers of the Association, and loans were granted only up to a certain proportion, generally one-half, of the amount of the assessment. The borrower received, instead of ready cash, Bonds to Bearer, which he himself had to sell in the open market. The borrower was entitled, on giving six months' notice, to warn the committee that he required the Bonds, issued to him, to be exchanged for cash. It became the general rule for the borrower to give this notice immediately on receipt of the bonds, and the committee, therefore, had to get the bonds sold within the six months or to redeem them out of the sinking fund. It had been taken for granted that the bonds were such a good investment that it would be an easy matter for the committee to sell them, but this was often far from being the case. At first the borrower paid interest direct to the buyers of the bonds; later on the Associations undertook to intervene between creditor and debtor. In spite of these and other shortcomings of the first Credit Associations they exercised a great influence. The first of them, the Silesian Landschaft, met the need of agricultural credit in the province; it secured loans on reasonable terms at 5 per cent. interest. The importance of this association is proved by the fact that in 1782 it had already lent the sum of 16,880,000 thalers (£5,500,000 in round figures), which for that time was a very large amount. King Frederick II. estimated that more than 400 noble families, estate owners, had by means of this "Landschaft" been saved from economic ruin.

It goes without saying, that the Associations gradually gained experience and improved their business method. Compulsory membership ceased, the Bonds were made payable by the Associations on demand, the borrowers were given facilities for repaying the loans by yearly instalments, and the right of contracting loans was extended to other landowners than noblemen, either by the "Landschaft" being opened to such or by special Associations being formed with a wider clientèle.

The co-operative scheme of granting loans, introduced by these Prussian "Landschaften," soon spread to other countries, to the Baltic provinces in 1802-3, to Slesvig and Holstein in 1811, Mecklenburg, 1818, Posen, 1822, Poland, 1825, etc. They have been the model on which the Danish Credit Associations have been formed.

#### THE FIRST ENGLISH CO-OPERATIVE DISTRIBUTIVE SOCIETIES

In England, too, we can trace in the eighteenth century the first beginnings of modern co-operation, especially the forerunners for the Co-operative Distributive Societies. Although the English "Co-op. stores" draw by far the majority of their members from the working classes in the towns, they have nevertheless had a great influence on the Danish co-operative stores, which are chiefly supported by the rural population. A short account of the first English Co-operative Distributive Societies and their forerunners may appropriately find a place here.

The latter half of the eighteenth century was a period during which English industry attained to great prosperity, when many inventions in machinery transferred production from the home to the factory, but when nevertheless employment was uncertain, working hours were long and wages low, and the conditions under which factory operatives lived were often very sad and hopeless. The distribution of the necessaries of life among them was ill-organised, adulteration was rife, and the profits of middlemen were excessive. Working men, therefore, attempted, with the assistance of a number of philanthropists, to improve their condition by the introduction of a system of co-operative purchase.

As early as 1769 some weavers in Fenwick, south of Glasgow, combined for the purpose of buying certain goods, chiefly oatmeal. A similar attempt was made in 1777 by the weavers of Govan, near Glasgow, who formed a society which still existed in 1909 but refused to associate itself with the modern Scottish co-operative stores. At Mongewell in Oxfordshire a society was formed in 1794, which is sometimes, but incorrectly, spoken of as the first co-operative store; it

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was, like several other shops which were started in the following years in various towns, a philanthropic undertaking for the purpose of supplying the poorer classes with goods at cost price, and had no relation to nor influence on the later co-operative movement. One society, among a few formed in the beginning of the nineteenth century, deserves special mention. It was formed in 1812 at Lennoxton in Scotland, and was registered in 1826 as a Friendly Society. In its rules was provided that the annual surplus should be divided among the members in proportion to their share capital, but with this very important proviso, that if a member's total annual purchases were of less value than his share capital, he should not be entitled to a part of the surplus corresponding to his share capital, but to a bonus corresponding to his purchases during the year. We find here the germ of the celebrated principle of the distribution of the surplus which was adopted by the Rochdale pioneers, and has held its own ever since.

These various undertakings, to which might be added several small co-operative flour mills, the first in Hull, 1795, remained small, had very little influence, and caused no stir and mostly died out. ✓The man who brought the impulse to a co-operative movement of lasting and growing effect, and who therefore is called the father of voluntary co-operation, is Robert Owen, born in Newton, Wales, in 1771. At the age of nineteen he became a manager of a cotton mill in Manchester, and there he became acquainted with the miserable condition of the mill hands. When he married the daughter of a Scotch cotton manufacturer, and in 1797 took over the mill in New Lanark, he managed so well that he soon became very wealthy. His 2500 hands lived in bodily and mental misery. Owen, firmly believing that the human character is a product of the conditions under which the individual lives, resolved to improve the lot of the workmen and their children by building schools, abolishing all public houses, encouraging cleanliness, building better dwellings, and by opening shops where good and cheap goods could be bought for cash. These goods, purchased wholesale and sold at cost price with the addition only of the cost of transport, could be retailed at prices 25 per cent. lower than those hitherto

in force, and were of better quality. All these efforts met with success, and people came from all over Europe to New Lanark to see and to learn.

Owen's work of reform was ere long extended to wider fields. His first attempt to introduce co-operation was in connection with a scheme which he submitted to a Committee of the House of Commons. His idea was to have the country divided into districts of 1000 acres each, with a population in each district of about 1200 persons, a central building was to be erected for their use with common kitchen, dining-hall, schoolroom, library and lecture hall. The members of each of these communities would, he thought, feel and act as members of one family which would induce thrift and kindness; each member was to take an equal part in the work and equal share of the surplus. He formed a society to put this scheme into practice and in 1821 started the first co-operative periodical, *The Economist*. But disagreement between Owen and the other leaders arose to hamper the progress of the society, which became little more than a co-operative store. An attempt to carry out his social reform on a large scale was tried by Owen in Indiana, U.S., where he bought a large tract of land; but it failed, and Owen returned to England, where his ideas had begun to gain ground among the working classes. Supply stores, loan societies, sick clubs, and benefit societies were formed by labourers, and even some factories, such as a cloth mill, a dye work, a candle factory, and so forth. An attempt was also made to apply the co-operative principle to agriculture. But most of these societies had ulterior aims beyond their immediate practical object, and some of these aims were far-fetched and often quite impossible of realisation. Their organ, *The Co-operator*, proclaimed their final aim to be the purchase of the land and a communistic existence, and a resolution confirming this to be the aim was carried at a co-operative congress which was held in Liverpool in 1832. Voluntary co-operation was considered by Owen and his disciples as a means towards an end which included abolition of all private property, religion, marriage, and legal punishment, acknowledgment of the irresponsibility of the individual, and the introduction of a new system of education. As the voluntary

societies were quite incapable of carrying out such far-reaching reforms, the movement gradually died out ; of the 700 societies represented at the Co-operative Congress in Liverpool in 1882, there were, a few years later, only four left ! Robert Owen died in 1858, working to the last for his idealistic and communistic reforms.

In spite of all their evident shortcomings these attempts during the " twenties " and " thirties " of last century were not without great influence, and many of their ideas have survived. The modern co-operative movement is, therefore, indebted to Robert Owen, and the British Co-operative Congress in 1901 acknowledged this by voting £10,000 for a monument in connection with a hostel with library and reading-rooms to be built in Owen's native town of Newton.

The older co-operative undertakings in England and the first co-operative stores were used as a means for propagating socialism. The surplus was employed for socialistic propaganda or for Building Societies or similar purposes ; but most of the undertakings died out.

In the year 1844 a new and lasting impulse was given by the celebrated *Rochdale Pioneers*, who formed a Co-operative Distributive Society of such admirable organisation and introduced such new business principles, that it became the model for many similar societies, first in England and Scotland and later on in most other countries, and among them in Denmark. The millhands in Rochdale, like many other industrial workers, led a wretched existence, insufficiently nourished and under constant dread of unemployment. In November, 1843, twelve poor flannel weavers decided each to contribute 2d. per week for a year, which would enable them at the end of that time to buy a sack of flour. Later on sixteen more joined, and they scraped together a sum of £28. They sought advice from Owen's colony at Queenswood, and then formed a small Co-operative Distributive Society which opened a shop in a poor street in Rochdale, on the 21st December, 1844. At first the store kept only flour, sugar, and butter, and was open only for two evenings a week.

The aim of the Rochdale weavers was primarily to improve the economical and social status of the members. For this

purpose a capital was raised, by each member buying a share of one pound Sterling, in order to keep a store for the sale of provisions, clothing, etc.; to provide better houses; to manufacture certain goods for the purpose of securing employment for members who were either unemployed or suffering from repeated reductions of their wages; for the latter purpose the society might also rent or purchase land to be cultivated by members. A further aim was the foundation of a communistic colony according to Owen's plan. Fortunately, however, the practical pioneers devoted their attention to the solution of the first part of their programme, viz. to set up a supply store. Unadulterated goods of full weight were to be *sold at ordinary trade prices* for cash; each member, whether male or female, was to have one vote; the *annual surplus was to be divided according to the purchases* and not according to share capital. These principles have proved to be of great vitality and have materially promoted the growth of the movement.

The Rochdale Pioneers' store soon began to deal in other than the above-named three kinds of goods; in 1851 a flour mill was built, and in 1855 a cotton mill. Other distributive societies were formed in England and Scotland on the same principles; in 1851 there were already 130, in 1861, 450, in 1881 about 1000, and at the present time there are about 2500 with 2,500,000 members, and an annual turnover of about £111,000,000 and an annual surplus of about £12,000,000.

In 1868 forty-five co-operative stores in the North of England combined for the purpose of wholesale purchasing, and established a business in Manchester, which in 1872 was extended to the whole of England under the name of The Co-operative Wholesale Society, membership of which is confined to co-operative retail distributive societies, to which shares in the business are allotted in proportion to the number of their members and a corresponding number of votes. The annual surplus of the C.W.S. is divided among members in proportion to their purchases. In 1868 a similar C.W.S. was formed for Scotland with its headquarters in Glasgow. These two Wholesale Societies are enormous undertakings with branches in many towns and representatives in many foreign countries,

employing their own ships for the transport of goods, doing business of almost all kinds, having their own mills, slaughter-houses, bakeries, factories for the production of boots, clothing, tobacco, etc., their own bank, printing plant, their own monthly paper, their own tea plantation in Ceylon, etc., etc. The turnover in 1915 was £48,000,000, with a surplus of £1,087,000.

The "Co-op. Stores" in Great Britain find 90 per cent. of their members among the working classes, mostly among the skilled artisans in mills and mines and railways, and the leaders of the movement are almost exclusively drawn from these classes. The movement has had and still has a great influence in raising members both economically and intellectually, and it has had a considerable effect on social development in other European countries.

#### THE SCHULZE-DELITZSCH AND THE RAIFFEISEN CREDIT SOCIETIES

Although these German co-operative credit societies have only been imitated in Denmark quite lately (1915) they deserve mention, as they have played an important part in the early co-operative development in other countries.

Hermann Schulze (1808-1883) was a magistrate in the small town of Delitzsch in Prussian Saxony. He had great sympathy with the labouring classes and the small dealers and artisans, was familiar with the co-operative movement in England, and had, as the result of his studies in economics, arrived at the conclusion, that neither the mediæval system of Guilds nor the modern socialistic theories could elevate these classes; but that, with some assistance, they could help themselves by voluntary mutual aid and by securing a working capital on a sound business basis. At his instigation half a hundred small shoemakers combined in 1849 for the purpose of buying wholesale leather, which was afterwards distributed in smaller quantities to the individual partners, who were jointly responsible for the payment. A similar arrangement was made by joiners. The following year Schulze formed in Delitzsch a new society of 100 artisans, a credit society which granted loans at 5 to 10 per cent. interest to the members,

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## CO-OPERATIVE DISTRIBUTIVE SOCIETIES

As the various kinds of co-operative undertakings in Denmark will be mentioned in chronological order the Credit Associations should head the list, the first two of these being founded as early as 1851. But for various practical reasons it has been decided to reserve them for a later chapter. They differ in several respects from the other co-operative undertakings. While the other co-operative societies have been formed and managed, and in many instances have been conceived, by practical farmers belonging mostly to the middle or lower strata of society, it was politicians, scientific economists and large estate owners who introduced the Credit Associations.

The Co-operative Distributive Societies were, after several feeble, independent attempts as far back as 1851, introduced into Denmark as direct imitations of the English co-operative stores of the Rochdale type, and they were introduced by a clergyman, the Rev. Hans Christian Sonne (1817-1880), for the benefit of the poor working-class people in his urban parish, Thisted. Pastor Sonne saw the necessity of improving the material well-being of his poor parishioners before he could expect to gain their attention for spiritual and intellectual teaching. He told the working men about the English co-operative stores, and in 1866 induced them to form the first society for the purchase of the necessaries of life, called The Society of Working Men in Thisted Town, which adopted the Rochdale principles: sale at current prices and for cash, dividing the net surplus according to members' purchases.

For the first few years the movement spread very slowly, and in a way typical of social development in Denmark, mostly in rural districts, helped in a few instances by men of the upper classes. Among Sonne's helpers should be mentioned Dr. Ulrik and V. S. V. Faber, who in 1868 formed a society in

Copenhagen and from 1868 to 1876 published a paper, *Arbejderen* (*The Working Man*), to encourage co-operation between those in the lower strata of society. Leading men, including the Rev. Mr. Sonne, called two meetings in Copenhagen, in 1871 and 1874, in order to discuss with representatives of the existing societies and influential men of all classes (the Prime Minister, Count Holstein, was present at the first meeting) what could be done to further the movement. There were in 1874, 92 societies. A central society was formed in 1871, chiefly through the exertions of V. Faber, for the purpose of joint purchasing, but it proved a failure; instead of forming a co-operative wholesale business, as in England, a merchant was employed to purchase goods for the co-operative stores at a fixed commission. The result was a retrograde movement, and 37 societies were dissolved. The turn of the tide came when Severin Jørgensen placed his energy, his initiative, and his idealistic enthusiasm at the service of the Co-operative Distributive Societies. He was born in 1842, and is still one of the leading men in Danish co-operation. He began as a small dealer in a village; in 1868 he helped to establish a co-operative store in a neighbouring village, having given up his own business to manage another co-operative store in Jutland. He did this so successfully that other stores joined his for the purpose of buying wholesale. This wholesale business in Jutland gradually increased, and in 1884 a similar one was established in Sealand. In 1896 these two Associations of Co-operative Societies were amalgamated to form a central society, called "Fællesforeningen for Danmarks Brugsforeninger," or the Co-operative Wholesale Society of Denmark, with headquarters in Copenhagen.

The number of co-operative stores increased but slowly until in 1885 the political situation indirectly helped to forward the movement. There was a considerable political agitation over a question affecting the Danish constitution, and the peasants, being mostly Liberals, saw in the "co-op. stores" a means of making themselves independent of the merchants, who were generally in the opposite political camp. Another impetus was the formation of the central society in 1896. From 1885 to 1909 as many as fifty new co-operative stores were formed every year.

An official statistical publication<sup>1</sup> gives the number of Co-operative Distributive Societies in Denmark in 1914 as 1562 with 244,000 members, which means that every eleventh inhabitant in the country is a member (as compared with every fifteenth in England and every twenty-ninth in Germany). The collective turn-over was £5,715,000, with a surplus of 6·2 per cent. of the turnover. Of the societies 1187 dealt also in corn, feeding stuffs, manures and seed; 1470 were in rural districts, 17 in Copenhagen, and 75 in provincial towns. By an inquiry in 1910 the Wholesale Society found<sup>2</sup> that 32 per cent. of the members were peasants, 41 per cent. small-holders ("Husmænd"), and 27 per cent. labourers or people of their class. That this co-operative movement made so little progress in the towns, where after 34 years only seven co-operative stores existed, while it was taken up so vigorously by the rural population, is only a proof among many that the rural population in Denmark is more wideawake than the artisan classes in the towns. This, again, is explained by the influence of the People's High Schools and the Agricultural Schools. All these are private schools aiming at opening out the minds of the young men and women in the country districts, fostering love for their country, its history and language, for religion, love for and understanding of their daily work, fitting them for taking part in local government and national politics. Among the peasant proprietors many came forward to be leaders of their local "co-op. store," whereby they gained experience enabling them to extend the co-operative movement over a wider field and to set it ever bolder aims. No similar awakening and development took place in the towns, and the local papers and the tradespeople naturally looked askance at the "co-op. stores," and opposed them.

Most of the existing Danish Co-operative Distributive Societies have adopted the following principles: (1) Sale at usual trade prices; (2) buying and selling for cash; (3) dividing the surplus among members in proportion to their purchases; (4) joint liability; (5) membership open to everybody; (6) each member one vote; (7) members to manage and control

<sup>1</sup> "Statistisk Aarbog," 1915, Tabel 114.

<sup>2</sup> "Fællesforeningens Aarbog," 1910, p. 134.

the business through a committee elected at the general meeting and auditors elected outside the committee.

According to Danish Law a dealer or merchant must have a licence to trade, and all trading firms must be registered. It was the intention when the Law on Trading of 29th December, 1857, was amended in 1873, to require all co-operative stores to have a licence, but V. Faber urged with effect that this should depend on whether they supplied the general public or only their own members, and this view prevailed. A co-operative store is not considered "a trader" when it (1) distributes goods only to members; (2) buys for the joint account of members, these being severally and jointly liable for the debt; and (3) divides the surplus among members. A trader's licence is not very costly. It is therefore peculiar that only 577 or about one-third of the co-operative stores had such licences which would enable them to trade with others than members.<sup>1</sup> In most other countries almost all co-operative stores are free to sell to anybody; it is so in England and in Germany. This peculiar Danish feature is caused by the above-mentioned statute, which is really a survival from somewhat mediæval times. In order to protect the dealers and artisans in market towns, no dealer may trade within 7 miles of the market place, and no "huckster," second-hand dealer, nor artisans of certain trades may trade within about 5 miles of the market place. A co-operative store dealing with others than members, being a trader, cannot exist in these "protective belts" around market towns, and therefore all co-operative stores within these "belts," which comprise a very large part of the country, are obliged to be "purely co-operative," and deal only with members. Several market towns have during later years abolished the "protective belt," and the whole statute is likely to be soon repealed. If a co-operative store sells spirit, beer (except temperance beer), wine or cider, it must hold a separate licence (only off-licences are allowed them), and 963 co-operative stores of the 1562 in existence in 1914 held such licences.

The Co-operative Wholesale Society of Denmark, formed in 1896, elected as its first chairman Severin Jørgensen, who acted as such until 1913, when he retired on account of age, and

<sup>1</sup> "Statistiske Efterretninger," 1915. No. 7.

was succeeded by L. Broberg, member of the Upper House of the Rigsdag. The Wholesale Society has branches and warehouses in twelve provincial towns, besides its head offices and warehouses in Copenhagen. The Society has built several factories, for roasting coffee; making chocolate, confectionery, tobacco and cigars; a rope walk; a soap, a mustard, and a margarine factory; a chemical works; a spice mill; a hosiery factory; a factory for men's ready-made clothing; a cycle factory; a share in a shoe factory; its own import of tea. Only Co-operative Distributive Societies can be members of the Wholesale Society. In 1916, 1537 societies were entered as members, having themselves 240,000 members; the Wholesale Society had a turnover by sales of £4,700,000, with a net surplus of £398,000, while the total turnover of the various factories was nearly £1,000,000; the reserve fund was £315,000, the book value of the buildings £280,000.

A special feature of this Society, which began in the eighties a joint purchase of seed and manures to members, has in later years reached a development unknown outside Denmark. It is the work done to further and improve the production and sale of guaranteed seed from improved selected strains of various agricultural plants, such as roots, clover, grasses, and the like. In 1904 the society bought a piece of land at Lyngby near Copenhagen, 18 acres in extent, for comparative trials of the various kinds of seed bought and distributed to members, and in order to produce improved strains by selection. In 1911 a farm of 177 acres near Lyngby was rented for the purpose of producing seed from selected strains. Since 1913 a scheme of co-operation has been in force between the Co-operative Wholesale Society and a "Society for Supplying Seed, formed by the Associated Danish Agricultural Societies," which has had a very considerable influence on the production and sale of seed in Denmark. The latter Society, which was founded in 1906, undertakes the production under control of seed from selected strains, while the Wholesale Society takes over the sale of all seed produced by the other Society. A Committee of the Agricultural Societies control the production and the sale, and may even decide which kinds and strains of seed are to be



## CO-OPERATIVE DAIRY SOCIETIES

FROM the time when the first Co-operative Distributive Society was formed in 1866, until the co-operative movement sent forth its next offshoot, when the first Co-operative Dairy was built, a span of sixteen years passed. During these years Danish agriculture began and almost completed the great change caused by the altered conditions in the agricultural world. This change had a great influence on the co-operative movement.

After the long and severe crisis in the twenties of last century, Danish agriculture began a steady if slow process of recovery. It emerged poor, but not exhausted, from the catastrophe; the agrarian reforms at the end of the eighteenth century had stood the enormous strain, and the agricultural classes had just reason to be proud of the development made during the first fifty years after the emancipation of the peasants. The area grown under corn was increased and the marling, draining, and fallowing of the land resulted in larger crops being produced. The summer feeding of the cattle had been improved by laying the fields of the last corn crop down in clover and grass, thereby providing a green crop ready as soon as the corn crop had been carried. A better rotation of crops was introduced from North Germany, and there was progress both technical and economical; especially was this the case after the first war with Germany, 1848-50. After the repeal of the English Corn Laws, Danish agricultural produce found a market in Great Britain and realised higher prices; many farms hitherto held on lease were bought freehold; the free constitution of 1849 with its extensive franchise imparted fresh energy. The chief feature of agriculture at that time was corn growing; by physical means (as opposed to chemical and biological means) the growth of the corn crops was stimulated,

which caused an exhaustion of the capital present in the soil in the shape of plant nutriment. The cattle were ill-nourished ; during winter they were fed on hay and straw only. By degrees the ill effects of this system became apparent. A considerable difference in the corn crops was observed between the ordinary farms and the better managed estates where the impoverishment of the soil was compensated by the greater quantities of more valuable farmyard manure resulting from keeping more stock and feeding them more liberally. Several intelligent men on large farms set the example ; as the stimulating effect of marling gradually decreased and the necessity of replacing by manure what was taken out of the soil became more and more pressing, the advantages of a larger stock of cattle and of tending and feeding them better during the winter became evident to more and more farmers. This was the beginning of the new, the modern, system in Danish agriculture. The change began in the sixties, was continued in the seventies, and completed in the eighties. The basis of agriculture was transferred from corn growing to dairy farming. Instead of being robbed the soil was now enriched.

This change took place at a highly opportune moment, when the great revolution of the seventies came to alter the commercial conditions of agriculture in West Europe. Corn from the East and from overseas flooded European markets. Large tracts of fertile land were brought under the plough in North and South America, in India and Australia. Soon afterwards also animal produce, live animals and meat, were sent to Europe from America, Australia, and other countries in rapidly increasing quantities. This revolutionary change was due in a large measure to the development of the means of transport. Large railway lines opened up new land, improved steamships brought continents nearer by many days, freights were reduced to a small fraction of what they used to be. The result was a competition with the whole world hitherto quite unknown in Europe, and this was particularly felt by European agriculture. All the countries in Europe, with the exception of four, the United Kingdom, the Netherlands, Belgium, and Denmark, tried to stem the fall of prices by imposing high import duties on agricultural produce.

The fall in prices is indicated by the following Index numbers according to Sauerbeck.<sup>1</sup>

				Vegetable food.	Animal food.
1867-77	...	...	...	100	100
1878-87	...	...	...	79	95
1888-97	...	...	...	62	81

Danish agriculture felt this very severely. But as the reduction in price was considerably greater in vegetable food than in animal food, and as the price of corn was the first to be affected, while it took some years before it was found practicable to ship perishable animal products from far countries to the markets in Europe, the inducement to accelerate the change from corn growing to dairy farming was considerable. And right pluckily and resolutely did Danish agriculture effect the change, which was accomplished before the end of the eighties.

The change of system is seen in three directions: the live stock was increased; the yield of the different kinds of corn was increased; the export and import of produce changed character. The number of domestic animals were:—<sup>2</sup>

				Horses, 1000.	Cattle, 1000.	Cows, 1000.	Pigs, 1000.	Sheep, 1000.
1871	...	...	...	317	1239	808	442	1842
1881	...	...	...	348	1470	899	527	1549
1893	...	...	...	411	1696	1011	829	1247

Hand in hand with this increase went an improved feeding of the animals. The home-grown corn was insufficient, consequently an import sprang up of maize from America, barley from the Black Sea, oil cakes from many different places, bran, and other feeding stuffs.

The increased production of better manure resulted in larger yield of corn.<sup>3</sup>

<sup>1</sup> *Journal of the Royal Statistical Society.*

<sup>2</sup> See Appendix II., Table 10.

<sup>3</sup> See Appendix II., Table 9.

AVERAGE YIELD IN BUSHELS PER ACRE.

	1875-79.	1885-89.	1890-94.
Wheat ... ..	30·9	35·9	36·5
Rye ... ..	24·1	24·4	25·5
Barley ... ..	26·9	28·1	29·8
Oats, white ... ..	28·9	34·0	32·6

The change in the character of the export and import, consisting in a rapid increase of the export of animal produce concurrently with a reduced export of corn which soon became a net import, is shown in the following table giving values, in £1000, of the average yearly net export :—<sup>1</sup>

	Live animals.	Animal produce.	Corn, flour, and mill offals.
	£1000.	£1000.	£1000.
1866-70 ... ..	833	667	2111
1876-80 ... ..	2415	1143	1496
1886-90 ... ..	1924	3704	—686 (net import)

*The change from corn growing to dairy farming created the conditions for an agricultural industry in connection with which the co-operative movement found new scope for development and blossomed forth in co-operative dairies, slaughter-houses, societies for buying and selling, and so forth. This change and the new development also influenced the character of the farmer; he became more intelligent, with a wider outlook, with a better knowledge of his profession. The slow and dull-witted peasant, with his stubborn adherence to traditional methods, gradually disappeared.*

The branch of animal industry which was first developed was butter and cheese making. Although butter and cheese had been made to some extent from very ancient times they had not been produced in large quantities. As late as the end of the seventeenth century butter and cheese for the army

<sup>1</sup> See Appendix II., Table 12.

were imported from Holland ; a hundred years later Denmark still had a net import of butter, and even far into the nineteenth century peasants made only enough for their own use, except sometimes during the flush of milk in the early summer-time. In the thirties and forties of last century dairying on a larger scale was introduced by farmers from Holstein, who bought Danish estates or took them on lease, and better methods of dairy work spread to other estates and to a few of the largest peasant farms, often through the instrumentality of dairy-maids from Holstein. From the middle of the century efforts were made to improve the butter-making on peasant farms. In 1860 the Royal Agricultural Society of Denmark appointed a young man with a university training to study and to teach more rational methods in dairy work. This gentleman, who became subsequently the professor of Dairy Science at the Royal Agricultural College in Copenhagen, was Th. R. Segelcke. By exhibitions, demonstrations, lectures, by having young men and young women taught at the best dairies, and by similar means, butter making was improved in the estate dairies and also gradually in the homes of the peasants. But it was a great objection to the peasant butter that it came in so small quantities that, were it ever so good, it was useless for export by itself, and most often the quality was far from good. It was delivered to the local dealer, who gave groceries in exchange, or it was sold to butter merchants, who graded, milled and exported it. Even the finest peasant butter was therefore of less value than estate butter because it was not marketable ; it had to be worked before it could be sold for export. At the butter exhibition held in connection with the International Agricultural Exhibition in London, in 1879, in a class for salt butter, the second prize was awarded to a sample of butter produced by a Danish peasant whose whole herd consisted of six cows—and still he could not obtain at home for his butter the price which was paid for the larger productions of inferior quality from estate dairies.

The invention of a mechanical cream separator—the first separator with continuous working was constructed by L. C. Nielsen, and was at work in Copenhagen in 1878, the next year brought Dr. de Laval's Swedish separator—altered the

conditions in the dairy, and opened out the possibility of an industry on a large scale, and facilitated the application of co-operative methods.

Some form of co-operation in cheese-making has been practised in Switzerland from very ancient times. In this instance the cattle from a number of farms are brought together in the summer to the pastures in the Alps where cheese is made from the collected milk, and the proceeds distributed between the farmers in proportion to the yield of his cows as measured twice during the season. In other districts in Switzerland farmers have built factories for making butter or cheese, to which they daily bring their milk together, morning and evening; the milk is measured and credited to the farmers according to quantity, and of the mixed milk butter or cheese is made. A Danish writer, in 1820,<sup>1</sup> in describing these factories, pointed out the advantages such co-operation brought to the small farmers, and he further mentioned that where these factories were found, the number of cows increased, the breed of cows was improved, the milk was better treated and the proceeds from dairy farming increased; even the fields were better cultivated. The system spread into the neighbouring districts in France. Another Danish writer, N. Tillisch, described in 1871 the American creameries,<sup>2</sup> the first of which was said to have been erected in 1851. Originally a creamery was owned by one man, who bought the milk from the farmers; but gradually arrangements were made so that the farmers themselves owned the creamery, which was run for their joint account, and this system Tillisch recommended Danish farmers to adopt.

A plan for improving the butter made from the milk from peasant farms by collecting the milk to be worked at one place was submitted to the Royal Agricultural Society of Denmark as early as 1852, and it pointed out that this could be done on co-operative lines, the peasants being the owners of the factory and sharing the proceeds. The first dairy for the manufacture of butter from milk bought from the farmers was made in 1863 in Marslev, and others followed; but these did not succeed.

<sup>1</sup> Ravert, in "Nye Landøkonomiske Tidender," 1820.

<sup>2</sup> "Tidskrift for Landøkonomie, 1871."

The milk delivered was often badly treated, and by the methods then in use it was difficult to raise the cream from collected milk, so that too many pounds of milk were used to produce one pound of butter. The introduction of the cream separator altered this, as the separator is able to extract the cream even from collected milk better than it could be done from freshly drawn milk by the older methods. Estate dairies bought separators and began to buy milk from neighbouring farms; or farmers combined to form joint stock dairies, buying milk. From about 1880 many dairies were started by private enterprise for making butter from milk bought by contract; but they often gave but a poor result, particularly where they were worked independently of a farm. As the milk suppliers were not interested in the success of the undertaking, they were not careful in the treatment of the milk; the skim milk was difficult to dispose of; for such and many other reasons these collective dairies did not succeed. It was the Swiss and American forms of co-operative production which appealed to Danish farmers when, in the seventies, they discussed the important problem of how to treat the milk. Even as late as 1883 and 1884 there were serious debates at large agricultural meetings as to whether it was better to have a butter blending mill established in each village, where the farmers' butter could be blended; or whether the milk from the different farms should be brought together to one dairy, there to be worked into butter.

✓The solution was found by the peasant farmers themselves. In 1875 seven farmers in Kaslunde, Funen, built and worked a dairy in common. The surplus was divided between them in proportion to the value of the milk delivered by each. Each member had one vote, and all questions were settled by a simple majority. For some reason or other this co-operative dairy, which still exists, remained unknown for years, and had no imitators. Hjedding dairy, built in 1882, in the south-west of Jutland, not far from the North Sea, is generally mentioned as the first co-operative dairy in Denmark, because it gave the impulse by which the movement spread all over the country. The main principles laid down from the first by the men who started Hjedding Co-operative Dairy were these: members bind themselves to deliver to the dairy all the milk they produce

except what they use at home ; all are jointly and severally liable ; the proceeds are divided in proportion to the amount of milk delivered by each ; all milk producers can be members without any contribution in cash. The way this dairy was started has been described as follows : during the winter 1881-82 a young man came to the inn in the village and made it known to the farmers of the district that on a certain afternoon he would demonstrate how to make the best and the most butter from milk. Many farmers met, and he then explained to them the advantages to be gained by forming a society for the purpose of engaging an experienced butter-maker who should improve the butter-making on the different farms, and get it of uniform quality, and who should then collect the butter at one place, grade it and work it together, and pack it for export. The farmers were interested, and a further meeting was convened. At this meeting the general opinion was, that it was better to collect the milk to be worked at one place, and a young dairyman, Stilling Andersen, warmly recommended this course. It was decided to form a society and to build a dairy, if farmers having between them 400 cows would come forward. At a subsequent meeting it was found that the farmers willing to join the society represented only 300 cows, but that Stilling Andersen had arranged to buy the milk from another 100 cows and to enter as a co-operator as well as to take the situation as dairyman at a modest salary. The rules were drafted on the very night after the meeting, and so ably were they drawn up that they have served as model for many other co-operative dairy societies.

✓ Hjedding Co-operative Dairy started operations on the 10th June, 1882, and at once realised a good price for its butter. This was of importance for the success of the movement. The dairy at Hjedding created a sensation, and many came to see it. The next year similar dairies were built in the neighbourhood, and in the following years many were built in all parts of the country. It was truly said, " A wave had risen from the sea in the west, nothing can stem it, it will sweep over the whole country." These co-operative dairies had this advantage over those under private ownership, that the people who delivered milk to the former were interested in the result ; therefore they

took care to deliver the milk in good condition, and to see that their neighbours did the same. As all farmers in the district joined, the van collecting the milk had to stop at every farm and house, which meant a minimum cost of cartage. There were no difficulties about the skim milk, which was returned to the farmers. The technical improvements soon brought it about that butter made in co-operative dairies from milk collected from many farms was satisfactory not only as to quantity, that is, that the same amount of butter was made from 100 lbs. of milk as in the estate dairies, but also as to quality, the "dairy butter" equalling and soon even surpassing the celebrated "estate butter."

It was the Danish peasants themselves who found a practical way of developing the dairy industry, and they found this by applying the co-operative principles introduced by the Rochdale weavers. They received no support and only lukewarm sympathy from large farmers and estate owners, until later on when the co-operative dairies were doing so well that even owners of estates with two to three hundred cows found it to their advantage to close their private dairies and to join co-operative dairies. Sympathy and support by word and pen and practical advice were given by the consulting dairy expert to the R.A.S.D., now professor, B. Bøggild.<sup>1</sup> Neither the State nor any other public body took any notice of them, nor did even such a question as the technical education of the many hundred men required to manage or work on the staff of these very complicated dairies, with their powerful and dangerous cream separators, their pasteurisers, pure culture propagators and other appliances, trouble any one outside the peasant farmer class. But from this class men came forward to supply the needs as they were felt, and foremost among these men was Niels Pedersen (1851–1911), son of a small Jutland peasant. He had passed through the usual training of practical work on the farm, winter courses at People's High Schools, agricultural school, and even a full course at the Royal Agricultural College, Copenhagen. Afterwards he purchased a small farm of 40 acres near Askov High School, opened there an agricultural school, Ladelund, and

<sup>1</sup> B. Bøggild, "Andelsmølkerier," 1887; also by same: "Mølkeribruget i Danmark," 1890, and later editions.

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built a dairy, for which he bought milk from the neighbours. This man, whose work in other branches of agricultural co-operation will be mentioned in later chapters, saw at once what the co-operative dairy system promised to develop into, and expressed his belief in the prophecy quoted earlier in this chapter. He was an indefatigable helper during the first years, before engineering firms took up this branch, by drawing up plans for buildings and for the machinery of many new co-operative dairies, and he saw the need of educating dairymen. He, therefore, in 1887, opened the first dairy school in connection with his agricultural school, and the first winter course of five months was attended by 43 dairymen. It is to a very large measure due to this man that it was possible to find technically trained managers for the hundreds of co-operative dairies which in the course of a few years sprang up all over the country. Since that time two other dairy schools have been opened, both by private initiative, all of them giving instruction, with board and lodging, at almost incredibly low fees.

“The wave from the sea in the west,” did, indeed, sweep over the country; from 1882 to 1888 new co-operative dairies were built in increasing numbers, viz., 2, 11, 26, 38, 62, 133, 217, total 489. Then the movement slackened somewhat, but did by no means stop. In 1914 an official inquiry was made by the Statistical Department of the State,<sup>1</sup> which showed that there were then altogether 1503 dairies, of which 1168 were co-operative dairies, 196 private collective dairies, and 16 estate dairies, all chiefly engaged in producing butter, while 123 dairies were chiefly engaged in the milk trade. The 1168 “co-operative dairies” are grouped according to the year they were built, as follows:—

Number of Co-operative Dairies built.							
Before 1885	...	...	...	...	...	...	84
1886-90	...	...	...	...	...	...	595
1891-95	...	...	...	...	...	...	153
1896-1900	...	...	...	...	...	...	110
1901-05	...	...	...	...	...	...	65
1906-10	...	...	...	...	...	...	92
1911-14	...	...	...	...	...	...	52

<sup>1</sup> Statistiske Meddelelser, 4 Række, 49 Bd., 1 Hæfte, “Mejeribruget i Danmark,” 1916.

The list suffers somewhat in accuracy from the fact that some dairies were started as private collective dairies, and later on changed into co-operative dairies, while giving the year of their first start instead of the year when they were made co-operative, while 17 dairies have failed to give information.

That the number of dairies has kept on increasing when it might be thought that the country had already been fully stocked is partly due to the increased production of milk, which was estimated in 1898 at 2,800,000 tons, and in 1914 at 3,500,000 tons (respectively 510 millions and 778 millions of gallons). With the increased quantity of milk it was found practicable in many places to build a new dairy and divide the district, instead of enlarging the old dairy. This was often done to reduce the average distance of farms from the dairy, whereby the cost of cartage was reduced. This plan also offered advantages to farmers living far away from the old dairy, by doing away with the necessity to have the cows milked very early in the morning, at the same time enabling the skim milk to be returned earlier in the day.

✓ The co-operative dairies gradually swallowed up nearly all the private dairies on the estates :—

NUMBER OF DAIRIES IN DENMARK.

	1900.	1909.	1914.
Co-operative Dairies ... ..	1029	1157	1168
Private collective dairies... ..	266	238	196
Estate dairies ... ..	244	90	16

An official inquiry was made in 1909<sup>1</sup> to show to what extent the dairies served the farms in the country. There were altogether 182,373 holdings in 1909 on which cows were kept. From 2568 holdings with 9828 cows no returns were received. Of the remainder of the holdings 86 per cent. were found to have joined a co-operative dairy, 7 per cent. sold milk to private collective dairies, and 7 per cent. were unconnected

<sup>1</sup> Statistiske Meddelelser, 4 Række, 36 Bind. 4 Hæfte, "Deltagelsen i Landbrugets Andelsvirksomhed 1909," published 1911.

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with any dairy, either making their own butter or more probably selling milk to the towns.

	Number of holdings.	Number of cows on these.	In percentage.	
			Hold.	Cows.
In co-operative dairies ... ..	154,602	1,059,359	86.0	83.3
In private collective dairies ...	12,536	113,834	7.0	8.9
In no dairy ... ..	12,667	98,063	7.0	7.8
	179,805	1,272,146	100.0	100.0

The question as to how the relationship to dairies varied with the size of the holding was also investigated. Grouping the holdings according to size it was found that in the different groups the following percentages of the total number of holdings in the group, and of the cows kept on the holdings, belonged to a co-operative dairy :—

Size of holdings.	Number of holdings in per cent.	Number of cows in per cent.
Less than 1½ acres ... ..	70.1	67.5
From 1 to 12 acres ... ..	84.9	86.3
„ 12 to 37 „ ... ..	88.1	88.9
„ 37 to 73 „ ... ..	90.3	90.8
„ 73 to 147 „ ... ..	88.9	88.0
„ 147 to 589 acres ... ..	82.8	73.9
More than 589 acres ... ..	49.0	38.8

This table shows how evenly the co-operative dairies have been patronised by farms of different sizes. Only the very largest farms have kept somewhat aloof from them. Seeing, however, that the number of estate dairies decreased from 90 in 1909 (the year of the above inquiry) to only 16 in 1914, it is probable that an inquiry in 1914 would have shown that a much larger percentage of the large and largest estates had joined the co-operative dairies than was the case in 1909.

Of the 3,400,000 tons of milk produced in 1909, 2,620,000 tons, or 77 per cent., were treated in co-operative dairies.

✓ The money for building a co-operative dairy is generally raised by a loan for which members are jointly liable. Most co-operative dairies have now repaid the loan, and sometimes raised a new loan. The capital required to build and equip a co-operative dairy depends on the size or the number of cows whose milk it is designed to treat, and is often stated as so much per cow. The first dairies were small and scantily equipped, and cost about 33 shillings per cow.<sup>1</sup> Now the cost is estimated :

If for 1500 cows, at	£2 2s. at £2 10s. per cow.
"   1000   "	£2 15s. at £3 0s.   "
"   500   "	£4 10s. at £5 0s.   "

In 1915 there were on an average 151 members with 931 cows in each co-operative dairy.<sup>2</sup> Grouped according to the quantity of milk treated during a year the co-operative dairies were distributed among the groups by percentages as follows :<sup>3</sup>

	In 1906.	In 1914.
Dairies treating less than 1000 tons milk...	12·7 per cent.	9·0 per cent.
"   "   1000 to 2000 tons milk ...	37·7   "	31·0   "
"   "   2000 to 3000   "   ...	32·1   "	31·4   "
"   "   3000 to 4000   "   ...	13·3   "	18·6   "
"   "   4000 to 5000   "   ...	3·5   "	7·4   "
"   "   more than 5000 tons milk	0·7   "	2·6   "
	100·0   "	100·0   "

This table shows that the average size of a "co-op. dairy" has increased during the period from 1906 to 1914.

Payment for milk delivered (that is, part payment, to which at the end of the year is added the share of the surplus corresponding to the quantity of milk delivered) is generally by quantity and quality, the price increasing with the contents of cream or fat. Originally a co-operator often had as many votes at the general meeting as he had cows; now it is almost the universal rule that one man has one vote, independently of the size of his farm. The estate owner with 300 cows has

<sup>1</sup> J. B. Krarup and S. C. A. Tuxen, "Beskrivelse af Landbrugets Udvikling i Danmark fra 1835 indtil Nutiden."

<sup>2</sup> Danmarks Mejeri-Drifts-Statistik, 19 Aargang, 1916. See also Appendix II., Table 11.

<sup>3</sup> Stat. Meddelelser, "Mejeribrug i Danmark," 1916.

just the same vote as the smallholder with one cow. The manager of the dairy generally engages and pays for the necessary help. The assistant managers are now as a rule well instructed and have attended a dairy or agricultural school.<sup>1</sup>

The quality of Danish butter has been greatly improved by the work of the co-operative dairies. Not only has the large production of indifferent or bad and always variable peasant butter completely disappeared, and has been replaced by the "dairy butter," but this has by degrees come to surpass the formerly so renowned "estate butter," both in quantity and in quality. At a large butter show in 1888 the "estates" took 15 out of 16 silver medals, and 14 out of 18 bronze medals; at a similar show in 1894 the co-operative dairies took 6 out of 7 silver medals and 14 out of 16 bronze medals. At a show in 1900, 670 exhibits out of 718 were from co-operative dairies, and they took all the silver medals and almost all the bronze medals. The objection to the peasant butter before 1882, that it came in too small quantities, and was of unreliable quality, was after 1900 applied to the estate butter. More and more of the large estates ceased, therefore, to make butter themselves and joined a co-operative dairy. The improvement attained in the quality of Danish butter has been accompanied, as will readily be seen, by an increased uniformity. The butter of no other country is sold in England at so uniform a price for all the different makes as Danish butter, and no other country's butter obtains as high prices, with the sole exception at times of a quite small amount of French fresh butter. If the average prices paid in England for butter from the various countries be compared, the price realised by Danish butter will be found to be considerably above that realised by the butter from any other country, owing to its uniformly high quality. And this result is decidedly due to the co-operative dairies.

The higher prices realised for the butter meant higher prices paid to the farmers for their milk, and that, thanks to the co-operative dairies, meant the same price to the smallholder with his one gallon as to the large farmer with his several hundred gallons; that meant such an improvement in the percentage of profit on the smallholder's milk production, that he soon saw his way to increase the number of his cows, and to

feed them better. And as he received the skim milk and butter-milk back from the dairy, he was able to feed one or more pigs, which he could deliver to the co-operative slaughter-house. From cows and pigs he obtained an increased amount of manure which resulted in an increased yield of his crops—altogether a great progress in the cultivation of the small-holdings. As the small-holdings cover more than one-tenth of the cultivated area, it is evident that this increased agricultural production is of considerable benefit to the country.

Similarly with the peasants. There are more than 70,000 farms in their possession, nearly all freehold, occupying over 70 per cent. of the cultivated area. Of these yeomen farmers nearly 90 per cent. are members of a co-operative dairy society. In former times, that is before 1882, an average peasant farm of about 70 acres would keep normally 8 cows. The yield of these was hardly above 380 gallons of milk or 110 lbs. of butter. For this the farmer would get about 5*d.* per lb. below the price of "estate butter." The co-operative dairies changed all this. The number of cows was increased, and their quality improved. Eleven cows would be the average number on a farm of 70 acres; their milk yield was increased to 550 gallons with 200 lbs. of butter. The quantity of butter produced per farm increased from 880 lbs. to 2200 lbs., and each pound realised full market price instead of 5*d.* below.

✓ The number of cows in Denmark was in 1881 899,000, and in 1914 1,310,000.<sup>1</sup> The yield of milk per cow and the percentage of fat in the milk were increased,<sup>2</sup> and the fat was more completely utilised for butter-making. At the same time the increased consumption of margarine set a corresponding quantity of butter free for export. From all this has resulted a rapidly increased export of butter from Denmark.

EXPORT OF DANISH BUTTER, Yearly Averages.

					Tons.	£
1881-85	...	...	...	...	15,630	1,620,000
1901-05	...	...	...	...	75,627	8,000,000
1911-15	...	...	...	...	90,265	10,950,000
1925-29	...	...	...	...	141,058	26,810,000

An industry of that magnitude, made possible only by co-operation, has, of necessity, had a far-reaching effect on

<sup>1</sup> See Appendix II., Table 10.

<sup>2</sup> *Ibid.*, Table 11.

<sup>3</sup> *Ibid.*, Table 13.

trade and industry in many directions. The building and allied trades have found occupation in building, extending, and rebuilding both dairies and farm buildings for the increased stock, and engineering and machine trades in manufacturing separators, pasteurisers, coolers, churns, milk cans, balances, etc.; a large demand for beech wood for staves for butter casks has benefited owners of beech forests and the timber and coopering trades, and so forth. The large import of feeding stuffs for the increased stock, of salt, soda and oil for the dairies, and the large export of butter have benefited not only merchants but also the shipping trade.

Compared with all these advantages there have been very few drawbacks. During the first years, no doubt, many farmers forced the milk production beyond what was economical, and spent more on feeding stuffs than the cows could return in milk. There has been, and to some extent there still is, some difficulty for the people, living in the country and not keeping cows, to get milk, particularly whole milk, as this is almost totally absorbed by the co-operative dairies. This has affected the poor people and the labourers, who in former times often received milk as a gift in addition to their wages.

But the principal objection to the co-operative dairy system was the mixing of milk from many herds, not because of its effect on the butter, but because of the return to the farmers, as food for their calves and pigs, of mixed milk derived from many herds of which some in all probability contained cows giving tuberculous milk. This system, unavoidable if co-operative dairies were to remain, contained undoubtedly a grave danger, but this has been happily obviated, thanks in the first instance to the exertions of the great veterinary authority, Dr. B. Bang, to whose distinguished research work and untiring energy in combating tuberculosis we owe so much of our present knowledge of that disease. It is doubtful, however, if even he would have been able to effect the required reform, were it not for a most fortunate concurrence of developments seemingly with no interconnection.<sup>1</sup>

In a remarkably short time a new system of treating cream

<sup>1</sup> Harald Faber, "Compulsory Pasteurisation of Milk in Danish Dairies as a Precaution against Tuberculosis," Public Health, January, 1901.

in dairies had been adopted in Denmark from whence it has spread to many other countries, even as far as Australia. The origin of this treatment of cream, viz., pasteurisation and the use of a more or less pure culture of bacteria to start the fermentation necessary for the development of the butter flavour, can be traced to a serious complaint of the quality of the butter made at Duelund estate, the property of a former Danish Minister of Agriculture. Careful inspection showed that the animals were healthy ; there was no lack of technical skill in the manipulations in the dairy ; and still the butter was very unpalatable. As no means availed to overcome this difficulty, on an estate previously renowned for its fine butter, and as the trouble spread to neighbouring dairies, N. J. Fjord, the eminent leader of the Laboratory for Agricultural Research at Copenhagen, was appealed to for help. A bacteriological laboratory was fitted up on the estate, and it was proved that the milk was pure when milked with proper aseptic precautions ; that a certain microbe present in the dairy, the cowsheds and one of the wells on the farm, was the cause of the disagreeable taste and flavour of the butter ; that this microbe was destroyed by heating the milk or the cream to 71° C. (160° F.) ; that cream so heated did not retain a boiled taste when quickly cooled down ; and finally, that excellent butter could be made from the cream when the obnoxious microbes had been killed by heating, the cream subsequently cooled and a fermentation-starter added, in the form of either buttermilk from a dairy producing fine butter or a " pure culture."

The absolute success of this attempt to trace and to check the cause of a disease in the milk, producing a bad flavour in the butter, led to the application of the same method of pasteurisation in other dairies, and it was found that it invariably resulted in an improved quality of the butter. The pasteurisation of cream, in connection with the use of " pure cultures " for starting the fermentation, for the purpose of improving the quality of the butter, was gradually adopted in other estate and co-operative dairies, and it was found at the periodical butter shows that an increasing proportion of the prizes was awarded to those dairies who had made their butter by this new process. The report of the original scientific researches was published in

1891. The proportion of estate and co-operative dairies which had introduced the method was :—

For the year 1892	...	...	...	...	11 per cent.
" " 1893	...	...	...	...	23 "
" " 1894	...	...	...	...	44 "
" " 1895	...	...	...	...	86 "
" " 1896	...	...	...	...	93 "
" " 1897	...	...	...	...	97·5 "

In other words, in the course of six years this new method had been almost universally adopted by Danish dairymen. Not only that, but it was found that the butter from the dairies which did not pasteurise their cream was very much inferior in quality to that from other dairies, a result which corresponded to the awards given at the butter shows held by agricultural societies.

The temperature at first recommended for pasteurising cream was 71° C. (160° F.). Practical experience in the dairies has gradually led to the use of higher and higher temperatures. In connection with a series of local butter shows at which about 170 dairies exhibited their butter every year, the managers gave information as to the temperature to which each of them had heated the cream. The average of these temperatures shows a yearly increase, viz. :—

For 1894 the average was	74° C. (165° F.).
" 1896 " " "	78° C. (173° F.).
" 1897 " " "	78° C. (173° F.).
" 1898 " " "	80° C. (177° F.).
" 1899 " " "	83° C. (181° F.).
" 1900 " " "	87° C. (188° F.).

And it was found every year that the average temperature for the prize butters was higher than the average for all the butters of that year.

Quite voluntarily and solely for the purpose of improving the quality of the butter a new practice had been introduced in almost every Danish dairy, involving heating the cream to at least 82° C. (180° F.), for the purpose of destroying the microbes present, of which some would otherwise have exercised an injurious effect on the flavour of the butter. Skim milk was generally heated to even higher temperatures, 88° C. (190° F.) to 90° C. (195° F.), in order to make it keep sweet.

Having explained this dairy-technical development, we will now return to a consideration of the principal objection to the co-operative dairy system, viz. the danger of spreading tuberculous milk, milk containing the microbes or bacilli of tuberculosis, to calves and pigs on other farms, and so infecting these with the disease. As a result of the works of Dr. Bang and other investigators, it was well known that tuberculous milk could, and probably would, infect calves and pigs when mixed and spread as it was by passing through co-operative dairies. And this would be so in all civilised countries, as all have their proportion of tuberculous cattle. It was likewise well known that if milk is heated momentarily to 85° C. (185° F.), all tubercle bacilli contained therein will be killed. When cream has been heated to a temperature of 85° (185° F.), then the butter made from it as well as the buttermilk are free of all danger of infection. It would, therefore, be a sufficient protection of the stock against infection through the milk, if all milk returned from dairies had been previously so heated. And as almost all Danish dairies had already voluntarily introduced heating both skim milk and cream, it would evidently be no hardship to require that all dairies should so heat their milk and cream. A Law was therefore passed in 1898, which was amended in 1904, and revised in 1912, according to which it is prohibited to deliver from dairies, as food for cattle, milk and buttermilk which have not been previously heated to a temperature which was in the first Law fixed at 85° C. (185° F.), but has in the later Law been reduced to 80° (176° F.), for the practical reason, that easily applied tests will show whether milk has been heated to at least 80° C. (176° F.), but will not show that it has been heated above that temperature. A thorough heating to 80° C. (176° F.) when this temperature is maintained for some time is quite sufficient, and is as effective as a momentary heating to 85° C. (185° F.). The law further provides that all cream from which butter is churned for export must be heated to that temperature. By this measure the danger involved in the co-operative dairy system has been effectively met.

The *Co-operative Dairy Societies* (sometimes named for short "co-op. dairies") have combined in *Dairy Associations* for

the better protection of their common interests. Of these Dairy Associations there are now 21 in different districts, and they comprise 1203 of the Co-operative Dairy Societies. These Dairy Associations again formed three provincial *Unions of Dairy Associations*, which from 1899 co-operated through a kind of general purpose committee consisting of the three chairmen. This committee among other works started an Insurance Society and a Joint Purchasing Society for Co-operative Dairy Societies (to be mentioned later on) and built the first Co-operative Sanatorium for patients suffering from tuberculosis. In 1912 this committee was re-organised and became the *Central Organisation of Danish Dairy Associations*, consisting of seven members, viz. the chairmen of the three Unions of Dairy Associations and four members elected for two years at the annual meeting of delegates. Each local Dairy Association elects one delegate for each 20 members, *i.e.* Co-operative Dairy Societies, to attend the General Meeting of Delegates, which is the highest authority of the Central Organisation; the annual meeting elects the chairman for one year at a time.

This Central Organisation represents the Danish Co-operative Dairies in their internal and external relations; it deals with any question relating to the dairy industry which may be raised by the legislative or administrative authorities, such as Bills before the Rigsdag; it has its statistical office which collects information concerning the management of the co-operative dairies, and the prices paid to them for their butter; it fixes a weekly butter quotation through a committee elected at the annual meeting, and so forth. The Central Organisation has appointed a consulting expert to advise dairies on the economical use of fuel whereby a considerable economy has been effected, and another expert to advise them on dairying generally. A Committee for Dairy Statistics, to which the Central Organisation elects three members and the Danish Dairy Managers' Society two members, publish annually the "Danmarks Mejeri-Drifts-Statistik" or "Danish Statistical Report on Dairy Management," containing tables and charts giving detailed information for each of the dairies sending in their accounts (in 1916 reports came in from 742 dairies) showing: the number of members,

the number of cows, the amount of milk received, the amount of butter produced, skim milk and buttermilk returned to farmers, skim milk and buttermilk used for cheese making, the outgoings for wages, cartage, fuel, packing, oil, salt, etc., proceeds from sale of butter, etc., surplus paid to members, net proceeds per 2 kilo milk, etc., etc. ; and also general averages for all the dairies showing yield per cow, production, prices, economical result, etc.<sup>1</sup> The same Committee for Dairy Statistics also publish an annual report on the prices paid week by week to dairies for their butter. The statistical office, to which the State make a grant (on the current budget : £560), has at various times published lists of all dairies in Denmark, both co-operative dairies, collective private dairies, and estate dairies ; comparisons between economical working of large and small dairies ; information on the various ways of paying for milk received ; different systems of cooling in use in dairies, and so forth. The first chairman of the Central Organisation was Anders Nielsen, Sveistrup Östergaard, who in 1914 was succeeded by Niels Porse.

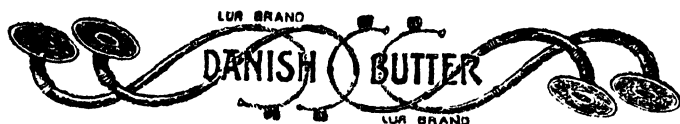
Some of the local Dairy Associations have supported a movement for the formation of Societies for Milk-testing, introduced in 1902. There are now 14 such societies with 291 co-operative dairies as members. A milk-testing society appoints a " milk judge," whose duty it is to visit the dairies comprised in the society in irregular rotation, and, jointly with the manager of the dairy visited, to taste and to test the milk from each co-operator as it arrives at the dairy. The result of each judging is sent to the members of the co-operative dairy society, and these are instructed in the proper treatment of the milk. The idea is to ensure a supply of fresh and clean milk to the dairy. In some societies deductions in the price of milk are made in case of unsatisfactory milk ; in others a small money premium is paid to the co-operators whose milk has come out best as the result of the year's testing, which premium is generally given to the person responsible for the milking and care of the milk.

One form of co-operation between Danish Dairy Societies for a very special purpose deserves to be mentioned, although

<sup>1</sup> Some extracts are given in Appendix II., Table 11.

it is no longer in existence, both because it has led to an important legislative enactment still in force, and because it gives a remarkable instance of how completely and how quickly Danish farmers will join in a voluntary movement for an object which they thoroughly approve of. For some years a general feeling had been prevalent among farmers that a common mark to distinguish Danish butter from butter from other countries, would be a great advantage for the sale of their butter in the English markets, and there was a desire that the State should establish some kind of a "national" mark. Six members brought in a Bill to that effect in 1891, but the Government opposed it, as they thought the description "Danish Produce" offered all the protection required, and all that a special mark could secure. A committee appointed in 1896 by the Royal Agricultural Society of Denmark failed to agree on any proposal, some members representing the view of the peasant farmers in favour of a national mark, others supporting the view of the Government against it. Another committee was appointed by the R.A.S. which in 1899 published a report giving a resume of the development in the butter trade which had led to the wish for a national mark, and the legal definition of a trade mark. It also pointed out how a trade mark could be used jointly by a number of dairies, either by the latter forming a trading society, or by an arrangement, sanctioned officially by practice in Denmark, by which a trade mark registered by the owner of one dairy can be used by other dairies with the consent of the registering owner, who remains under an obligation to prevent the use of the mark by others than those to whom he had given the right to use the mark. As soon as this report was understood by the farmers it was acted upon; the Unions of Dairy Associations appointed a committee, and in 1900 the Danish Dairies Butter Mark Society (Danske Mejeriers Smørmerkeforening) was formed for the purpose of having all Danish butter marked with a common trade mark, the members being Danish dairies, either co-operative, private collective, or estate dairies. So quickly did all Danish dairies join this society that in 1906 of the then total number, viz. 1328, all but 13 had joined, and it is doubtful whether any single Danish dairy making butter for export had failed to join. The chairman

of the society was Anders Nielsen, Svejstrup Östergaard. The trade mark of the society, viz. :—



was registered in Denmark and in England, and in 1905 also in Germany, where Danish butter was in increasing demand. The mark was stamped ("hot-pressed") along the whole length of two opposite staves in the butter cask before the staves were fitted in the cask : from 1906 the mark was also printed on a piece of thin paper to be laid on the top of the butter inside the cask.

The zeal of this society and its energetic chairman brought it about that all Danish butter exported from Denmark was voluntarily marked with the "Lur Brand." Lur is the old Danish name for a war trumpet as used by warriors in the Bronze Age. The lurs were always sounded in pairs. The mark consists of two pairs of lurs and the words "Lur Brand" and "Danish Butter." Having accomplished the chief aim, and gradually secured the support of the Danish exporters, and having from the first met with decided approval from the provision trade in Great Britain, the C.W.S. being among the first to require that all the butter they bought in Denmark should bear the new brand, the Danish farmers, as represented by the Associated Danish Agricultural Societies, the Union of Dairy Associations, the Butter Mark Society, and the Dairy Managers' Society, approached the Minister of Agriculture in December, 1903, with a request that the Butter Mark, which was already then in use on nearly all Danish butter exported, might be made compulsory by Law. The following year a Bill was prepared and on the 30th March, 1906, a Law received the Royal sanction, under which by a Royal Decree of 30th August, 1906, the "Lur Brand" became a compulsory mark for all butter produced in Denmark from pasteurised cream and intended for export. Under the same Royal Decree a very similar mark was ordered for use on all Danish bacon exported from Denmark. The mark for bacon was registered

in England in 1909, under sect. 62 of the Trade Marks Act, 1905, in the name of the Danish Board of Agriculture, and the mark for butter was similarly registered in 1912. The Law of 1906 has since been superseded by a Law of 12th April, 1911, "On the Trade in Butter and Foreign Agricultural Produce." The provisions dealing with the mark for butter are contained in sects. 4 and 6, according to which—

Sect. 4.—"Danish butter shall not be exported from this country unless it is made in a dairy, which has been accepted for control (see sect. 9), from cream or milk which has been pasteurised (heated to at least 80° C. [176° F.]), and at the place of manufacture has been marked with the marking prescribed in Sect. 6. . . ."

Sect. 6.—"A common mark applicable to the whole country shall be prescribed by Royal Decree, and it shall be applied at the place of manufacture . . . to all butter containing no more than 16 per cent. of water, made at dairies accepted for control, from cream or milk which has been pasteurised (heated to 80° C.). This mark shall be known as the 'Lur-Brand.'

"The common mark shall be applied both to the packing and to paper labels which shall be placed on the butter itself, etc. . . ."

The Butter Mark Society having accomplished all it was intended to do and even much more than anybody had expected it to do, ceased to exist, and in March, 1915, its name was removed from the list of Danish trading firms. A common mark with a similar object to that of the Danish Butter Mark has since been adopted in Sweden, Finland, and Ireland.

The co-operation of Co-operative Dairy Societies for other purposes, such as the sale of butter or the purchase of various requirements, is dealt with in subsequent chapters.

From the DAIRY PRODUCE STATISTICS for 1929.

Number of Co-operative Dairy Societies	1,362
Co-operators average per Dairy	148
Number of Cows per Dairy	1,072
Quantity of Milk per Dairy	4,125 metric tons.
Working Expenses per ton of Milk	14s. 2d.
Lbs. of Milk per lb. of Butter	23.6

## CO-OPERATIVE SLAUGHTER-HOUSES

### BACON FACTORIES

ONLY five years had passed since the building of the first co-operative dairy in 1882 when the co-operative movement took a new step forward, which proved to be the beginning of a very important development. The first co-operative bacon factory was opened in 1887.

Pig breeding was not a very important branch of Danish agriculture during the first half of the nineteenth century. In June, 1837, the total pig population numbered only 235,000 animals, and their quality was very indifferent. When dairy farming became general the skim milk, buttermilk, and whey from the dairies enabled farmers to keep more pigs, and the number of these increased. From 1837 to 1881, *i.e.* in the course of 44 years, the number of pigs rose from 235,000 to 527,000; and during the following 7 years there was a further and very much more rapid increase of 249,000 to 771,000.<sup>1</sup> That was the period of the beginning of the co-operative dairies, and with their development came further increases in the number of pigs. In the fifties the export from Denmark, exclusive of the Duchies, amounted to a few thousand pigs only, and less than 1000 tons of pork. In 1883 the export was 374,500 live pigs and 10,000 tons of pork and bacon. Simultaneously with the increase in number there was an improvement in the quality of the pigs brought about by the introduction of pigs of the Berkshire and the Middle Yorkshire breeds. At several places herds of these English breeds were kept pure from which boars were sold all over the country, so that the stock of pigs in the seventies was quite good, of a quality corresponding to the condition under which they

<sup>1</sup> See App. II., Table 10.

were reared and equal to the demands of the German market, to which nearly all the pigs which were exported alive were despatched.

There was some export of salt pork from Denmark in the early part of the nineteenth century by C. J. Hambro, who afterwards settled in London and founded the well-known banking firm there. His business was continued by A. N. Hansen and Co. In 1866 Philip W. Heyman, in Copenhagen, and in 1879 Magnus Kjær, in Holstebro, built bacon factories, and several other factories were started during the following years, and they all had the English market as their chief outlet. In 1887 the export of pork, bacon, and hams amounted to 25,000 tons, of which 20,000 tons went to England. The Danish farmer had, therefore, to supply three different markets, which had different requirements. The Germans required a heavy, very fat pig, the English a long, lean pig of much smaller weight, the home demand being for a pig of medium size and fatness. With the increased production in Hamburg of bacon for the English markets an increasing number of lean pigs was bought in Denmark by Hamburg curers to be sold in London as Hambro' bacon. The bacon factories in Denmark and Hamburg complained that many Danish pigs were too short and too fat for bacon production. To improve the breed for that purpose the large white Yorkshire pig was used, and Magnus Kjær in particular bought many boars of that breed from England, and had them stationed at various places from whence pigs were sent to his factory. Before long his bacon acquired a high reputation in London, and many boars, bred from his English pigs, were sold to other districts in Denmark. But there was a considerable uncertainty in the breeding business, because sometimes the bacon pigs and sometimes the heavy fat pigs for the German market paid best. The German commercial policy came to the aid of Danish farmers, and brought about the desired unity in the breeding of pigs and also conferred other advantages.

Until the year 1879 Germany had admitted live pigs free, but in that year an import duty of 2 marks per pig was imposed, which in 1885 was increased to 6 marks. In November, 1887, the import of live pigs from Denmark into Germany

was prohibited altogether, on the ground that swine fever (hog cholera) had appeared among pigs in the Copenhagen district. This caused a heavy fall in the price of fat pigs, which all through the winter were sold at about  $2\frac{1}{2}d.$  per lb. live weight. The Royal Agricultural Society of Denmark resolutely took steps to promote an export of live pigs to England, 16,000 being shipped in 1888, and 21,000 the following year; but that attempt achieved no permanent result. In 1890 Germany opened her frontiers again to the import of pigs, and fat pigs were again produced, chiefly on the islands, for export to Germany. In October, 1895, Germany made an attempt to hinder this trade by ordering a quarantine for pigs on importation. When a few Danish pigs were found in Rostock suffering from a lung disease, Germany, in December, 1895, prohibited all import of live pigs, fresh pork, and fresh offal of pigs from Denmark. The result of this policy was that almost the whole of the Danish pig products was despatched to the United Kingdom, and this again resulted in a strong determination on the part of the pig breeders, who henceforth devoted their entire energy towards the production of the best possible bacon pig. From this again resulted a great improvement in the quality of the bacon. This development was greatly furthered by the establishment of the many Co-operative Bacon Factories which had been built after 1887.

It is sometimes stated that the commercial policy of Germany gave the initiative to the laying out of the first co-operative bacon factory in Horsens. This is not, strictly speaking, the case, as the decision to build the factory had been arrived at before the German prohibition of 29th November, 1887. Leading men in the Horsens district, seeing the beneficial results of co-operation in other branches of agricultural industry, had for some time deliberated whether certain vexatious conditions affecting the sale of pigs in their district could not be removed by means of co-operation. The German prohibition and the serious fall in the prices of pigs gave a stimulus to their work, and ensured its successful accomplishment. The leading spirit in this work was Peter Bojsen, owner and principal of Gedved "People's High School," and chairman of the Agricultural Society of Horsens. There was no bacon factory

in or near Horsens ; the pigs were bought by dealers, weighed at the railway station, and sent by rail. In some years as many as 20,000 pigs have been weighed. Farmers had to wait a long time at the station, had to pay 4*d.* per pig for the weighing, and to "tip" right and left to get attention. The Agricultural Society applied to the railway for an alteration in this arrangement, only to meet with a refusal. A sub-committee was appointed ; acting on the suggestion contained in their report the committee of the Agricultural Society decided in May to recommend the building of a large Co-operative Bacon Factory at Horsens, and on the 27th of May circularised farmers in the district. A slaughter-house or bacon factory on co-operative lines would, in the opinion of the committee, offer three advantages : (1) the commission paid by existing slaughter-houses to the dealers who bought pigs in Horsens district would be saved ; it amounted to about £1700 annually ; (2) the difficulty experienced by existing slaughter-houses in disposing of the offal would be greatly reduced when the co-operators became interested in its utilisation ; (3) the co-operators would share between them all the profit which now went to shareholders, and the farmers would receive all that could be realised from the pigs delivered. The farmers of the 53 parishes, forming the district of the Agricultural Society, would have to guarantee the necessary number of pigs of the right size and quality ; a sum of about £6700 would have to be raised, which it was suggested could be done by a loan from a bank if the co-operators in each parish would become jointly liable for a certain share in the loan. By the 1st July a sum of £9400 had already been guaranteed by 1100 co-operators, while 1200 had undertaken to deliver 10,500 pigs annually for a period of seven years. The factory was therefore secured ; P. Bojsen was elected chairman, and in August building operations began.

This co-operative undertaking, contrary to the first co-operative dairy, met with considerable opposition from several quarters. Owners of private bacon factories and dealers who used to buy pigs in the district were naturally against it. The papers published letters from Hamburg to prove to farmers that the production of bacon pigs did not pay. Local banks

refused to advance the necessary capital, which was, however, obtained from a savings bank in another town. The Town Council of Horsens did not desire "to be encumbered" with a slaughter-house, and the Sanitary Committee declared that it might be injurious to the public health, and prohibited the building of the slaughter-house on the site where it was already in process of erection. Against this decision of the Sanitary Committee of the town the directors of the slaughter-house appealed, on the ground that the site was outside the boundary of the town, and they gained the day. The Town Council then required that the chairman of the bacon factory should take out a licence both as a slaughterer and as a merchant; and as he refused, all the members of the managing committee were fined individually for trading without a licence, and the double licence had to be taken. All this opposition on the part of the town is characteristic of the feeling of the urban population at that time towards the co-operative efforts of the rural population. Some years later, when experience had shown how great were the advantages which a co-operative bacon factory brought to a town by the activity and trade it created and the custom it brought to the dealers in the town, the various towns vied with one another to become the domicile of a new factory.

On the 22nd December, 1887, the first killing was done in the first Co-operative Bacon Factory, and during the first year 23,000 pigs were killed, a larger number than was expected. The pigs were not all supplied by co-operators; some were bought from other farmers. This good result was obtained notwithstanding a keen competition from the private curers, who raised the price of pigs to prevent the co-operative factory from buying. This competition was maintained during the following years, with the result that, although about the same number of pigs were killed, the economical result was less satisfactory. There was even, at the annual general meeting in 1890, a considerable agitation for the sale of the factory; but the storm blew over, only to be followed soon after by a greater danger in the form of an attempt to amalgamate Horsens and other co-operative slaughter-houses with the private slaughter-houses, as will be mentioned below.

In order to improve the breed of pigs and give them a better shape for bacon production, the Horsens Co-operative Factory bought during its first year about 200 breeding boars and sows from Holstebro, where the breed had been improved by the use of large Yorkshire. Later on several pure Yorkshire boars were bought in England and stationed round about in the district.

Owing to the very largely reduced export of live pigs to Germany, and the good demand in England for Danish bacon, the interest in co-operative bacon factories spread, and many meetings were held throughout the country during the following years, at many of which P. Bojsen was an eloquent advocate for building more co-operative factories. Many farmers, especially among the larger landowners, hesitated or spoke and voted against them. They considered it too risky to bind themselves to deliver their pigs to a co-operative factory and to guarantee such large sums for building and working capital; while others argued against the one-sided development of pig-breeding in the direction of bacon pigs for the English market, and wanted the breeding of heavy fat pigs for the German market kept up so as to be prepared when Germany should again admit the Danish pigs. It was only natural that private curers should try to persuade the farmers that co-operative factories increased the working expenses and brought less money to the country and that the co-operative factories turned out an inferior article, as, indeed, might well have been the case during the initial stage.

But among the smaller farmers, the peasants, there was a considerable eagerness for the co-operative factories: they formed committees, sometimes supported by townspeople, who began to see the advantage to the town of drawing the peasants there and of having a considerable industry established in the town. The result was that in 1888 four co-operative factories were built, of which two, like Horsens, were in Jutland, while one was in Funen and one in Sealand. In 1889 four more, and in 1890 three more were formed, and so on. By the end of the year 1897, or ten years after the first co-operative factory had been built, 24 co-operative factories had been erected, of which 8 were in Jutland, and 16 on the islands,

These numerous factories had naturally considerable difficulties to contend with at first. It was difficult or impossible to find enough men who understood the technical management of a factory, and at the same time had sufficient mercantile experience. Experience was also lacking as to the best method of building a bacon factory; many of the first roofs, being built of wood, were perished by the constant condensation of moisture, so that they had to be replaced in other and more expensive materials; some of the factories were too small or did not receive enough pigs, whereby the working expenses per pig became too high. During the first years these co-operative factories had, therefore, to buy their experience, and sometimes pretty dearly, and the annual general meetings were often stormy and brought proposals for winding up. Only two factories, however, closed down. The large factories showed very fair results, and when during the nineties prices in the bacon market improved and more pigs were sent to the factories, all opposition from within co-operative circles ceased, and all agreed that the co-operative factories had improved the production, and secured the farmers a higher return for their pigs. The competition between co-operative and private slaughter-houses was very keen during these years. In 1890 there were of the latter kind 14, besides 3 joint-stock factories. Four private slaughter-houses had to close down during 1890; they suffered in the competition because, unlike the co-operative factories, they could not rely on a steady supply of pigs, while co-operators were under an obligation to send to the co-operative factories all the pigs they bred. Since 1890 there has been a certain amount of joint action between the co-operative factories, for such purposes as the collection of statistics of prices obtained in England, the quotation of prices for pigs, the joint purchase of salt, saltpetre, etc.

The most important of the private curers was Philip W. Heyman, a merchant in a very large way of business, who owned several bacon factories in Denmark and South Sweden. In 1890 he elaborated an extensive plan for the amalgamation of all bacon factories and all pig breeders into one large joint-stock company, to be called "The Danish Bacon Factories." All factories were to be transferred to the new company at

cost price; pig breeders were to be represented on the committee, and to have a right to hold shares; shares were to receive interest at 5 per cent.; certain sums were to be set aside for a sinking fund, and the remaining surplus should be divided equally between shareholders and suppliers of pigs, with this proviso, that shareholders were never to receive of this surplus more than  $1\frac{1}{2}$  kr. (1s. 8d.) per pig, the remainder, if any, to be divided between the breeders in proportion to the number of pigs supplied by each. This proposal was discussed at a meeting held in the Copenhagen Exchange, in July, 1890, C. F. Tietgen in the chair. But, although favoured by some of the representatives of the farmers, it was strongly criticised by others, and was on the point of being rejected, when Tietgen, by way of compromise, made a provisional proposal whereby the prices of pigs all over the country should be regulated every week by a joint committee, all pig breeders being entitled to participate in the annual surplus according to rules to be fixed independently by each slaughter-house. The committee, elected by representatives, one for each slaughter-house, was to consist of one representative for the private and one for the co-operative factories, while a third member could be elected, for instance, by the Agricultural Societies; this committee could also, if desired, control the export and sale of bacon, regulate killings according to the state of the market, and so forth. This proposal was accepted. A committee of eleven was formed to give it further consideration, and a sub-committee of three was elected, consisting of Bojsen, Heyman, and a leading landowner, Tutein. But Bojsen raised the objection that the private slaughter-houses were valued at a figure far beyond their real value, a point of some importance, as their influence in the management of the company was in proportion to the amount of valuation; other points of dissent cropped up, and when the committee of eleven met, the proposal was rejected by the representatives of the private factories. The following year a new basis for an agreement was proposed by a committee, and several factories, both private and co-operative, supported while others opposed it, and a further opposition came from the side of the "free" breeders of pigs, those who were tied to no particular slaughter-

house, and who feared that, by the slaughter-houses forming a kind of trust, their interests might be sacrificed. For the second time the plan was rejected. A third attempt was made in 1896, because of the low prices for pigs then ruling, but again it came to nothing.

Although undoubtedly the proposed amalgamation of the co-operative and the private factories into one large concern would have lessened the strong competition and brought the factories many advantages, it was a great blessing that it did not come about. It would have meant nothing short of the sacrifice of all the advantages which co-operative action was to bring the farmers. The keener the competition from the side of the private curers, the stronger the necessity of keeping the co-operative factories as near to perfection as possible. If the co-operative principle had been betrayed in the important agricultural industry of bacon curing it would have affected the development of co-operation also in other directions. Time has shown that the co-operative bacon factories are more than able to hold their own, and with the increased stock of pigs, due to the development of the dairy industry as well as of the bacon industry, the number of co-operative factories has increased. From 1903 onwards, some have been added every year; sometimes as many as three or four new factories have been established in one year. The total number in 1916 was 45, while the number of private factories was 17. The number of pigs in Denmark is given officially as follows: <sup>1</sup>

1837	...	...	...	...	...	...	...	...	235,000
1871	...	...	...	...	...	...	...	...	442,421
1881	...	...	...	...	...	...	...	...	527,417
1888	...	...	...	...	...	...	...	...	770,785
1898	...	...	...	...	...	...	...	...	1,168,493
1909	...	...	...	...	...	...	...	...	1,467,822
1914	...	...	...	...	...	...	...	...	2,496,706

Fairly full official statistical information about the agricultural holdings connected with co-operative slaughter-houses is available for the years 1903 and 1909. In 1903 <sup>2</sup> there were 196,800 holdings on which pigs were kept. Of these 63,359

<sup>1</sup> See App. II., Table 10.

<sup>2</sup> Statist. Meddelelser, 4 Række, 22 Bd. 5 Hæfte, "Landbrugets Andelsvirksomhed," 1906.

## 64 CO-OPERATION IN DANISH AGRICULTURE

were connected with a co-operative factory, representing 723,357 pigs. But as 23,211 owners with 83,000 pigs had omitted to send returns, the number of co-operators must have been larger than the 63,000. In other words, probably quite one-third of all holdings with pigs were in connection with co-operative factories. If the co-operators be grouped according to the size of their holdings, the following table will show, by percentages, how co-operators are distributed among the different groups.

Size of holdings.	Percentage of co-operators in the groups.	Number of holdings in the group as percentage of total number of holdings in the country.
Less than 1½ acre ... ..	1·1 per cent.	22·2 per cent.
From 1½ to 12 acres ... ..	23·2 "	27·4 "
"  12 " 37 " ... ..	26·0 "	20·3 "
"  37 " 73 " ... ..	25·6 "	15·5 "
"  73 " 147 " ... ..	19·2 "	11·0 "
"  147 " 589 " ... ..	4·6 "	3·3 "
More than 589 " ... ..	0·3 "	0·3 "
	100·0 per cent.	100·0 per cent.

It is a very striking fact that the peasant proprietors were the backbone of this form of co-operation with a good support from the larger of the smallholders. Although holdings between 37 and 147 acres formed barely 27 per cent. of all the holdings in the country, their owners formed 45 per cent. of all the co-operators.

In 1909<sup>1</sup> a total number of 1,467,822 pigs were kept on 188,335 holdings, of which, however, 6583 holdings with 17,695 pigs failed to send returns.

	Number of holdings.	Number of pigs.	Percentage of	
			Holdings.	Pigs.
In a Co-op. slaughter-house ...	86,510	926,886	47·6	63·9
Not in a Co-op. slaughter-house...	95,242	523,241	52·4	36·1
	181,752	1,450,127	100·0	100·0

<sup>1</sup> Statist. Meddelelser, 4 Række, 36 Bd. 4 Hæfte, "Deltagelsen i Landbrugets Andelsvirksomhed," 1911.

Somewhat less than half the number of holdings, representing, however, close upon two-thirds of the number of pigs, were attached to the co-operative factories.

From the year 1914 the official information <sup>1</sup> available is to the effect that the number of holdings with pigs increased to 208,000, of which 111,000, or about 53 per cent., were attached to co-operative factories. In the co-operative paper, *Andelsblad*, it is stated that the number of co-operators in 1915 increased to about 141,300, or close upon 70 per cent. of the number of owners of pigs.

The inquiry in 1909 also showed, for each group of holdings arranged according to size, what percentage of the total number of holdings in each group was attached to a co-operative factory, and the percentage of pigs, out of the total number of pigs kept on holdings of the group, so attached.

Size of holdings.	Number of holdings in per cent.	Number of pigs in per cent.
Less than 1½ acre ... ..	6·6	12·8
From 1½ to 12 acres ... ..	39·3	48·4
"  12  "  37  "  ... ..	52·6	61·2
"  37  "  73  "  ... ..	62·2	71·2
"  73  "  147  "  ... ..	64·9	73·6
"  147  "  589  "  ... ..	56·7	63·4
More than 589  "  ... ..	38·3	45·4

If this table is compared with the corresponding one showing the participation in the co-operative dairies (p. 42), it appears that of the very small holdings fewer took part in co-operative bacon factories than in co-operative dairies, which is to some extent explained by the fact that the number of pigs on these very small holdings of less than 1½ acre is so small that there is seldom more than sufficient for the owner's own use. As already mentioned it is the holdings of between 37 and 147 acres that form the main support of the co-operative bacon factories. There is a very marked difference between the tables for slaughter-houses and for dairies in this respect, that the percentages of "co-operative" cows in a group were seldom larger, but often smaller than the percentages of "co-operative"

<sup>1</sup> Statist. Efterretninger, 1915. No. 10.

holdings, and were considerably smaller in the two last groups containing the large holdings; while the percentage of "co-operative" pigs was in every group considerably larger than the corresponding percentage of "co-operative" holdings, and most so for the smallest and the largest holdings. This means, that of the breeders of pigs those who had large herds of pigs were in all groups the staunchest supporters of co-operative slaughter-houses, while with regard to co-operative dairies the co-operators' herds were of average size for the group, or even smaller than the average as regards the groups of the smallest and largest holdings.

The co-operative slaughter-houses gradually increased in number, and at the same time in size, while the private slaughter-houses lost ground. The average killing per slaughter-house per year increased, in the case of the co-operative slaughter-houses,<sup>1</sup> from 33,000 in 1905 to 48,400 in 1913, while in the case of the private slaughter-houses it decreased from 23,000 in 1905 to 18,800 in 1913.

The following table<sup>2</sup> shows the total killings in the co-operative factories, and, for later years, also in the private factories, and shows the great importance, both absolutely and relatively, of this branch of co-operative work:—

	Co-operative factories.		Private factories.
	Number of factories.	Number of pigs killed.	Number of pigs killed.
1888 ... ..	1	23,400	Not stated.
1890 ... ..	10	147,600	" "
1895 ... ..	17	528,800	" "
1900 ... ..	26	675,200	" "
1905 ... ..	32	1,031,600	" "
1907 ... ..	31	1,307,120	557,116
1910 ... ..	35	1,407,685	425,644
1912 ... ..	41	1,922,828	491,542
1914 ... ..	45	2,434,615	409,482

<sup>1</sup> Two co-operative slaughter-houses killing only or mostly large cattle have been omitted. Several of the other co-operative bacon factories also slaughter cattle, and in a few of them co-operators are bound to send their cattle as well as their pigs.

<sup>2</sup> From 1907 and onwards based on the reports of the Government veterinary inspectors.

The production of bacon in Denmark is very largely an export industry, and by far the greatest part of the bacon is sent to Great Britain, most of it being so-called "Wiltshire cut" bacon, *i.e.* sides with the gammon or ham attached. In 1905 only 7·1 per cent. of the number of pigs killed at the co-operative factories were for consumption in Denmark, and only 4·6 per cent. of those killed at the private factories, while the corresponding figures for the year 1913 were 7·7 per cent. and 8·3 per cent. The value of the produce exported from these factories in 1913 amounted to one quarter of the value of the total export of Danish produce. In 1913 the co-operative factories turned out pig produce to the value of £8,794,000, of which £7,355,000 represent bacon and hams; the corresponding values for the private factories were £1,722,000 and £1,394,000.

Fifteen co-operative factories have combined to form a limited company, the Danish Bacon Company, Ltd., in London, which undertakes the export to England and sale of bacon from these factories. The company, in Cow Cross Street, West Smithfield, employs 150 people, and acts as wholesale merchants.

The average capital value of a co-operative bacon factory (*i.e.* the value of buildings, machinery, fittings, goods on hand, etc.) is about £17,700, with an average debt (loan on buildings and working capital) of £8,800.

In the year 1897 the Co-operative Bacon Factories formed The Union of Danish Co-operative Bacon Factories, with an office in Copenhagen, and the following year M. P. Blem was elected chairman of the Union, and retained that position till in 1908 he became a director of the Credit Association for the Islands. The Union has in many ways been of service both to the factories and to the country in general. It effected a very cheap marine insurance for bacon, whereby the factories saved an appreciable sum annually. It averted a strike in 1902 which had threatened to stop the shipping between the Danish port of Esbjerg and Harwich, by which route most of the Danish bacon was shipped to England; as the dock labourers in Esbjerg intended to assist the stokers, who stood out for higher wages, by refusing to load the ships, which would have caused a great loss to the farmers, the Union arranged so that

a sufficient number of co-operators from slaughter-houses and dairies were ready to undertake the loading themselves, and when the dock labourers saw this they refused to go on strike. Both the Union and the individual factories have taken a considerable interest in the improvement of the breed of bacon pigs by getting good boars of Yorkshire and of Danish breeds stationed in various districts. In 1913 the Union took over the charge of a special effort to assist farmers in the improvement of the breed of pigs, which had hitherto been carried on by the agricultural societies by the aid of a large grant from the State. It had been found that the best bacon pig could be produced by crossing pure Yorkshire and Danish pigs, and "breeding centres" of these two breeds were therefore kept, from which farmers could buy breeding animals. In 1902 the State<sup>1</sup> offered an annual grant of £2,500 in support of these centres, and the country was divided into seven districts with a committee in each charged with supervision of the breeding centres. These were herds of either of the two breeds, which had been found to be of good quality and to breed true. The chairman of the District Committee was appointed by the Minister of Agriculture, one member by the Provincial Association of Agricultural Societies and one by the Co-operative Bacon Factories in the district. The Government Live Stock Commissioner supervised all the centres through his assistants, of which he has one in each district. By the revision of the Law of 1902 the grant by the State was from 1912 reduced to £1,400, and it was only given on condition that a similar amount was given "from other side." The Agricultural Societies could not see their way to vote that sum; the Union of Co-operative Bacon Factories therefore stepped in, voted the money, and took over the principal part of the work which is carried on, on the same lines as before, by supporting "breeding centres" of Yorkshire and of Danish pigs. The Union also supports three experimental stations where pigs from the various centres are kept in order to ascertain which of the two breeds gives the greatest increase in weight for a certain amount of food, and which produces the best bacon. The District Committees

<sup>1</sup> By Law on Breeding of Domestic Animals, 1902. See under Pig Breeding Societies.

consist of the district assistant of the Live Stock Commissioner and two members elected by the Co-operative Bacon Factories in the district. The experimental stations are under the supervision of a Committee to which the Union of Co-operative Factories elects two members, and the Government Experimental Station in Copenhagen a third member.

The assistance of the Co-operative Bacon Factories and of their Union has several times been sought and readily obtained by the Minister of Agriculture, and recent legislation has been thereby very much facilitated. By a Royal Decree of 30th August, 1906, it was provided that all slightly salted pork, including bacon, intended for export, should, when exported from Denmark, bear a mark having some resemblance to the Lur Brand for butter described in the previous chapter. The mark is as shown in the illustration.



By the Law of 27th May, 1908, on the Control of the Export of Meat,<sup>1</sup> all slaughter-houses, where animals are slaughtered for export, must be registered under a number. This number is to take the place of 00 in the above mark. The stamping or marking of the meat takes place after a thorough veterinary examination of the pigs before slaughter, and of the carcass and all the organs after slaughter; both this examination and the marking is done by veterinary surgeons appointed by the Minister of Agriculture, one or more at each slaughter-house. The above mark in red is used only for carcasses and offal of pigs of Class I.A. and "pigs of Class I.A. shall comprise only such pigs of Class I. (*i.e.* the best class) which do not suffer from rhachitis, and in which or in the organs of which no trace

<sup>1</sup> An English translation of this Law and the Regulations and Instructions issued concerning the Control of the Export of Meat from Denmark, may be had by applying to Harald Faber, the Danish Agricultural Commissioner, 7, Idol Lane, London, E.C.3.

of a tuberculous deposit has been found or from which no part of the pleura or peritoneum has been removed." No meat or offal of pigs other than of Class I.A. must be exported from Denmark to the United Kingdom, and all must be stamped or marked with the above Lur-stamp. All sides of Danish bacon exported to Great Britain are, therefore, "Lur-branded," *i.e.* stamped on at least three places with this mark in red, the number in the stamp indicating from which factory the bacon is derived, and the stamp itself giving a guarantee of freedom from disease surpassed by that of no other State guarantee. On the 16th April, 1909, the Lur Brand for "Carcases of pigs, parts of carcasses of pigs and other edible parts of pigs, all for use as food, such goods being exported from Denmark," was registered under Section 62 of the Trade Marks Act, 1905, in the name of the Danish Board of Agriculture.

CO-OPERATIVE BACON FACTORIES.

	Number.	No. of Co-operators.	Pigs killed 1,000.	Turnover £1,000.	Co-operative killings as per cent. of total killings.
1888 ...	1	1,218	23	55	—
1890 ...	10	15,648	147	440	—
1900 ...	26	60,000	660	1,538	—
1910 ...	34	90,000	1,397	5,769	—
1921-25	45	169,433	2,436	23,604	81.7
1926 ...	48	176,750	3,132	22,313	84.1
1927 ...	48	180,221	4,203	22,368	84.4
1928 ...	48	179,876	4,473	24,879	84.8
1929 ...	51	185,038	4,140	27,396	84.5
1930 ...	59	—	5,101	27,637	83.5

## DANISH CO-OPERATIVE EGG EXPORT SOCIETY

(*DANSK ANDELS-ÆGEXPORT, OR D.A.Æ.*)

IN the middle of the nineteenth century poultry-keeping was very much neglected in Denmark, and there was hardly any trade in the products such as eggs, fowls, geese, or turkeys, except just in the neighbourhood of Copenhagen, and little was produced beyond what was consumed by the farmers themselves. The price of eggs was generally four a penny all the year through; only in winter did the price in the capital rise to as much as 2s. 3d. per score, when as often happened there was a scarcity. In fact, during the first half of last century poultry-keeping was less important than in the Middle Ages, when monks from England and Germany had settled in the country and introduced various culinary refinements. When in 1865 the first direct steamship communication with England was established, an export of eggs began, at first on a very small scale. The cheap Danish eggs found favour in England, and Danish farmers gradually found that even poultry-keeping could be made profitable. About the year 1870, 50,000 score of eggs to the value of £1600 were exported; 20 years later 5,000,000 score to the value of £270,000; the value of the export gradually rose to about £350,000; but then it seemed to have reached its maximum, and for some years it did not increase. The number of poultry in Denmark increased from 4,600,000 in 1888 to 5,900,000 in 1893.

The reason why the trade in and export of eggs stagnated was the growing complaints from English dealers. As the production of eggs both in Denmark and other countries supplying the English market is seasonal, being large in spring and early summer and rapidly decreasing during the autumn,

while it almost ceases during winter, the price of eggs shows great fluctuations, increasing from week to week during autumn and winter and falling rapidly in the beginning of the year. The temptation to hold back eggs in autumn before selling and shipping them was therefore very great, and to this temptation many of those who handled the eggs in Denmark in the eighties and early nineties succumbed. There were many middlemen between the hen and the English consumer. The farmers, or rather the farmers' wives, gradually learnt to increase their profits by holding back the eggs one or more weeks during the latter half of the year. The hucksters who collected eggs from the farmers were equally clever, and the merchants who bought from the hucksters or had their own collectors, likewise tried to improve their position by the same short-sighted policy. The result was that more and more Danish eggs arrived in England in a bad condition, and often even quite useless. The means of examining eggs whereby it is now fairly easy to detect stale eggs, were less developed in those days or not made sufficient use of. Serious complaints from large English importers were received by the Royal Agricultural Society of Denmark in 1889, and proved to be only too well founded. The Society tried to influence the farmers and local buyers of eggs by means of reports in the agricultural and local daily papers, explaining how dishonest it was to sell stale and kept eggs as fresh; eggs should be disposed of once a week, the nests should be kept clean, etc. But all this had next to no effect. The merchants and shippers were, or believed themselves to be, in this difficulty, that if they refused to pay farmers for eggs manifestly kept or even partly spoiled, farmers would sell to competitors, and they would not receive any eggs themselves, neither fresh nor bad; the price for eggs, as delivered by the farmers, had therefore to be fixed so as to allow for losses by spoiled eggs, which losses, as in all similar cases, ultimately fell on the producer. Fresh eggs were, therefore, during about one-half of the year quoted considerably below their real value.

It was natural enough, when this unsatisfactory state of affairs began to be realised, that attempts should be made by the farmers to remedy it, especially as no help seemed likely

to come from the shippers. A beginning was made by forming local societies, the members of which bound themselves to deliver their eggs weekly and never to send any stale eggs. Such societies gradually obtained somewhat higher prices during the latter half of the year. Some of the shippers also formed similar local societies amongst their egg-suppliers. This was a step in the right direction, but it had only a local application, and did not influence the trade and export of eggs as a whole. In 1894 an attempt was made by the Agricultural Society of Horsens to get the egg producers all over Jutland to combine to form one large society for the improvement of the egg trade. The society was formed, but failed to secure the necessary support. The same result followed similar attempts at other places. But although these attempts did not succeed, they helped to draw the attention of many people to the need of reform, and they all pointed in the right direction.

Among those who interested themselves in the improvement of the egg trade were Severin Jörgensen, mentioned in a previous chapter for his inestimable services to the Co-operative Distributive Societies and their joint wholesale trading, and two village schoolmasters, Frederik Möller and P. Rasmussen, who were teaching peasant children in elementary State schools in the country near Vejle. These men, with the experience acquired from other agricultural co-operative work in mind, were the first to perceive that in order to get egg-producers interested in the egg trade and combine in a large society, it was not enough to ask them to improve the quality of eggs sold to dealers. It was necessary to go the whole length, to do away with the hucksters and agents who travelled the country districts to collect eggs, and to form a society not only for collecting, but also for trading in and exporting eggs. Further, it was necessary to be able by an efficient control to ensure that only fresh eggs were sent in, and in order to enforce this principle it was intended to fine such members as should send in stale eggs or eggs kept over. For this latter purpose a system of marking eggs was proposed by which it could be seen at once from which producer any egg had been delivered.

The Agricultural Society of Vejle Amt was approached, and Fr. Möller and P. Rasmussen attended a committee meeting at

which a special committee was appointed to consider the proposed reform of the egg trade. Opinions were divided on two very important questions, whether local societies should be aimed at or one large society for the whole country, and whether the proposed marking of eggs was advisable. English merchants were consulted and discouraged the idea of marking eggs. Nevertheless, Möller and Rasmussen considered the success of the reform inextricably bound up with the question of marking. Severin Jørgensen wrote to the Co-operative Wholesale Society in Manchester, who sent a very sympathetic reply, and later on the C.W.S. gave the newly started Egg Society their practical support by purchasing largely from the Society. Möller also was very decidedly of opinion that one society should be formed for the whole country with local branches. This latter point was carried at a meeting held in October, 1894, and on the 27th of February, 1895, at a meeting in Vejle, "Dansk Andels Egeexport," or "The Danish Co-operative Egg Export Society," was formed as a society for the whole country, with Fr. Möller as its chairman, a position which he holds to the present day, having resigned his modest office as a village schoolmaster a few years after the formation of the Society. The marking of the individual eggs was introduced from the first, and this striking innovation which has since found many imitations in various countries, both genuine and otherwise, has brought all the advantages which were hoped for.

The Society began operations in April, 1895. It has branches all over the country; each branch has its distinctive number, and each member has his number within his branch. Before the eggs are delivered to the collector for the branch, each egg is marked by means of a rubber stamp with the number of the member and the number of the branch, and these two numbers prove the origin of the egg, so that when a "spotted" or stale egg is delivered it can at once be seen who is the offender. At the packing and exporting warehouse the trade mark of the Society is stamped on each approved egg next to the two numbers.

D.A.Æ., as the Society is called in the trade, started with 24 branches, and less than 3000 members, it now counts 540

branches with about 45,000 members. The turnover was in 1896 £39,100 and in 1915 £426,000. The Society met from the beginning a fierce competition from private exporters. By avoiding the bad or doubtful eggs the Society received eggs of a higher average value than other exporters, and was therefore able to pay to its members a higher price per lb. than the prices paid by such exporters as felt themselves obliged to receive also the eggs which were kept over and which were anything but new-laid. That fact very soon turned the competition in the right direction. Being forced to pay farmers higher prices for their eggs, the merchants found themselves under the necessity of refusing to take eggs which had been held back on the chance of a rise in prices. The reform introduced by the D.A.Æ. therefore acted as a leaven that gradually leavened the whole egg trade. In that way this co-operative reform, more perhaps than any other, has had a far-reaching beneficial effect, far beyond the limits of the trade of the Society itself; it has also educated those farmers who stayed outside the Society to realise that the loss by letting eggs go bad must eventually fall on the producers, and it has shown private dealers and exporters that it is a short-sighted policy to take a momentary advantage at the cost of the reputation of the goods.

The complaints from English dealers about the quality of Danish eggs had driven Danish eggs from the market in London and the South, where competition with good eggs from other countries was felt even more keenly than in the North. When English dealers gradually came to understand the system of marking eggs introduced by D.A.Æ., and learnt to value the marked eggs as more reliable than other eggs, Danish eggs re-entered the London market. At the annual meeting of the Society in 1898 it was stated that the export of Danish eggs to the south of England during the first three years of the Society's activity had increased sevenfold, and that Danish eggs then realised the same prices as French eggs, which had previously obtained much higher prices and had almost monopolised the London market.

The revolution which the Society brought about in the Danish egg trade very soon increased the selling value of the

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eggs, and this induced many Danish egg producers all over the country to join the Society. Danish eggs were the only agricultural export from Denmark which during these years did not fall in price.

The turnover of the Society, expressed in tons of eggs, has been as follows :—

1895	...	...	95 tons		
1896	...	...	845 "	1901-05	... .. 4238 tons.
1897	...	...	1611 "	1906-10	... .. 4411 "
1898	...	...	1907 "	1911-15	... .. 4661 "
1899	...	...	2497 "		
1900	...	...	2794 "		

It will be seen that the trade of the Society grew by leaps and bounds till it had reached 4000 tons or about 600,000 great hundreds, and that after this it increased only slowly. This is to a great extent due to the above-mentioned fact that the reform in the egg trade had an effect far beyond the sphere of the Society itself. As other egg exporters and producers by competition were forced to realise that it was the best policy to deal in and export only fresh eggs, and as it became necessary to pay to all producers the real price for fresh eggs, the inducement to join the D.A.Æ. was lessened. But the effect of the reform on the trade of the whole country can be seen clearly from a statement of the average annual quantities and values of eggs exported from Denmark. The export has been almost exclusively to the United Kingdom.

### EXPORT OF EGGS FROM DENMARK TO U.K.

#### ANNUAL AVERAGES

			Quantities. (great hundreds.	Values.	Average value per gt. hundred.
1891-95	...	...	1,167,000	£ 383,000	6s. 7d.
1901-05	...	...	3,000,000	1,222,200	8s. 2d.
1911-14	...	...	3,600,000	1,747,200	9s. 1d.

A complete list of the quantities and values of eggs exported from Denmark during the years before and after 1895, shows very clearly how slowly the trade developed before the year 1895, and how quickly after that year. The trade increased

by only £50,000 during the five years 1891-95, but it grew by £100,000 annually during the next five years, showing that the turning-point was the year when this new development of co-operation began.

At first the headquarters of the D.A.Æ. were at Vejle in Jutland, and the export was carried on from that place. In 1900 the Society's head office was moved to Copenhagen, and, besides Vejle, nine local branches for the collection, sorting, packing, and export of eggs were gradually started. In several of these branch establishments eggs are preserved to be sold during winter as "pickled eggs," and at five branches poultry is received from members to be fattened and sold. The Society has not confined its activity to commercial matters, but has, since 1902, encouraged and improved poultry keeping by inviting breeders of fowls to enter for annual competitions at which their whole stock of poultry is judged according to its production during the year, the economy of feeding, the general management and the economic result. The object is to find and reward such strains of poultry as are good layers and to get good birds for breeding or sittings of eggs spread from them among the farmers. Since 1914 this work has been taken over by a Joint Committee appointed by the leading Agricultural Societies and the D.A.Æ. with the support of the Ministry of Agriculture.

It will already have appeared from the above statistics of the egg trade that the D.A.Æ. has not brought under its immediate influence so large a proportion of the total trade in eggs as the corresponding co-operative undertakings concerned with butter-making and bacon manufacture. Only a minority of the egg producers in Denmark has joined a co-operative society for the sale and export of their eggs, and this is true, even when to the members of the D.A.Æ. we add the egg-collecting branches of the several Co-operative Bacon Factories which undertake to dispose of their members' eggs on similar lines to the D.A.Æ. An official inquiry in 1908<sup>1</sup> showed that about every fifth farmer was a member of an egg-collecting society. The number of poultry on their farms was quite 30 per cent. of the poultry of

<sup>1</sup> Statist. Meddelelser, 4 Række, 22 Bd. 5 Hæfte, Tab. 9, "Landbrugets Andelsvirksomhed," 1906.

the country. The next official inquiry was in 1909.<sup>1</sup> Between 1908 and 1909 the co-operative movement in the production of butter and bacon had made great strides. Not so in the egg trade. In 1909 18·2 per cent. of Danish farms with 26·7 per cent. of the poultry took part in the co-operative egg trade, or a smaller portion even than in 1908. In 1914 the number of farms in connection with co-operative egg collecting was further reduced. While co-operation in making butter and bacon was much more common among the middle-sized farms than among the smallest and largest farms, participation in the co-operative egg trade was fairly evenly distributed among farms of all sizes.

But the reform effected by the co-operative principles introduced by the D.A.Æ. has benefited all Danish egg producers. The annual average price paid to the farmers who delivered their eggs to the D.A.Æ. was in 1895 5·1 pence per lb., in 1900 5·5, in 1905 5·8, in 1910 6·1, and in 1913 6·9 pence per lb., and similar prices were paid also to other farmers. This has had the effect of largely increasing the stock of poultry. The number of fowls in Denmark was, in 1893, 5,900,000, in 1903, 11,600,000, and in 1914, 15,100,000.<sup>2</sup>

The constitution of this Co-operative Society differs somewhat from the usual type. The Society consists of local egg-collecting branches; the bye-laws of the local branch, which must have at least ten members, must conform to those of the Central Society and must, for instance, contain provisions making it obligatory for members to deliver all the fresh eggs produced, except those reserved for consumption in the household; to collect the eggs daily from the nests and to deliver them weekly; never to deliver eggs which are more than seven days old; the eggs must be stamped with the number of the local branch and of the individual member; the members must agree to pay a fine of 5s. 6d. if found to have delivered kept or bad eggs. If these conditions are fulfilled the committee of the local society or branch can apply for membership in the Central Society, the D.A.Æ. The bye-laws of the D.A.Æ. are binding

<sup>1</sup> Statist. Meddelelser, 4 Række, 36 Bd. 4 Hæfte, "Deltagelsen i Landbrugets Andelsvirksomhed, 1909," publ. 1911.

<sup>2</sup> Statist. Tabelværk, 4 Række Littr. C. No. 8, 1894; Statist. Meddelelser, 4 Række, 47 Bind. 2 Hæfte, 1915.

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on the members of the local branches as well. The local branch has its own committee. This committee elects a delegate to represent the branch. The delegates of all local branches in a county (Amt) elect one member to the County Committee. The General Meeting consisting of the delegates, one from each local branch, elects a managing director and four other directors. Members of the County Committee and the directors take part in the general meetings, but without a vote, unless they happen to be also delegates from a local branch. One half of the nett surplus at the end of the year is paid to the local branches in proportion to the value of eggs sent in by them, while the other half is set aside for the reserve fund and working capital, which is credited to the local branches in the same proportion. The liability of the local branches for the debt of the Central Society is restricted to their several shares in this reserve and working capital;  $4\frac{1}{2}$  per cent. interest on these shares is paid annually together with the surplus.

### THE DEVELOPMENT OF THE POULTRY INDUSTRY IN DENMARK.

Year.	Number of Fowls.	Net Export of Eggs, Yearly Averages.		
		Year.	Gt. Hundreds.	£
1888 ...	4,600,000	1891-95 ...	1,100,000	300,000
1898 ...	8,800,000	1901-05 ...	3,000,000	1,200,000
1914 ...	15,100,000	1911-15 ...	3,700,000	1,900,000
1925 ...	20,600,000	1921-25 ...	6,400,000	7,300,000
1929 ...	22,000,000	1926-29 ...	6,500,000	4,800,000

As already mentioned, some Co-op. Bacon Factories, viz. 8, collect and export their members' eggs. The extent of the co-operative egg export, by D.A.Æ. and by the bacon factories, is shown below :—

### EXPORT OF EGGS, in Great Hundreds.

Year.	By D.A.Æ.	By Bacon Factories.	In per cent. of Total Export.
1919-23 ... ..	710,000	480,000	18.3
1924-28 ... ..	1,280,000	650,000	22.5
1929-30 ... ..	1,160,000	490,000	30.7*

\* Calculated by value, the percentage was 27.2.

## CO-OPERATIVE BUTTER EXPORT SOCIETIES

WHEN the Co-operative Dairy Societies were formed their chief aim was to improve the technical side, the manufacture of butter and, in a smaller degree, of cheese. The disposal of the produce was left to the merchants to whom it was sold, in the usual way, under contracts or agreements for one year at a time, the butter to be delivered weekly and the price to be regulated by the official Copenhagen Butter Quotation. That was the way in which nearly all the "estate butter" was sold. The buyers were mostly Danish merchants specialising in the butter trade, and most of the butter went to Great Britain. The largest buyers were the Co-operative Wholesale Society in Manchester and the Maypole Dairy Co., London, and these found it to their advantage to have their own buyers in Denmark, where the first now has offices in Copenhagen and four provincial towns, while the latter has its chief representative in Copenhagen with branches in two or three towns. Other English firms have, from time to time, had their own buyers in Denmark.

In one respect the trade and export of butter to Great Britain would seem to be carried on on very economical lines, inasmuch as the number of middlemen between the producing Dairy Societies and the English retailers has been gradually reduced to a minimum. In many cases Danish exporters buying from the dairies would sell direct to English retailers, or English wholesale merchants or even retailers would buy direct from Danish dairies. It may safely be said that no other agricultural produce is sold to consumers in another country at so small an advance in price beyond what the farmer receives as is Danish butter in England. Nevertheless the producers have, from time to time, raised complaints against the way in which the butter trade was carried on.

As has been said, the price paid for butter was regulated by the Copenhagen quotation, and a premium over and above the quoted price was paid to certain dairies for excellence of quality. At least, that was the origin and intention of the so-called "overprice," but by stress of competition it became more and more common to pay overprices, and these, it was found, gradually lost all relation to the quality. The stimulus to improve the quality of the butter in order to obtain a better price was thereby lost. The quality of the butter certainly became more and more uniform throughout the country on account of improved dairy methods, and was improved all round by several means, among which should be mentioned the Butter Shows of various kinds—local, provincial, and the State Butter Shows at Copenhagen, which latter are now compulsory by Law for all dairies using the "Lur-Brand." At the same time Danish farmers on many occasions attempted to introduce a reliable system of payment according to quality, but found that they were unable to obtain this so long as the butter trade was carried on in the usual way. There is no doubt but that in the early days of the butter trade the criticisms of the quality of the butter, including flavour, colour, salting and packing, amount of brine, etc., which exporters addressed to the dairies together with a deduction from the amount due to them, helped the managers to improve the quality and to make the butter conform more closely to the wishes of the English consumers. But in many cases the farmers suspected criticism to be merely an excuse for a reduction in price, which they considered uncalled for. The greater the perfection of the dairy industry and the greater the uniformity and reliability of the butter when it left the dairy, the less readily were farmers and dairy managers willing to accept an individual merchant's criticism of their butter. A comparison between the quality of a dairy's butter, as found by the careful judging at butter shows and the price paid for that dairy's butter, showed that the price stood in no relation to the quality. There were other, mostly very technical, reasons for disagreement between producers and merchants. Farmers therefore began to think that they might obtain certain advantages by taking the sale and export of butter in their own hands.

This has been effected by means of the amalgamation of Co-operative Dairy Societies; as a rule, those in a limited district have combined to form a Co-operative Butter Export Society. The dairies bind themselves to sell all the butter they make, beyond that supplied for the use of their members, through the Export Society. The butter is paid for in the usual way according to the Copenhagen quotation, but some modification is made in the price according to the quality as found by weekly testing of sample casks. The surplus at the end of each year's trading is returned to the Dairy Societies in proportion to the amount of butter delivered by each. The Dairy Societies can only withdraw from the Export Society at the end of a working year, and must give six to nine months' notice of withdrawal. They are jointly liable for the debts of the Export Society; sometimes, however, only to a limited extent. The affairs of the Export Society are managed by the general meeting at which each Dairy Society is represented by a number of representatives, generally including the dairy manager. The general meeting elects the directors and auditors, and the directors appoint a manager who carries on the business of the Society, consisting chiefly in exporting the butter to Great Britain. Membership in the Export Society is not confined to Co-operative Dairy Societies, privately owned dairies being also accepted as members in some or all of them.

The first of these export societies was "The Farmers of Denmark Butter Export Association," formed in 1889 by 85 Co-operative Dairy Societies in Sealand and the islands of the South. But as this association was not managed on co-operative principles, but rather was a kind of "one man's affair" founded on spite and political prejudice, and came to an ignominious end, there is no need to do more than just mention it. The reform in the Copenhagen quotation in 1894, brought about by the strong opposition to the increasing "overprices," gave rise to the formation of some export societies which still carry on business.

*The Farmers of South Funen Butter Export Association* began operations in January, 1895, with 18 members, consisting of dairies in the south of Funen with its headquarters at Svendborg. There are now 29 members. The annual turnover has

increased from £87,000 during the first year to £877,000 during the last year for which the accounts are known. Payment is made according to quality.

*The Danish Co-operative Butter Company* in Esbjerg was formed in 1895 by 9 Co-operative Dairy Societies as D.C.B. Factory for the purpose of packing and exporting unsalted butter, but has developed into an export association exporting the usual salted butter in casks and boxes, and comprises now 52 dairies in different parts of Jutland. The annual turnover has increased from £111,000 in 1895 to £611,000 during last year. Weekly judgings of butter are held, and prizes awarded to those dairy societies that obtain the highest points during the year.

*The Mithern Jutland Butter Export Association*<sup>1</sup> in Horsens began in 1898 with 5 dairies, and now numbers 37. The turnover has increased from £72,000 to £500,000. Payment is made according to quality, and prizes are awarded to the managers of the best dairies.

*The Aalborg Butter Export Association* in Aalborg began operations in 1901 with 8 dairies, and now numbers 32. The turnover has increased from £42,000 to £311,000. Payment is made according to quality.

*The North Jutland Butter Export Association* at Skive began in 1904 with 21 dairies and has now only 17 members, but the turnover has nevertheless increased from £154,000 to £195,000 owing to increased production. Payment is made according to quality as per weekly judging.

*The Danish Dairies' Co-operative Butter Export Association*, or "Danish Dairies," was formed in 1904. It is the only one of these Associations which has, as members, co-operative and private dairies all over the country. The headquarters are in Copenhagen, and there are branches in 6 provincial towns. At first it had 66 members, but now numbers 190. The turnover has increased from £498,000 to £1,580,000. Payment is made by quality and prizes are awarded for the finest quality. The property of the Association is the security for the debt of the Association, the members are liable only for such loans as

<sup>1</sup> "Mithern Jutland" is a somewhat novel designation "made in Denmark" analogous to Northern and Southern, and stands for Mid Jutland.

the board of representatives, elected by the general meeting, shall procure from a bank ; for this loan members are jointly liable in proportion to the value of butter delivered by them during the previous year, the total liability of members is, however, not to exceed a sum of £11,000.

Five more Butter Export Associations have been formed, viz., one in *Vejde*, one in *Eastern Jutland*, two in *South Jutland* and one in *Haderslev* (Slesvig).

The eleven B.E.A. comprised in 1930, 570 dairies out of a total of 1,665 dairies, and they had a total turnover of more than £11,000,000.

Of the value of the total export of butter the eleven Co-operative B.E.A. dealt with :—

In 1911	...	...	...	16.7 per cent.
In 1914	...	...	...	20.8 „
In 1924-28	...	...	...	39 „

showing that an increasing percentage of the butter export is being carried out through these Co-operative Associations.

Before the war there was a duty on butter imported into Germany, but not on cream, and German dealers found it to their advantage to buy cream from the dairies in Denmark and churn it on the other side of the boundary. As soon as the war broke out, the duty on butter in Germany was repealed, with the result that the export of cream from Denmark to Germany ceased at once, and the Danish dairies in question reverted to the original export of butter. Many of these dairies joined the Co-operative B.E.A., and in the years 1919-23 as much as 40 per cent. of the total export of butter took place through the then existing 10 Co-operative B.E.A.

## BREEDING SOCIETIES

### CATTLE BREEDING SOCIETIES; BULL CLUBS

CATTLE breeding has been of great importance in Danish agriculture from the earliest times. In the early part of the Middle Ages the export of fat bullocks was one of the chief sources of income of the kingdom, at times even the chief source. As early as 1457 a Royal Decree was issued regulating the trade in steers. At first Germany was the chief market, but towards the end of the sixteenth century the Netherlands became Denmark's best customer, for the Netherlands were in those days the wealthiest trading nation and the greatest maritime power, as Great Britain is to-day. The Jutland ox was specially esteemed for its fine beef. For a couple of centuries Dutch cattle dealers travelled regularly each spring in Denmark and went from farm to farm to buy. Fattening bullocks for export was then the main branch of Danish agriculture, and the chief consideration of the country gentleman, a point which is illustrated by the following little story. On a certain farm in Jutland the owner used to have family prayers every morning during the winter. In summer there was no time to spare for prayers. These began on the day when the bullocks were stabled, and ceased on the day when the bullocks were sold and sent away. "Now the steers must have gone, for there are no family prayers at the mansion," the neighbours used to say.

This flourishing trade with Holland came to grief, and the first interference came from the Danish Government when, in 1718, it tried to raise money by increasing the export duty to £1 per head of cattle. This was resented by the Dutch and Brabant cattle dealers, and their visits to Denmark fell off. Six years later the farmers in the Netherlands induced

the States General to impose a high import duty on Danish cattle, and in 1770 their importation was totally prohibited. Danish cattle were then sent to the rich marsh lands in Holstein to be fattened for market, and then sold to the Hanse towns, but the prices realised were not so high as before. Cattle plague also and other misfortunes helped to reduce the export. While at the beginning of the eighteenth century the export amounted to about 50,000 steers, it was at the end of the century barely 5000 to 8000. The large estates gradually left off fattening steers, and took to dairy farming instead. The stock of cattle was reduced, and much grass land was turned into arable land for corn growing. Jutland kept on producing steers longer than the islands, but the farmers sold the steers as store cattle to be fattened on the Holstein marshes. In 1774 there were, besides calves, about 500,000 head of cattle in Denmark. The great agricultural reforms at the end of the eighteenth century enabled the smaller farmers, that is the peasants, to increase their stock, and in 1838 the number is given as 850,000, but the quality of them had very much deteriorated. This was particularly the case with the peasants' cattle which formed the great majority. The cattle were looked upon as "a necessary evil," kept partly in order to convert hay and straw into manure and to get a scanty supply of milk for home use. The aim of agriculture was corn-growing; the soil had been enriched in the previous period, and by marling, draining, better rotation and improved implements, the manurial residue in the soil was made available, so that the fields yielded good corn crops without the addition of much manure, while cattle breeding was neglected.

The peasants had no idea of cattle breeding or of the points of good cattle. The cattle dealers bought the best animals, and the inferior stock left was used for breeding. Both bulls and cows were allowed to breed at too young an age, cows in calf were badly treated, and young stock insufficiently nourished. The poorer the district the worse were the cattle. Such was the state of cattle breeding among the peasants at the end of the eighteenth, and the first half of the nineteenth, century. But before the middle of last century the necessity of producing more manure to maintain the yield

of corn crops began to be understood by the large landowners, and more attention was paid to the cattle. Unfortunately, one of the first means to improve it was sought in crossing with superior breeds from other countries, and Ayrshire, Swiss, Tyrol, Angeln, Dutch, Shorthorn and other English breeds, were introduced, and indiscriminate crossing was practised. It was in Jutland that the farmers first began to realise the evil result of this system, and to advocate improving the native Jutland cattle by judicious selection and breeding within the breed. At the first large Farmers' Meeting, in Randers, 1845, a resolution was carried to the effect that "as Jutland possesses a breed of cattle not only admirably adapted to the country's own use, but highly appreciated abroad both for fattening and as dairy cattle, this breed should not be crossed with any other breed, but improved by suitable means according to local conditions." On the islands the crossing with foreign breeds was superseded by an improvement effected by means of the red dairy cattle from Angeln in Slesvig which was very closely related to the native red or red and white cattle on the Danish islands.

About 1830 the Royal Agricultural Society of Denmark appointed commissioners in the different districts (Amter) to report on "the present economical conditions in the Danish provinces." In the valuable reports received the question of improving the cattle of the country was dealt with, and most of the commissioners were of opinion that what was chiefly required was to instruct the peasants in the knowledge of good cattle breeding, the importance of using the best animals only for breeding and the necessity of rearing the young stock in a better manner. One report even went so far as to propose compulsion; the necessary number of bulls of good quality should be provided in each district; inferior bulls should be castrated; a punishment should be inflicted for letting bulls stray, and so on. The majority recommended a system of prizes for good bulls, while some favoured the old-time system of each village having "a village bull," which should be of a good milking strain. Others suggested that the State should buy good bulls and station them in the districts where they were most needed.

Among these commissioners was the poet and author, pastor of a Jutland parish, Steen Blicher. Like all country vicars he had his farm or glebe. He was fully acquainted with agricultural questions, and a frequent contributor to various journals in which he warmly recommended important agricultural reforms in regard to a better rotation, reclamation of heathland and moorlands, the use of fallow and similar subjects. He understood and felt a great sympathy for the peasant class, and has described it in his classical writings. He strongly advocated the improvement of the native breeds of cattle, and formulated a proposal which although it was not understood or appreciated in his time, laid down the principles which, fifty years later, were taken up by the cattle-breeding societies and according to which these are still carried on. In his description of the district of Viborg, published in 1839, he does not agree with the suggestion of prizes. "Rather would I recommend that several farmers by joint action should try to imitate the good example given by some, viz. by a judicious selection of breeding animals, cows as well as bulls, to improve our national breed of cattle." The crossing with foreign breeds had fortunately in several districts had very little effect on the native stock, and particularly was this the case in Salling land within the district of Viborg. "If several neighbours, large landowners, pastors and the well-to-do peasants with large farms were to join in a breeding society with suitable rules, the good results thereby acquired would spread in ever-widening circles. As the chief rules for such a society I would propose:—

"(1) The best animals should be obtained for breeding purposes, were they ever so costly, difficult to find and far to fetch.

"(2) The young stock should be reared well and liberally nourished.

"(3) The heifers should not be served until three years old.

"(4) No bull calf should be castrated if anybody outside the society would buy it for breeding purposes.

"(5) No member should be allowed to sell breeding cows of the approved breed as long as they could be in calf, until his entire herd consisted of cows of the improved strain.

“(6) Peasants in the neighbourhood should have the opportunity of getting their cows served, free or for a small fee, on condition that they undertake to rear and keep for breeding the resulting cow-calves.”

Such were the far-sighted views of this country parson and poet.

As already mentioned, it was the impoverishing effect of continuous corn-growing which led progressive landowners to understand the necessity of returning the nutriment taken from the soil by keeping a larger stock of cattle and feeding them better. This again led the leading farmers to improve the quality of their cattle. But the progress was confined to the large estates. Then the State stepped in to further the movement. By the first Law for Improving the Breeding of Domestic Animals, of 31st March, 1852, the State offered a modest sum of £844 annually as prizes for the best breeding animals, horses, cattle, sheep, and pigs, to be paid through the Minister of the Interior to those districts where the agricultural societies took an active part in the improvement of the stock; the grant from the State to a district was not to exceed the amount contributed by the district from its own means, and no more than £44 should be given to any one district; the prizes were to be awarded at the annual cattle shows by judges elected by the agricultural societies. This proved to be a very effective help to self-help. Cattle shows had been held at intervals before that time, but from 1852 they became common all over the country, and had a considerable influence in demonstrating to farmers which animals were suitable for breeding purposes. Later on it was understood how important it was to know the pedigree of good animals, and herd-books were kept, at first by private farmers and from 1881 by public bodies. By degrees farmers learnt to see the importance of keeping more cattle and cattle of better quality. In 1881 a kind of breeding society was formed on the island of Mors in the north of Jutland, famous from of old for its fine horses and its good cattle. The fear that the cattle might be spoiled by injudicious crossing with Shorthorns induced a landowner to form a society for the improvement of the native cattle. The members were to agree to use for breeding only

such bulls as were approved by a committee of judges and only cows of the native breed ; they were to rear bull-calves every year, one or more up to five according to the size of their farms ; yearling bull-calves to be exhibited at the annual show, and if approved, to be shown again next year ; if again approved and awarded a prize, the bull should not be sold to others than members unless it had first been offered to the committee ; in default the owner was to pay a fine ; all prize bulls were to be shown again at next year's show until the age of three years. All bulls approved for breeding were branded, and their name, number, and pedigree were entered in the herdbook of the society. All bull-calves not approved for breeding, and therefore not branded, were to be castrated. This society is still in existence.

When the co-operative dairy societies sprang up all over the country the peasants realised more and more the importance of keeping dairy cattle able to convert the crops of the fields into milk, and the means adopted to obtain such cattle were sought in co-operative breeding societies. Thus one kind of co-operative action led to another, as has so often been the case. And, as in other instances, it was by private initiative that the beginning was made. Two farmers, one a tenant farmer on a large estate in Sealand, J. M. Friis, Lindersvold, the other an owner of two estates near Randers in Jutland, Fr. Hvass, in 1884 started bull clubs for the improvement of the local breeds, the Red Danish Dairy Cattle in Sealand, and the Black and White Jutland Cattle. It was the leading idea of Friis that if the undertaking was to bear fruit it was necessary that the agricultural population of the district should take part in the work and in the management, and that members should not be asked to pay a contribution in cash. When his plan had matured in his mind, he therefore invited four of the leading peasants to associate themselves with him, and with their support he laid the plan before a large meeting of farmers convened for the purpose. The rules of his bull club contain the following provisions : Members to pay no subscription, but to undertake to let such of their cows, as were approved by the committee of the club, be served by the club bull at a fee of 6s. 6d., smallholders (Husmænd) to pay only half fee ;

the calves not to be slaughtered or sold outside the club unless they had previously been offered to the committee; the committee to purchase the bull and to judge every year the cows belonging to the members and to select those suitable for breeding; no member to have more than ten cows served and no cow to be served more than three times. If the club should show a deficit this was to be made good by members in proportion to the number of breeding cows owned by them. Members had one vote each, irrespective of the number of cows. Friis was very active in bringing about the formation of similar bull clubs in other districts in Sealand. He travelled about, convened meetings or was invited to attend such, and he had a considerable power of persuasion, frequently representing it to peasants as a matter of vital importance to the whole country that they should then and there form a bull club for their district, and he generally succeeded.

Hvass was equally successful in Jutland. His idea was that each parish should have its bull club, that the local agricultural societies in the district of Randers should take the matter in hand, each in its own locality, and that the bull clubs should be under the control of the committee of the Association of Agricultural Societies. The bulls should therefore be exhibited every year, both at the local cattle shows and at the general show for Randers district. The bulls should be approved by the committee of the Agricultural Societies, which should also inspect the calves and young stock produced. A similar co-operation between the bull clubs was also arranged in Sealand, and Associations of Bull Clubs were formed under the name of Cattle Breeding Societies, which designation, however, is also used for Bull Clubs outside Sealand.

The State had taken very little notice of the early efforts in the co-operative development of agricultural industry with regard to butter and bacon, and had been far from friendly to the Co-operative Distributive Societies. Its attitude towards the Cattle Breeding Societies, formed for the purpose of co-operative development of the animal industry, was, on the other hand, one of the most friendly and effective help and encouragement. It is not so easy to see why this distinction was made, although it might be argued that the butter industry

was more directly commercial, and therefore a less fit object for State aid. On the other hand, it might be said that the State aid given to the Breeding Societies, by creating a largely increased demand, certainly did help the prominent breeder to realise prices for his animals which he would otherwise never have obtained. When the State stood aloof from helping the Co-operative Dairy Societies in their first years it was not because these were in no need of help; there was, for instance, the urgent need of technical instruction for the many young men who came forward to manage the hundreds of co-operative dairies which sprang up in the course of a few years. The assistance given by the State to the Breeding Societies was a very far-seeing and wise measure, and it has brought forth fruit in abundance, being, as it should be, help to self-help.

By a new Law for Improving the Breeding of Domestic Animals, of 1st April, 1887, the State went a considerable step further than giving a grant to increase the prizes awarded at shows. It placed a sum of £2780 annually at the disposal of agriculture to supplement "other measures" for improving the animal industry, and this was chiefly used for Breeding Societies for horses, cattle, sheep, and pigs, and the greater part was absorbed by the bull clubs. It was stipulated that, in order to share in this help, the breeding societies must be approved by the agricultural society or societies in the district or by the Provincial Federation of Agricultural Societies, and that the stallions or bulls bought and used should take prizes at the local or district show before the grant could be paid. It was also stipulated that the State grant should never amount to more than half the cost of whatever measure it was intended to supplement. This timely help had a considerable stimulating effect on the bull clubs. In the year 1887-88 there were 89 of these, and by 1891-92 their number had increased to 409. This increase had naturally the effect of reducing very largely the available grant for each bull, which for the year 1892-93 was only £4. In 1893 the grant was therefore increased to about £7000, of which sum £3330 was reserved for the bull clubs. The grant was, as before, administered by the agricultural societies. One-half could be awarded by the Provincial Federation, according to their valuation of the bulls; the

grant for a bull was limited to £6 13s. or to £7 16s. for bulls valued by the Federation. These grants were given independently of the contribution of the bull clubs, but on conditions that the rules of the club were approved by the Minister, and that they should contain provisions for the proper selection of cows to be served, for veterinary inspection of both bulls and cows, and also that the bull should be the property of the club. As bull clubs continued to increase in number the special grant for them was further increased in 1900 to nearly £4000 a year. The next Law, of 1902, again went one step further. Each bull club could obtain a grant of £8 7s., but the Provincial Federation could discriminate between the clubs in the province, so that the grant per bull could vary from £7 to £9 9s. according to the value of the bull and the work of the club in general. This Law further made a new grant of £1100 available for such bull clubs as, by showing superior young stock as the result of their work, gave proof of special opportunities for producing first class strains of cattle.

With this help from the State together with the work carried on by the many bull clubs, and by the agricultural societies, local, district, and provincial, the improvement of the stock of cattle proceeded at an accelerated rate, and was materially assisted by the two able Live Stock Commissioners, Messrs. Axel Appel and P. Aug. Mörkeberg, appointed by the State for the purpose, and by local advisers appointed by the Agricultural and the Cattle Breeding Societies. For first class bulls very high and, in Denmark, hitherto quite unheard-of prices were readily paid by the best bull clubs, with the result that private breeders were stimulated to continue their energetic work for the improvement of their herds. A very characteristic effect was soon noticeable in a change that came over the cattle shows. It was due to the fact that the improvement in cattle breeding was effected by the co-operative societies of the farmers in general and not by a few prominent breeders. As late as the early nineties most of the bulls at the cattle shows were shown by large estate owners, by special breeders, or were at least bulls from fairly large herds. But before the end of the nineties this was altered. Not only were most of the bulls then shown those belonging to bull clubs, but these bulls

often took the first prizes. That is to say, in other words, that the improvement of the cattle, instead of being restricted to the large herds belonging to the best individual breeders, was fully shared in by even the smaller farmers, and that even their cows were served in many instances by the best bulls available. This has resulted in a remarkable uniformity throughout the country in the cattle of the two native breeds. For the country itself this improvement in almost the whole stock was of the utmost value, and was one of the factors helping to produce the remarkable increase in the butter production mentioned in a previous chapter.

The State had undoubtedly materially helped to bring this about, and it reaped the fruit of its wisely planned help to self-help, the educational effect of which was very much enhanced by allowing the Associations of Cattle Breeding Societies and the Provincial Federations of Agricultural Societies to administer the State grants. In 1912 a change was introduced by the legislature. The Minister of Agriculture, in the course of the debate in the Rigsdag on a Bill for Improving the Breeding of Domestic Animals, stated in so many words that "the best Law on this subject is that one which gradually makes itself superfluous." Accepting this reasoning, though naturally with some opposition on the part of the representatives of the farmers, the Rigsdag resolved materially to reduce the help of the State, and at the same time to impose more stringent conditions for sharing in the grant. The grant per bull was reduced by one-half, and a new element was introduced. "Control Societies," to be described later, for examining individual cows with regard to their yield of milk in quantity and quality (that is, its contents of butter fat), had in the meanwhile been formed. The new Law provided that for bull clubs with half their number of approved cows entered in a "control society" the grant for the bull could be increased by 22s., while if three-quarters of the number of cows were entered the grant could be increased by 50s. per bull. The object of this provision was to bring about co-operation between bull clubs and control societies. Before we describe this co-operation, which was, to a large extent, successfully attained, a few statistics from official inquiries will be in place.

An inquiry held in 1909<sup>1</sup> showed that 1259 bull clubs receiving grants from the State were in existence in that year, of which 66 had been formed before 1890; in the following quinquennial periods new clubs were formed at an increasing rate:—

1890-94	...	...	...	98		1900-04	...	...	385
1895-99	...	...	...	157		1905-09	...	...	553

Much more than 66 clubs had been formed before 1890, but for one reason or another many of these had ceased to exist. The development during later years was as follows:—

	Number of			Grant by the State.
	Bull clubs.	Members.	Bulls.	
1900 ... ..	634	15,500	710	£ 4,000
1909 ... ..	1,259	31,300	1,464	12,220
1912 ... ..	1,072	not stated	1,228	10,580
1913 ... ..	934	23,400	1,123	5,000
1915 ... ..	925	23,100	1,048	4,800

In 1909 it was found that 29,777 herds with 532,955 head of cattle were in bull clubs, which was 16·5 per cent. of the herds in the whole country, and 23·8 per cent. of the cattle. An inquiry held with the object of finding in which group of holdings, grouped according to size, the highest percentage was taking part in this co-operative work, gave a similar result to that for the co-operative dairies and bacon factories, viz. that owners of farms of between 73 and 147 acres, that is the peasants, were the greatest supporters.

Size of holding.	In bull clubs were		Percentage of total number in the country districts	
	Herds.	Cattle.	of Herds.	of Cattle.
Less than 1½ acre ... ..	47	121	2·4	3·1
From 1½ to 12 acres ... ..	2,956	12,250	5·4	6·8
„ 12 to 73 „ ... ..	16,925	235,587	19·9	24·8
„ 73 to 147 „ ... ..	7,327	196,237	30·4	31·8
„ 147 to 589 „ ... ..	1,864	72,864	27·1	23·6
Above 589 acres ... ..	43	5,689	7·4	5·2
Total ... ..	29,162	522,748	16·9	24·1

<sup>1</sup> Statist. Meddelelser, 4 Række, 36 Bd. 4 Hæfte, 1911.

Owners of very large and of very small farms took little part in this work, the former likely enough because their herds were large enough to enable them to keep first-class bulls for their own use.

Bull clubs have formed District Associations for mutual help, the associations appointing advisers to assist clubs in the purchase of bulls, to bring about a uniformity in the by-laws and in the work, to advise in the selection of breeding cows, on the rearing of young stock, and to help in drawing up the herd-books. These District Associations have formed Central Associations, one for each of the three main provinces. It is a proof of the free and individual development of this, as of all similar co-operative work in Danish agriculture, that these Associations have been formed in a different manner in the different provinces. In Jutland most of the District Associations are common to the Bull Clubs and the Control Societies within the district, these two kinds of societies forming one joint association for the district. The District Associations form no central association; but the Federation of Jutland Agricultural Societies has a standing Committee on Animal Industry, and this acts as the central committee for the Associations of Bull Clubs and Control Societies, these electing one member on the Committee. In Sealand the District Associations, called Cattle Breeding Societies, form a Federation of Sealand Cattle Breeding Societies which works in intimate co-operation with the Federated Sealand Agricultural Societies. The Federation of C.B.S. and the standing Committee on Animal Industry of the Federated Agricultural Societies jointly elect the chairman of the Central Committee on Animal Industry. In Funen the Association of Bull Clubs and Control Societies is one of the members of the Federation of Funen Agricultural Societies, the chairman of the Association being a member of the board of the Federation.

#### HORSE BREEDING SOCIETIES.

Although horse breeding in Denmark has had its ups and downs, it has never known a period of depression similar to that experienced in cattle breeding. The Danish horse, which

probably meant a horse of the breed now known as the Jutland horse, was celebrated from the early part of the Middle Ages, and was one of the chief sources of income of the kingdom. In the first part of the thirteenth century, as mentioned in King Wolmer's Land Record (showing the king's revenue), there was a large export of horses, as many as 8400 going every year from Ribe (S.W. Jutland). The kings, knights, abbots and yeomen were all interested in horse breeding. The Frederiksborg Royal Stud for lighter horses was formed in the middle of the sixteenth century, and several Royal Decrees were issued to regulate horse-breeding; one by Christian IV., for instance, extended by a decree of 16th June, 1686, required all noble landowners and other estate owners to keep a number of brood mares according to the size of their estates; even country parsons were to keep two mares. A fine of about £5 a year was imposed for each mare short of the required number. By a decree of 23rd December, 1778, the State began giving prizes for stallions and later on also for mares. The breeding was improved by crossing with stallions from the Royal Stud at Frederiksborg, and by imported stallions. During the last century the Frederiksborg breed was improved by thoroughbreds, stallions from the East and others, and was the leading breed in Sealand. Even in Jutland, with its native breed of fine heavy horses, crossing with the lighter Frederiksborg stallions was practised, a stud being formed in 1824 at Moesgaard near Aarhus, from which the stallions travelled all over Jutland during spring. To strengthen this stud many half-bred Yorkshire stallions were imported. Also thoroughbred racehorses were imported, and race-courses made near several towns. Blicher, the pastor mentioned in the preceding chapter, with several others was strongly opposed to this introduction of foreign blood, and wanted the native breed of Jutland horses developed. The stud at Moesgaard ceased in 1837, but was renewed in 1843 at Kolding with English half-bred stallions. This gave good results from the first crossing, but the following generations became more and more disappointing as time went on. By the Law of 1852, on Improving the Breeding of Domestic Animals, prizes by the State, which had ceased about 1840, were re-introduced.

and two studs were made, one for heavy horses and one for light horses, the first to consist of forty stallions, the latter to have thoroughbreds, stallions of the old Frederiksborg stud, and some of a white breed. But during the sixties the theory of improving the native breed by selection without crossing with foreign breeds became more generally accepted. The studs were broken up, the Jutland breed of horses was developed "within the breed" by selection, and the type became gradually more and more uniform. During the last part of the century breeding between selected individuals of the same family or strain was practised, whereby the breed was still more improved, and true breeding made more secure.

Horse breeding has never been neglected in Denmark, as the breeding of cattle was for a considerable time. The interest in good horses was always kept up in Jutland. But it is nevertheless the fact that greater attention has been paid to horse breeding during the last fifty years than ever before. The improvement in agriculture opened the way for a more liberal rearing of the young horses, sales to foreign countries generally realised good prices, and horse breeding was, therefore, a well paying business. Already in the sixties some joint-stock companies were formed by farmers for the purchase and use of superior stallions, such as the individual farmer could not afford; but later on the example of the bull clubs was followed, and Horse Breeding Societies were formed on similar co-operative lines to the Bull Clubs, materially assisted by the State grants under the above-named Laws on Domestic Animals. By the Law of 1893, £2220 were set aside for these Societies. It was stipulated in the Law that the members' mares should be approved, that the stallion should be the property of the society, or, if hired, placed at its exclusive service for a number of years. The grant was distributed between the societies according to the value of the stallions, up to one-sixteenth of the value of the stallion being allowed a society every year, to an amount not exceeding £28. The Law of 1902 increased the amount placed at the disposal of the Horse-Breeding Societies. The grant per stallion could be up to one-half of the purchase price of the stallion, but was not to exceed £220; it was to be paid in five equal instalments

spread over five years. If the stallion was hired the grant could be one-half of the annual hire, up to an amount not exceeding £22 a year, and could not be paid for more than five years for the same stallion. The Societies were bound to let each stallion for which a grant was given cover up to ten mares from outside the societies. The mares were to be selected by the Live Stock Commissioners on horse breeding, appointed by the State or by the advisers on horse breeding appointed by the Federated Agricultural Societies for the province, the service fee to be the same as that paid by members of the Society. By the Law of 1912, which materially reduced the State grants in view of the good results then attained, the grant for a stallion was reduced to one-quarter of the purchase price, *i.e.* reduced by one-half, the same reduction as for bulls. It was not to exceed £110, to be paid in equal instalments annually for four years. The Societies are made subject to inspection under the Minister of Agriculture, by whom the rules must be approved. There must be at least twenty members, whose mares must be inspected and the brood mares approved at least every three years. The stallion must be the property of the Society, and must take a prize at a State show during the year for which the grant is desired, or else must, during that or a previous year, have been awarded at least a third-class prize for good progeny. The grant is only given as long as the stallion is able to breed, and not suffering from defects that could be transmitted to the offspring. The Law further stipulates, that "the Society shall be bound to let the stallions, for which grants are given by the State, cover annually for four years up to eight mares selected by the Live Stock Commissioner, at a rate of double the fees for service paid by the members of the Society. This obligation shall apply to all the stallions, of the age of four years or older, owned by the society, if they have taken prizes at a State show or a provincial show, whether these stallions obtain a State grant or not. The Society can free itself from this obligation only by refunding all the money received by it as grants from the State."

The first Horse Breeding Society was formed as early as 1879 in Bornholm. It bought stallions of the Frederiksborg breed, the mares were selected by a committee. The Society

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is still in existence. Another society was formed in 1886 in South Sealand for breeding carriage and riding horses. But these Societies, although exercising a healthy influence in their separate districts, had no effect outside them. It was from Jutland that the impulse came which spread over the whole country and brought about the modern development in Danish horse breeding. The Federation of Jutland Agricultural Societies, at its annual meeting in 1886, empowered its committee on animal industry to take in hand the formation of Horse Breeding Societies. The committee delegated two of its members, a landowner named Mourier-Petersen, with great knowledge of and interest in the Jutland horse, and its adviser in horse-breeding, J. Jensen, who two years afterwards was appointed by the State as Live Stock Commissioner on Horse Breeding, to draw up a set of bye-laws for such societies. These two men did not agree on the kind of society to be aimed at, inasmuch as the first wanted a large society for the whole of Jutland, while the latter, guided by the bye-laws which Friis had drawn up for the first Co-operative Bull Club in Sealand, wanted a number of small co-operative societies. The first plan was tried in 1887, but did not meet with sufficient support from the farmers. Early in the same year, at the suggestion of Jensen, a local society was formed near Aarhus for the purpose of selecting the best mares and stallions from the stock of the members, and buying mares and, if need be, stallions. There were at the time three superior stallions available in the district. Each member was to have at least one approved brood mare, these were to be served only by the approved stallions, and were not to be sold except with the consent of the committee, which should have the first offer of any promising offspring. Members were to pay an annual contribution and be severally and jointly responsible for any loan the society might raise. The idea was to form a stud by voluntary co-operation between the many small owners of good mares. The Society, called "Jyden" (whereby is meant the Jutland horse), succeeded well, and gave rise to the many Horse Breeding Societies which have since been formed all over the country.

A few months after the formation of this society came

the Law of 1887 on the Breeding of Domestic Animals, offering State grants to stallions bought by Societies. This created a considerable stir. The fact that the State in this practical way gave its official approval to these Societies made them popular among the farmers. But it also somewhat altered the aim of the Horse Breeding Societies. The Society "Jyden" had aimed at improvements in several different directions, such as buying good breeding animals, selecting the best stallions and mares owned by members, deciding which animals should be paired, and advising as to the rearing of foals and young horses. The effect of the Law was to focus attention on the one item: the purchase of a superior stallion for which a State grant could be obtained. Most of the Horse Breeding Societies became, in fact, the counterpart of the Bull Clubs, Co-operative Stallion Clubs. A number of societies, mostly larger ones, was, however, formed with all the aims of "Jyden," to which aims were added that of keeping stud-books.

In 1888 at least 14 Horse Breeding Societies were started in Jutland, and soon those of the stallion club pattern were counted in hundreds, and took a decided lead over the other societies of the "Jyden" pattern. The Stallion Clubs were mostly small, the number of members being naturally restricted to those owning a suitable number of mares to be served by the stallion of the society. Societies for breeding Jutland horses have also been formed on the islands. While in Jutland horse breeding is fairly uniform, aiming at breeding the Jutland heavy horse, different breeds are favoured by farmers on the islands, some going in for heavy horses and some for different kinds of lighter horses, carriage, riding horses or army remounts. This has made co-operation in horse breeding more difficult among farmers on the islands than among Jutland farmers. In Sealand the Frederiksborg breed is the leading one. In Funen some societies breed horses of the Oldenburg breed, horses for army use, or light draught horses; but heavy Belgian horses are also bred, and societies for these different breeds are formed on similar lines to those already described.

By the official inquiry in 1909,<sup>1</sup> referred to in several previous chapters, 270 Horse Breeding Societies were found

<sup>1</sup> See note on p. 95.

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to be in receipt of State grants. Of these 21 were formed before 1890; in the following quinquennial periods the following numbers were formed:—

1890-1894 ... ..	33 societies.	1900-1904 ... ..	59 societies.
1895-1899 ... ..	45 „	1905-1909 ... ..	112 „

Further information about State supported societies is given as follows:—

	Number of			Amount of grant by the State.
	Societies.	Members.	Stallions.	
1900 ... ..	203	16,800	254	£ 2,780
1905 ... ..	233	20,300	273	6,450
1909 ... ..	270	21,500	312	8,340
1912 ... ..	267	not stated	281	9,400
1914 ... ..	259	„	263	7,670
1916 ... ..	163	„	167	4,170

The number of farms, with horses, attached to horse-breeding societies was, both absolutely and relatively, considerably larger in Jutland than on the islands.

	Number of		In percentage of total number of	
	Holdings.	Horses.	Holdings.	Horses.
On Islands ... ..	6,483	47,051	9·5	19·9
Jutland ... ..	16,708	101,039	18·3	35·0
Denmark ... ..	23,191	148,090	14·5	27·3

Thus it appears that in 1909 less than every tenth farm on the islands, with about one-fifth of all horses, were connected with a Horse Breeding Society, while in Jutland nearly every fifth farm, with more than one-third of all horses, were so connected.

Grouping the holdings according to size (dealing here only with those in country districts), and enumerating, in each group, the holdings and the horses on these connected with Horse Breeding Societies, we find, as we might have expected, that the large farms take a comparatively greater part in the

co-operative work in horse breeding than was the case in cattle breeding, and in the co-operative agricultural industries for producing butter and bacon.

Size of holdings.	In Horse Breeding Societies were		Percentage of total number in country districts	
	Holdings.	Horses.	of Holdings.	of Horses.
Less than 1½ acre ...	68	131	1·4	1·7
From 1½ to 12 acres ...	235	468	0·9	1·4
„ 12 to 73 „ ...	9,348	39,978	11·5	18·1
„ 73 to 147 „ ...	9,478	64,152	39·6	46·0
„ 147 to 589 „ ...	3,256	33,190	47·4	54·9
Over 589 acres ...	221	6,743	38·2	42·4
Total ...	22,606	144,662	15·8	30·2

It will be noticed that, according to percentages, the numbers of horses entered in Horse Breeding Societies is in every group larger than the number of holdings, which agrees with the fact that the larger farms are more interested in this movement than the smaller ones. The competition for superior stallions has naturally raised the prices for them, and this has been done to an extent which may fairly be considered excessive, for which reason some co-operation between the Societies to keep the prices down has been advocated. Eighteen months old Jutland colts have fetched as much as £1000; full grown stallions have been sold at £1700, to which price has to be added a similar amount to be paid if, or when, the stallion is awarded certain prizes at stated shows. The service fee for non-members has been as high as £22, which in some cases may turn out to be as much as the progeny will fetch when a couple of years old, an evidently unsound business.

The Stallion Clubs or Horse Breeding Societies have been federated in various ways in the different provinces. The largest association is "The Federated Jutland Horse Breeding Societies," formed as early as 1888, comprising about 200 societies with more than 21,000 members. Each federated society pays from £1 to £2 annually to the Federation. The Live Stock Commissioner for heavy horses is *ex officio* member of the committee for selecting mares; for each district one deputy member is elected to serve on this committee for three

years. The highest authority of the Federation is the meeting of representatives, one for each federated society ; the meeting elects a managing committee consisting of the chairman and two members. The committee appoints a salaried managing chief clerk. The object of this Federation is, of course, the development of Jutland horse breeding. In Funen the societies interested in the breeding of heavy draught horses formed, in 1893, "The Federated Funen Horse Breeding Societies," comprising 33 societies with Jutland stallions, and 11 societies with Belgian stallions. The total membership of the Societies was about 2400. Each society pays about 30s. a year. There is a meeting of representatives, and a managing committee. The chairman is the representative of the Federation in "The Federation of Funen Agricultural Societies." In 1902 the societies in Sealand for breeding heavy horses formed "The Federated Sealand Horse Breeding Societies," but later on the societies breeding Belgian or mixed Belgian and Jutland horses seceded and formed "The Belgian Horse Breeders' Society in Sealand," with 10 societies (420 members) and about 140 private breeders. After that the first-named society added in 1914 the words : "for Breeding Jutland Horses," to its name. Members of this Federation are either co-operative or joint-stock horse-breeding societies or private breeders, the subscription is 2s. per brood mare. There are eight federated societies with about 600 members. A salaried chief clerk keeps the stud-books, the records of services and of the results of judging stallions and mares. A similar Federation for breeding Jutland horses was formed in 1913 for Lolland and Falster, with 19 societies and 773 members.

The societies interested in light horses have been somewhat less successful in forming associations or federations because the different individual societies had different aims, often determined by the particular stallion or stallions purchased by the societies. In 1889 an Association was formed in Frederiksborg district in Sealand with 24 societies, and one in Præstø with 8 societies. Other associations were attempted, but they came to nothing, and the one founded in Præstø did not last for many years, the individual societies preferring to be independent. Most of the Horse Breeding Societies in

Sealand favour the Frederiksborg breed of horses. In Funen the breeding of Oldenburg half-bloods has many advocates, and in 1906 a "Society for Breeding Light Horses in the Province of Funen" was formed for the purpose of buying from Oldenburg breeding animals, mostly fillies. Another society for breeding carriage and riding horses was formed in Funen in 1891. Its aim has gradually changed till it has come to resemble somewhat the above-mentioned society with which it, therefore, to some extent collaborates.

#### PIG BREEDING SOCIETIES.

In a previous chapter mention is made of the improvement of the Danish pigs in the eighties by means of crossing with pigs of the Large White Yorkshire breed. This crossing was carried on in some places with the object of gradually converting the Danish breed into pure Yorkshire by continued use of pure Yorkshire boars and sows with more and more Yorkshire blood. The quality of the bacon derived from the resulting pigs was improved so as to conform more and more to the requirements of the English market: but the pure Yorkshire pigs and the highly improved crosses were found to be rather delicate for the Danish climate and other conditions. It was further found that by crossing crossbred boars and sows at random, as was done in many cases, pigs were produced which were neither so prolific nor so robust in constitution as the Danish breed, and which, therefore, did not suit the requirement of Danish farmers. A committee appointed by the Federation of Sealand Agricultural Societies proposed, in 1893, to regulate the breeding of pigs on better lines, and the Live Stock Commissioner, Mr. Mörkeberg, was asked by the Royal Agricultural Society to make a thorough investigation of the state of pig breeding all over the country. As the result of his work he found that the best bacon pigs were produced by crossing sows of the coarser home breed with pure-bred boars of the Large White, by which means animals were obtained possessing the desirable points in a bacon pig, being at the same time prolific and hardy. In order to enable farmers in general to produce this first cross for bacon it was necessary to keep

up a supply of the two breeds, and Mørkeberg, therefore, proposed that "breeding centres" should be established where the breeds should be kept pure, some centres for Yorkshire, some for the Danish pig, where farmers could buy the required breeding animals of either breeds. This plan was adopted. In 1895 four breeding centres were formed in Sealand, and, by the support of the agricultural societies, similar centres were soon spread all over the country. This arrangement paved the way for Co-operative Pig Breeding Societies on similar lines to those for horses and cattle.

A few such societies had already been formed at an early period in imitation of the bull clubs. When the breeding centres for the Large White and the Danish pigs became generally known among farmers, they availed themselves of the opportunity offered to buy good sows of the Danish breed whenever their own stock was not good enough. To serve these sows farmers then formed societies for the joint purchase and use of a Yorkshire boar from a centre. The number of Pig Breeding Societies, therefore, increased rapidly, and the usefulness of the breeding centres was at the same time greatly enhanced. These centres and the Pig Breeding Societies worked together in a very practical manner for the production of better bacon pigs. Of Pig Breeding Societies, 27 were formed in 1899, 21 in 1900. Then the State offered its help in the shape of a grant not exceeding £550, to such societies as fulfilled the conditions laid down by the Minister. It was, for instance, stipulated that the boar of the society should be of Yorkshire breed, and that no more than 50 approved sows should be served by each boar. The Law of 1902 offered a grant of £3 for each Yorkshire boar owned by a society with approved bye-laws and recommended by the provincial Federation of Agricultural Societies. The members' sows were to be approved, the boar was to be the property of the society and had to be a prize-winner at a State-supported show in the class for Yorkshires. In 1904 the grant was made available also for societies with boars of the Danish breed, a change which led to the foundation of many more societies. By the Retrenchment Law of 1912 the grant was totally withdrawn, much to the disappointment of the pig breeders. The idea was that

the bacon factories might in their own interests, as some of them had previously done, assist the farmers to produce the right kind of bacon pig. This has also to some extent been done by the factories buying good boars to be stationed in various districts, and in several cases by the formation of pig-breeding societies.

The growth of the pig-breeding societies is known only to the time when the State-grant was withdrawn. From official inquiry,<sup>1</sup> it appears that three societies were formed before 1890, and during the next quinquennial periods the following numbers :—

1890-94	...	...	2		1900-04	...	...	87
1895-99	...	...	26		1905-09	...	...	135

There were :—

	Societies.	Members.	Boars.	State grant.
				£
1900 ... ..	66	1,230	75	220
1905 ... ..	183	3,740	180	550
1909 ... ..	260	6,430	326	890
1911 ... ..	240	6,908	310	890

Notwithstanding the great number of pigs in the country, and the interest taken by farmers of all classes in bacon production, as mentioned in a previous chapter, the pig-breeding societies did not gain the same relative importance as the corresponding societies in the branches of animal industry dealing with horses and cattle. In 1909 it was found that 6824 holdings with 94,412 pigs, out of a total of 174,928 holdings with 1,355,715 pigs, were connected with these societies, or only 3·5 per cent. of the holdings and 6·5 per cent. of the pigs. The corresponding percentages for bull clubs and horse-breeding societies were 16·9 and 24·1 for the former, and 15·8 and 30·2 for the latter. A conspicuous exception was the island of Bornholm, where 21·4 per cent. of the holdings and 46·4 per cent. of the pigs were in pig-breeding societies. And while in 1914 the total number of Danish holdings connected with pig-breeding societies had perceptibly fallen off, the

<sup>1</sup> See note on page 95.

number in Bornholm had actually increased. In other co-operative undertakings, too, connected with the animal industry the farmers of this little island in the Baltic have shown greater keenness than their compatriots in other parts of Denmark,<sup>1</sup> but in no branch has their superiority manifested itself to the same surprising extent as in their participation in Pig Breeding Societies, which has not been without influence on the quality of the bacon from Bornholm.

As was the case with the other similar co-operative societies, it is by the farmers of the middle-sized holdings that the greatest support has been given to co-operative pig breeding.

There was in 1918 only one Association of Pig Breeding Societies, viz., an association formed in Funen in 1904 to further the collaboration between Pig Breeding Societies, breeding centres, and the Co-operative Bacon Factories in Funen. It comprises 5 societies, 14 centres, and the 4 co-operative bacon factories, which latter bear most of the expenses.

There have been several Sheep Breeding Societies, some of which are still existing, and lately some Goat Breeding Societies have been formed, all on co-operative lines, but their importance does not seem to necessitate a full description of them here, particularly as they are constituted and act on precisely the same lines as the other breeding societies mentioned in this and the foregoing chapters.

Grants to Breeding Societies are now administered under the Law of 10th July, 1927, under similar conditions as before. There were in 1929 about 200 Horse B.S. with 17,000 members and 270 stallions, and they received a total grant of £1,300. There were 1,076 Cattle B.S. with 26,809 members and 1,281 bulls, and they received a total grant of £4,870. A few Breeding Societies for pigs, sheep and goats existed also in 1929, but they received no State grant.

When the State grant to Pig B.S. was withdrawn in 1912 it was thought the Societies would continue without it, but, as already stated, most of them ceased to exist, and this was partly because of the general improvement in the stock of pigs of the Danish breed, the so-called Landrace breed, which made

<sup>1</sup> This applies to their participation in co-operative dairy societies, bacon factories, and egg collecting societies, and in breeding societies for horses and cattle if measured by the number of animals.

them less necessary. But improvement in the pigs bred for bacon production was effected in other ways by a co-operation between the Agricultural Societies, the Co-operative Bacon Factories and the Government Live Stock Commissioner. This improvement consisted in the formation of "Breeding Centres," described on page 68. The District Committees there mentioned now consist of a Chairman, who is still appointed by the Minister, and two members elected by the Co-operative Bacon Factories in the district, while the assistant for the district to the Live Stock Commissioner acts as secretary. There are now nine districts in each of which there are one or more Local Committees of three members, two elected by the Co-operative Bacon Factories, the third being the assistant of the Government Live Stock Commissioner. These Local Committees assist the breeders who wish to obtain recognition, and superintend the Breeding Centres in their locality.

In 1922 the Breeding Centres supplied 28 per cent. of all the breeding boars in the country.

In order to compare the Large White and the Landrace breeds as bacon producers, and to compare the different strains of each breed within the Breeding Centres, five Experimental Feeding Stations have been established where young pigs from the Breeding Centres (four from each sow) are fed under control until fit for the Bacon Factory. They are then killed, judged by carefully measuring and weighing the various parts, and also judged as to quality of the bacon. Each of these Experimental Stations are under the supervision of a Committee, to which the Union of Co-operative Bacon Factories elects two members, while one member is elected by the Government Experimental Station in Copenhagen where all the material from the judgings is collected and tabulated and Reports published.

The Government having abolished the office of Live Stock Commissioner, the Union of Co-operative Bacon Factories have appointed a Leading Expert in Pig Breeding with nine assisting experts for the nine districts. These carry out the work as it was done before.

There were in 1930 27 Breeding Centres for Large White Yorkshire and 181 for Landrace, with a total State grant of £1,100.



## CONTROL SOCIETIES

OF all the co-operative undertakings initiated and developed by Danish farmers in connection with the animal industry none equal in ingenuity and in economic value the "Control" Societies. Like many other similar enterprises they had forerunners; the need for them was felt before the means of carrying them out were available. As soon as the time was ripe they developed a vigorous growth. Like the Co-operative Dairy Societies, they originated in their fully developed form, in the south of Jutland; they took their rise in the private initiative of men of the peasant class, and it is owing to the public spirit of these men and their inborn desire to impart useful knowledge to their fellowmen that they spread in a short time over the whole country.

When the interest in cattle-breeding was revived during the last century, dairy cattle were judged by exterior, by such points as a harmonious build, fine horns, pure colour, and the various points indicating a good yield of milk. But few farmers knew whether fat or lean kine filled their byres, or which of their cows gave an economic return in milk and butter for the fodder consumed. The Cattle Breeding Societies brought some improvement by drawing attention to the importance of selecting good breeding animals, so far as the knowledge of their good qualities went. But when hard times came in the eighties and nineties the necessity was felt of more precise knowledge of the yield of individual animals in relation to their consumption of food in order to decide which animal yielded a profit, and therefore should be preserved and bred from, and which should be fattened off and sold.

Attempts to judge dairy cattle according to their yield of

milk had been made much earlier by a few enterprising land-owners. Count F. A. Holstein, -Holsteinborg, in 1838-35, offered prizes for the dairy herd in his district which should yield the richest milk, and in 1846 Count F. M. Knuth, Knuthenborg, did the same for his district; but in neither case was any applicant forthcoming to compete for the prize. About the same time Count Reventlow, Aalstrup, published the information that he renewed his herd of dairy cattle by means of calves taken from those cows which yielded not only the most milk, but also the most butter, and that he had found that while one pound of butter could be produced from 36 lbs. of milk from one cow, 52 lbs. of milk from another cow were required. That, of course, was in the good old times when milk was hand-skimmed from shallow pans. The Maribo Amt Economical Society in 1847 offered prizes of £6 and £3 for the lots of cows, exhibited at the Society's show, which on a two days' test yielded the most and the richest milk; and E. Tesdorpf, a landowner of Orupgaard, at a meeting of the Society, held in the same year, explained the importance of frequently weighing the milk yielded by each cow, and he produced a form for tabulating the results of such weighings. Observations of the yield of milk by quantity was gradually introduced on many farms, but means were wanting whereby to test the richness of the milk. A farmer named Jacobsen, in 1873, constructed a small churn for churning samples of milk from individual cows, but it did not come into general use as it was too difficult to work. In the eighties, N. J. Fjord constructed an apparatus, to be used in connection with the Burmeister and Wain centrifugal cream separator, by means of which the yield of fat (or more correctly of concentrated cream) of many samples of milk could be tested at the same time and in a few minutes. The purpose of this "control apparatus" was to find, at the dairies, how the milk from the different farms varied in richness, in order that the milk might be paid for according to its content of butter fat. As the dairies produced butter and returned the skim milk to the farmers, it was only fair that those farmers supplying the richest milk should be paid a higher price. To enable the dairies to do that a method (calculation by difference) was elaborated by

Fjord, and published in 1887.<sup>1</sup> Fjord also arranged for a course of instruction in the use of the "control apparatus," principally for the managers of dairies at which it was intended to pay for the milk according to its quality. In 1886 eight dairies adopted the system of payment according to quality, and many followed during the next years.

This development brought home to many farmers how much the milk of various herds differed in quality. How much more, then, might the milk of individual cows differ! Farmers in different districts had samples of milk from their cows tested at their co-operative dairy, and several dairy managers undertook for a time such testing, in connection with which an attempt was made to keep a record of the food consumed by the same cows. Only at one dairy, viz. the co-operative dairy at Kildebrönd, was this carried on with complete success. The dairy adviser of the Royal Agricultural Society, B. Böggild, now Professor of Dairy Science at the Royal Agricultural College, Copenhagen, came in July, 1892, on the invitation of the dairy manager, Lars Hansen, to Kildebrönd and read a paper on milk testing, in which he described how the milk of individual cows should be tested by the "control apparatus," how the results were to be tabulated, and how the selection of breeding cows should be made according to the test. The same day some of the farmers formed a "Control" Society.<sup>2</sup> The following year they jointly bought a bull, and the society became the Kildebrönd Cattle Breeding Society. Lars Hansen undertook not only to test the milk of the single cows by the "control apparatus," but he also kept all the records and collected information as to the feeding of the cows. In 1894 he published the first full annual account of the individual cows of 14 co-operators, stating the quantity of milk and butter yielded by each cow, with an account of food consumed by each cow.

<sup>1</sup> Ninth Report from "Forsøgslaboratoriet," 1887. See also Sixth Report, 1885.

<sup>2</sup> The Danish "Control" Societies owe their name to the use of the "control apparatus" for ascertaining the *quality*, i.e. the contents of butter-fat in the milk. As the Milk Recording Societies or Milk Recording Associations in this country mostly confine their attention to the recording of the *quantity* of the milk yielded, it has been deemed advisable to retain the Danish name of "Control" Society, which has been adopted in several countries, and also used in various British reports on Danish agriculture.

This and the following annual accounts gave in hard figures indisputable proof of the great difference in the economic value of different cows, as some yielded a considerable profit while others consumed in value much more than they returned in milk and butter. A few farmers in other parts of the country also had the milk of their cows tested. The principle of judging cows by yield and food consumption was introduced in connection with a competition between entire herds of dairy cattle, begun on the 1st October, 1894, and carried on during two whole years by "The Patriotic Society of Funen." Through the influence of Hempel-Syberg, Gjelskov, the energetic chairman of the Funen Committee on cattle breeding, the following conditions were embodied in the rules for this competition: that the milk yield of every cow in the competing herds should be weighed every month, and the percentage of fat estimated, that the amount of fodder should be controlled and complete records kept by a salaried assistant engaged for the purpose. This was the first introduction of the itinerant "milk controller."

Although, as described, the Kildebrönd control society was the first of its kind in Denmark and in the world, it did not give the impulse to the "Control" Societies on co-operative lines which soon afterwards sprang up all over the country. It was a pioneer and deserves all credit as such, but it was just a couple of years too early in the field. The fully matured plan, which gave the impulse, took shape at Vejen, near Askov, and if one man must be named as the father of the movement he is Niels Pedersen, the managing owner of Ladelund Agricultural School, mentioned in a previous chapter, who spoke the prophetic words about the co-operative dairy movement, describing it as "a wave from the sea in the West." Some inventions made in other countries materially helped to prepare the way. One obstacle to the development of the system of milk-testing had been the necessity of having the testing done at the dairies, as the "control apparatus" had to be worked in connection with a steam-driven cream separator. And at the dairies there was, indeed, little time to spare for this extra work. In 1891, Dr. Gerber, in Zürich, published a method for estimating the amount of fat in milk, and described an apparatus

both easy to carry about and practical in working. At about the same time Professor Babcock, of Madison, Wisconsin, and the Swedish engineer Lindström, described similar inventions. All three apparatus were tested during the winter 1893-94 at the Laboratory for Agricultural Research in Copenhagen,<sup>1</sup> all were found efficient and good, Gerber's giving the most correct results and being at the same time the easiest to work. "Gerberising" milk could be done cheaply on the farm, dealing with many samples in a short time, the apparatus could be bought at a moderate cost and carried about from farm to farm. This gave the opportunity for the Co-operative Control Societies.

Niels Pedersen, Ladelund, had already since 1890 been testing the quantity and quality of the milk from each cow in his herd, and every year he published detailed reports; he agitated among farmers in the district to induce them to do the same, and with considerable success. But it was found that farmers could not in the long run find time to carry on the work and the necessary book-keeping. If the work was to prosper it had to be done on co-operative lines. A meeting was called for the 24th January, 1895, at which 13 farmers with 300 cows formed "The Control Society of Vejen and District," with Niels Pedersen as a member of the committee. A "control assistant" was appointed who, for a very modest salary, undertook to do the testing and keep the records, visiting the members' farms in rotation with the Gerber apparatus. The members were jointly and severally responsible for the liabilities of the Society; they paid a certain small entrance fee for each of their cows that they wanted to be tested, and the annual expenses were divided among them according to the number of the cows they had entered, or on a similar co-operative basis. They undertook to give the assistant free access to weigh and test the milk, to weigh the fodder consumed, and to give him the necessary information required for the book-keeping. This latter was fairly simple during the first years, but gradually became more complicated as more and more questions were taken up in connection with the economics of dairy farming and the breeding of good cattle, based on a

<sup>1</sup> Thirty-first Report from "Forsøgslaboratoriet," 1895.

full knowledge of the yield of the individual cows. In 1897 a movable cattle-weighing machine was added to the equipment. In 1898 an annual report was issued showing, besides the yield of milk of each cow by quantity and quality, a detailed account of foodstuffs consumed, by weight and by "food-units," the increase in weight of each cow, the young stock, and the production of bacon pigs. In later years an account of the stock of foodstuffs was added, showing in- and outgoings, an account of the horses, and a debit and credit account of the cattle and pigs. "Gradually, as farmers learnt to understand and appreciate the reports, new branches of the business were taken up in the case of members who desired it."

The object of estimating the quality of the milk was a double one, gradually to eliminate those cows which were unprofitable, and to breed from the best "butter-cows." By these means the yield and thereby the economic value of the herds should be improved. How far this object has been attained is shown by the following annual averages extracted from the records of the 13 herds belonging to the original members of the "Vejen and District Control Society" or their successors:—

	Number of cows.	Lbs. of milk per cow.	Per cent. of fat.	Lbs. of butter per cow.	Food-unit per cow.
1895-1900 ... ..	307	6789	3.35	253	4307
1900-1905 ... ..	332	7081	3.44	271	4473
1905-1910 ... ..	333	6988	3.53	274	4676
1910-1915 ... ..	330	7473	3.55	295	4827

When this Control Society had been working for one year, some of the information gathered was published in a form which created a considerable sensation in farming circles.<sup>1</sup> It was stated that the cost of producing one pound of butter varied from ninepence to elevenpence when comparing the herds, all being equally well tended and well fed. But comparing the single cows a much greater difference was found. While the best cow produced a pound of butter at the cost of sixpence, the poorest cow produced a pound at the cost of 2s. 8d. ! A

<sup>1</sup> Report by Jens Johansen, a teacher at Ladelund Agricultural School.

ruinous business if ever there was one! Two cows stood side by side in a byre. Their yield of milk for a year had been 7810 lbs. and 8226 lbs. The latter cow would be considered the better, if quantity of milk alone was to guide the farmer. But the first cow gave milk with 4.26 per cent. of fat, the other cow milk with only 2.93 per cent., or the first cow had during the year produced 110 lbs. of butter more than the other. These were hard facts which farmers could understand.

During the following years Control Societies were formed at various places. Realising the economical importance of this co-operative movement the State tried to foster it. Under the Law on the Breeding of Domestic Animals, £550 available for "other measures" to improve the breeding were devoted to these societies. This was soon found to be a considerable encouragement. As the Control Societies grew in number the need for mutual aid was more and more felt. Meetings were held by delegates from the various Control Societies to draw up uniform rules for keeping books and carrying on the work in general; a collaboration between Control Societies and Cattle Breeding Societies was initiated in order to utilise the information collected by the former when selecting breeding animals for the latter; information as to the yield of milk and butter was entered in the herd books; and Federations of Control Societies were formed which called annual meetings for the discussion of the work. The State grant, which had gradually been increased to £2200, appeared as a special item in the Law of 1902. This Law fixed the grant to each society as not above £14, the total not to exceed £6700, and made it a condition for the grant, that "the society should have for its aim to make dairy farming more profitable by examining into the feeding of the individual cows and their yield of milk by quantity and quality and to help to produce strains of dairy cattle with a higher yield of butter."

Several hundred Control Societies were soon formed, but a falling off in the increase was noticed at the beginning of this century. Possibly the agitation has been carried too far; several farmers had been induced to join in the hope that the good results of the work should be theirs without much personal trouble. When they discovered that only by their participation

in the work, and their close study of the resulting reports could they derive any profit from their Society, they tired and left. But a more serious trouble was the insufficient supply of suitable young men for the position of "control assistant." As the State had done but little to help the co-operative dairy societies to get competent managers, so did it take little care to provide the necessary education for the real workers in the Control Societies, viz. the assistants, of which hundreds were soon needed. And it may be added that the farmers themselves were far from liberal in the remuneration they offered, thereby discouraging more experienced men from applying. It was the private agricultural schools which stepped in to fill up the gap. First they arranged a one-month course for these assistants, which was found to be quite insufficient for pupils without any previous knowledge of dairy matters. At a meeting in 1907, the schools agreed to require that a pupil, in order to gain admission to the special "Control Course" of one month, should first pass a three months' agricultural course at a school; and lately they have introduced more uniform and more stringent rules for testing the pupils' abilities in "Gerberising" and book-keeping. Several young women have passed the test and are acting as "control assistants." In 1917 special control courses were held at fifteen different agricultural schools; some of these have several courses at different times of the year, and at the schools with special instruction in dairying some control courses last three months.

A co-operation between Control Societies and Cattle Breeding Societies began locally. The State has encouraged this in various ways. By the Law of 1912, when most other grants from the State were reduced by one-half or quite withdrawn, the grant of not more than £6700 to the Control Societies was renewed, but the grant to each society was not to exceed £11. To obtain the grant the societies "must have at least 10 members with 200 cows; they must be affiliated to one of the federations (see below), and be recommended by the Federation of Agricultural Societies of the Province, to which each society must send an annual report, giving a complete record of all the cows by name or number, date of birth, sire and dam, yield of milk by quantity and quality (weight and percentage

of fat), amount of food consumed, date of calving, and marking of the calves and how they have been disposed of. The Provincial Federation has to summarise these reports and to publish such information derived from them as is deemed to be of importance for the furtherance of the breeding of dairy cattle." It has already been mentioned, when dealing with the cattle-breeding societies, that the Law of 1912 offered an increased grant to the bull clubs which had a certain number of their cows entered in "control" societies. Two very important provisions (in sect. 3), which came into force, the first two years after the passing of the Law, and the second three years later, tend in the same direction, viz. that "no State grant shall be given to prizes for bulls of dairy breeds at agricultural shows unless reliable information be given of the milk yield of their dams by quantity and percentages of fat," and that "no State grant shall be given to prizes for cows of dairy breeds unless reliable information be given of their milk yield by quantity and percentages of fat." At the State bull shows bulls of dairy breeds, which have not previously taken prizes at such shows, shall not take prizes unless the milk yield of their dams by quantity and percentages of fat is stated; this took effect three years after the passing of the Law. The effect, on the average yield of milk by quantity and quality, of the work done by Bull Clubs and Control Societies is described in Appendix II., No. 11.

According to the official inquiry in 1909 the State gave grants to 519 co-operative control societies. These societies were formed :—

In 1895-1899	...	...	...	...	...	...	128 societies.
In 1900-1904	...	...	...	...	...	...	207 "
In 1905-1909	...	...	...	...	...	...	184 "

The total number of societies known to exist during the last four years, nearly all receiving State grants, were :—

In 1913	...	...	...	...	...	...	592 societies.
In 1914	...	...	...	...	...	...	633 "
In 1915	...	...	...	...	...	...	666 "
In 1916	...	...	...	...	...	...	690 "

The Horse Breeding Societies and Bull Clubs found greater support among Jutland farmers than among farmers on the

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islands. The opposite was the case with the Control Societies. In 1909 there were the following numbers of herds and of cows attached to Control Societies :—

	Numbers of		In percentages of total number of	
	Herds.	Cows.	Herds.	Cows.
On the Islands ...	7,635	136,754	10·1	24·3
In Jutland ...	4,937	88,083	4·7	12·4
In Denmark ...	12,572	224,837	7·0	17·7

Every tenth island farmer with one quarter of the total number of cows on the islands had joined a Control Society, while of Jutland farmers not quite one in twenty with only one-eighth of the cows had done so. In 1914 very nearly 16,000 herds, which is about equivalent to 16,000 farmers, had joined. The growth of these Societies has been well maintained to the present day.

Most of the co-operative undertakings described in previous chapters had their main support from the peasant farmers on middle-sized farms, with the exception of horse-breeding societies, which were well supported also by the large land-owners. The Control Societies found their chief supporters, on the whole, among the owners of the largest herds. The following table deals with holdings in country districts only.

In Control Societies there were (1909) :

Size of holding.	Number of		In percentage of total number of	
	Herds.	Cows.	Herds.	Cows.
Less than $1\frac{1}{2}$ acre ... ..	5	13	0·3	0·5
$1\frac{1}{2}$ to 12 acres ... ..	579	1,796	1·1	1·4
12 to 36 „ ... ..	1,609	11,100	3·4	4·7
36 to 73 „ ... ..	3,981	47,280	11·2	14·8
73 to 147 „ ... ..	4,521	77,721	18·9	24·5
147 to 589 „ ... ..	1,445	53,937	21·1	34·4
Above 589 „ ... ..	223	29,271	38·8	46·3
	12,363	221,118	7·2	18·0

It will be noticed that the percentages increase from group to group up to the group of the largest estates.

The Control Societies, alone or in conjunction with the Bull Clubs or Cattle Breeding Societies, have formed local and provincial Associations or Federations. In Funen there is one large Association of Bull Clubs and Control Societies, the chairman of which is a member of the Committee of the Federated Funen Agricultural Societies. The Federated Sealand Control Societies are affiliated to the Federated Sealand Agricultural Societies, and their chairman is elected by the committee of the Federated Sealand Agricultural Societies. The Control Societies in Bornholm have their own association. In Lolland-Falster the Federated Agricultural Societies appoint a Committee on Cattle Breeding and Control Societies, which committee acts as joint central committee for the two kinds of societies. In Jutland there are eighteen associations each comprising all the societies of the two kinds within their district. An Agricultural Record Committee appointed by the Federation of Jutland Agricultural Societies is the chief authority of the Jutland Control Societies; this committee receives, revises and publishes the annual reports from the individual societies and convenes an annual meeting of the chairmen and assistants.

The above-named Association of Cattle Breeding and Control Societies in Funen has drafted a set of model bye-laws for the affiliated control societies. According to these members are bound for a period of three years, and must give six months' notice if they wish to withdraw at the end of the period. They are severally and jointly liable for the society's debt. Members undertake :—

(a) To have the milk of each milch-cow controlled at least once a month according to the rules of the Association ;

(b) To have the fodder weighed, and to calculate it by food-units according to the rules of the Association ;

(c) To have the cows branded with a current number on the outside of the right horn ;

(d) To have the ears of the calves marked with the number of the dam ;

(e) To keep a careful record of service and calving ;

(f) To keep a record of the total milk yield.

For each cow entered an entrance fee of 1s. is charged. Annual expenses are levied on members according to the number of tests taken for fat in milk samples.

A committee is elected at the general meeting for a period of three years; each member has one vote. The committee appoints the control assistant. Members are to find him board and lodging while he works on their farm.

Control Societies had their origin in Denmark, and they are generally reckoned to date from the year 1895, although, as mentioned, one society at least was formed a few years earlier. From the society at Vejen they spread to Sweden, where "Hvilan's Control Society" was formed in 1898, and in the same year a similar society was formed in Norway. The Danish farmers in North Slesvig formed four societies in the years 1897-1900, and from these the movement spread throughout North Germany and penetrated to South Germany. In Finland societies were formed as early as in 1899, and spread into Russia, particularly the Baltic provinces and Poland. To Holland they came in 1900, to Austria and to Great Britain in 1904, to Hungary in 1910. In Michigan, U.S.A., the first control society was formed in 1905 by a Swedish control assistant. Canada, Argentine, and New Zealand, and almost every country where dairy farming is of importance, have followed the example, and have derived benefit from this kind of co-operation, which not only helps to increase the economic return of dairy farming, but lifts the work up from mere drudgery so that it becomes an interesting industry based on rational principles.<sup>1</sup>

Control societies have spread to many countries. In many of these they have joined to form associations. There has even been to some extent international co-operation between associations of control societies in different countries. A very important branch of the work of the societies is to measure the amount of food consumed and to regulate the feeding of the individual cows according to their yield of milk and fat. In order to do that it is necessary to reduce the value of the

<sup>1</sup> For information about the improvement in the yield of milk of Danish dairy cattle, largely due to the control societies, see Appendix II., No. 11.

different kinds of food to a common unit. If one pound of corn be taken as the unit, then one food unit of another kind of food would be so much of the food as would replace one pound of corn in the fodder of a cow without affecting the yield of milk or the weight of the cow. If one pound of palm kernel cake, for instance, has the same feeding value as one pound of corn, then one pound of palm kernel cake is equivalent to one food unit. If turnips contain 8 per cent. of solid matter, and if one pound of this has the same feeding value as one pound of corn, then  $12\frac{1}{2}$  lbs. of turnips make up one food unit, and so on. At a meeting of a joint committee, appointed by the Danish Provincial Associations of Control Societies, with representatives of Norwegian and Swedish control societies, held in the autumn of 1915, an agreement was arrived at by which the same Food Unit and the same method of calculation have been accepted by all Scandinavian control societies. The meeting agreed on the following four points :—

1. The Food Unit is to be one kilogram of barley.
2. Equivalent figures for the various kinds of "concentrates" (foods such as corn, mill offals and oilcakes) to be fixed according to results of feeding experiments.
3. The relative value (number of food units) of roots to be calculated from their percentage of "total solids" ascertained by analysis.
4. Food units of grass to be calculated from the yield of milk and the weight of the cows; all feeding stuffs given in addition to the grass to be deducted at their full value (number of food units).

In agreement herewith the Danish Control Societies have drawn up the following scale. One food unit shall be one kilogram of barley, and the following quantities of foodstuffs shall be considered equivalent to one food unit :—

#### A. "CONCENTRATES."

- 1 kg.<sup>1</sup> of wheat, rye, maize, peas, vetches or beans.  
 0·8 kg. of the best kind of decorticated cotton-seed cake, ground nut cake, sesame cake, soya bean cake or soya bean meal.

<sup>1</sup> Kg. = kilogram = 2·2 lbs.

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- 0·9 kg. of ordinary cotton-seed cake, sunflower-seed cake, rape-seed cake, linseed cake or maize gluten feed.
- 1·0 kg. of cocoa-nut cake, palm kernel cake, hempseed cake.
- 1·1 kg. of oats and barley mixed.
- 1·2 kg. of oats, bran, malt culms, molasse feed, undecorticated cotton-seed cake or sunflower-seed cake.

### B.

- 1 kg. solids in roots (if no analysis of total solids in the roots in stock has been made, the average analysis for the year published by the Root Commissioner is to be used). [The following quantities of roots were formerly taken to contain 1 kg. solids, or one food unit :
  - 10 kg. mangolds, carrots, or swedes, 12½ kg. turnips, 4 kg. potatoes.]
- 2½ kg. hay (2 to 3 kg. according to quality).
- 5 kg. straw (4 to 6 kg.).
- 7-9 kg. green crop (lucerne 7, oats and vetches 10, leaves of roots 15).

Grass is calculated as follows :

Grass consumed by a dry cow of 450 kg. weight (about 9 cwts.) is estimated at 4½ food units per day on grass ; for a smaller cow 4 food units. For a milch cow an addition is to be made according to quantity of milk produced, such as—

For	2 kg. milk	½ f.u.
„	4 „	1 „
„	12 „	3 „
„	15 „	3½ „
„	25 „	4½ „

In 1929 there were 1,336 Control Societies with 41,759 members and 545,833 cows, which means that more than 35 per cent. of all cows were being tested for yield and food consumption. The total grant was about £6,000.

**PARTICIPATION IN SOME CO-OPERATIVE ACTIVITIES**  
**ACCORDING TO THE SIZE OF HOLDINGS, 16TH JULY, 1923**

By an inquiry in 1923 it was ascertained to what extent the agricultural holdings, of the various groups according to size, took part in co-operative activities. In the following table the holdings are grouped according to area in hectares (one hectare equals 2·47 acre). The figures in the table are percentages, and for each co-operative activity the first column shows the percentages of the total number of holdings in the group belonging to a co-operative dairy, bacon factory and so on, while the second column shows the percentage of the total number of cows, pigs, &c., in the particular co-operative undertaking :—

Size of Holdings.	Co-op. Dairies.		Bacon Factories.		Egg Collecting.		Control Society.	
	Holdings.	Cows.	Holdings.	Pigs.	Holdings.	Fowls.	Holdings.	Cows.
0·55–1·7 ha.	83·5	83·1	38·7	45·6	18·6	22·6	1·7	2·4
1·7–3·3 ha.	88·6	89·3	58·7	64·0	24·4	28·6	2·8	3·9
3·3–5 ha.	89·9	90·4	65·7	70·5	21·9	25·3	3·9	5·0
5–10 ha.	89·3	89·7	71·5	76·3	21·1	26·2	5·6	7·1
10–15 ha.	91·0	91·6	72·1	76·5	20·0	24·3	9·7	12·4
15–30 ha.	91·2	91·1	74·8	79·2	21·3	25·9	19·6	24·5
30–60 ha.	90·2	89·5	74·6	77·8	23·1	27·2	32·3	39·2
60–120 ha.	82·4	80·8	67·8	68·7	19·1	22·3	43·8	51·7
120–240 ha.	60·0	48·9	57·0	56·5	15·9	17·1	50·6	56·8
240 ha. and above	33·3	29·9	40·6	55·9	16·7	25·5	56·9	57·7
Total ...	89·5	86·2	69·4	75·4	21·5	25·9	12·9	26·6

Of all agricultural holdings with herds of cattle almost 90 per cent. were attached to a co-operative dairy, and 86 per cent. of all cows in the country were so attached. The largest holdings took relatively smaller part in the co-operative dairies, partly because many of these sold milk to the towns. The participation in co-operative bacon factories was somewhat smaller, owing to the fact that the private bacon factories are relatively of greater importance than the private dairies, but,

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as appears from the table, more of the large holdings are attached to co-operative bacon factories than to co-operative dairies. Egg collecting societies or branches are more uniformly supported by holdings of all sizes, but only about one quarter of all fowls are attached to such. The control societies are chiefly of use for the large herds, more than half of the holdings in the last three groups belonging to these ; while very few of the small holdings take part, chiefly because the owners know their cows so well.

## CO-OPERATIVE SOCIETIES FOR PURCHASE AND SALE

THE development of agriculture after the middle of last century increased the need among farmers of many articles for house and home, for field and stable, which they had formerly done without or produced themselves. Implements, machinery, seed, artificial manures, feeding-stuffs, and many other things gradually became necessities. First came improved and lighter implements for hand-working, then reaping machines, improved ploughs, double ploughs, improved harrows and rollers, cream separators and other machinery for field, farm and dairy. Better grass seed was wanted, and grass seed and clover seed were bought from other countries. As late as in the sixties bones were exported from Denmark to be manufactured into manure; but ten years later the import into Denmark of chemical manures and raw materials for their manufacture increased rapidly. In the year 1867-68 more than 2000 tons of oilcakes were exported from Danish oil-mills, and it was not unheard-of for oil cakes to be used as fuel. Ten years later there was a considerable import of oilcakes and other feeding-stuffs, and this import increased with the increase of stock and better feeding.

This development affected other classes than farmers; it made new demands on merchants. During the years of corn-growing for export merchants had acquired a knowledge of corn and the corn trade; but they were now asked to supply feeding-stuffs, machinery, manures, and seed, and their knowledge of these goods was often deficient, with the result that they were defrauded when they bought from abroad. Want of knowledge or honesty or both, on the part of the merchants, combined with want of knowledge on the part of the farmers,

often resulted in very severe losses for the latter. If useless or inferior artificial manure, or impure and badly germinating seed are used on a field the disastrous results do not appear until it is too late to remedy them, and the loss caused is often many times greater than the total value of the seed or manure in question. The individual farmer is in most cases unable to guard himself against fraud, as the chemical composition, purity, germination or other character of the goods can only be determined by analysis or examination by an expert. Merchants with a somewhat elastic conscience were, therefore, sometimes tempted to sell goods of inferior quality, such as seed of very low germination or mixed with seed of weeds, or chemical manure with very low percentage of the active substance, at prices which would have been low if the goods had been of fine quality, but which, as they were, left an undue profit to the merchants. As the demand for these goods increased with the increasing production, so did the importance of getting good value for the growing expenditure. The necessary cost of distribution fell heaviest on the small parcels, and made these goods relatively more expensive to the small farmers who were least able to pay. These, therefore, in many cases became indebted to the merchant, and consequently were obliged to buy from him at prices which were not always the lowest.

There were many cases of systematic fraud. From a quarry near Prague in Bohemia, stone powders were produced by sifting, resembling the various kinds of clover seed in colour and size of grain. They were used for mixing with clover seed which has been known to contain as much as 90 per cent. by weight of what became notorious in the seed trade as the "Bohemian mountains." Other adulterations were carried on by English firms, such as the admixture of dead seed or seed of low power of germination, "to counteract the unfortunate inclination of farmers to sow too closely." Bran from abroad was found adulterated with mill-dust, chaff, seed of weeds and cleanings from corn. Chemical manures were offered under fancy names and were sometimes found to have a value of only one-twentieth of the sale price. Of course, the legitimate trade did not deal in these goods, but even the better firms

had difficulties in controlling the goods supplied by manufacturers or merchants abroad.

Similar conditions in the trade in these commodities were found in England and Germany, and England was the first country in which societies were formed for the joint purchase of seed, manures, feeding-stuffs and also machinery and implements in order not only to buy cheaper but to secure a guarantee of the quality and other characters required in the purchased articles. These societies, formed in England and Scotland during the seventies, were somewhat on the lines of the co-operative supply societies. The oldest society of this kind in England, and probably the oldest in the world, is the Agricultural and Horticultural Association, formed in 1867, and managed by Mr. Edward Owen Greening, whose name is so well known in co-operative circles in England, and, indeed, in all countries. In Germany the Raiffeisen banks worked partly with the same aim, and through these banks the movement spread to several other countries.

Denmark was rather late in the field, so far as the application of co-operative principles to joint purchase is concerned. This may to some extent be due to the fact that co-operative supply societies and co-operative dairy societies began fairly early to purchase seed, manures and feeding-stuffs for farmers in their districts, but not in a co-operative way and without forming separate societies for the purchase. In 1869 and 1870 four fairly large societies for the purchase of manures were formed, and during the following years a good many similar societies for the purchase of manures, seed, feeding-stuffs, and a few other articles. But most of these were small and of only local importance, and taken all together they supplied only a small fraction of the requirements of farmers. Joint purchase and distribution on co-operative lines were started at the end of the eighties by the Co-operative Wholesale Society in Copenhagen, and in 1885 by the society in the Ringkøbing district, as mentioned on page 30.

What roused Danish farmers to have recourse to co-operation in the supply of these commodities was an act on the part of the trade which was interpreted as an attempt to form a trust for the purpose of making farmers pay higher prices. In

order to defeat this attempt, and at the same time to secure greater guarantee of getting just the kind of goods required, farmers joined in the way in which they had previously succeeded, and in which they have on several later occasions successfully counteracted the formation of trusts. Indeed, it has become more and more clear that in co-operation is to be found the only effective and legally unexceptionable means against the modern trusts.

In the middle of the nineties, merchants in Jutland formed the Jutland Corn and Feeding-stuffs Company at Aarhus. As a counter-move a large co-operative society for the whole of Jutland for the purchase of feeding-stuffs was suggested by a farmer named P. Bjerre, a member of the Rigsdag. The idea was taken up, many meetings were held, and a committee was appointed with Anders Nielsen, Svejstrup Østergaard, as chairman. Notwithstanding many warnings in the local papers, pointing out that such an undertaking was much more difficult than making butter or bacon by co-operative societies, that it required experienced merchants to buy and sell, and that a very much larger working capital was required in such a trading concern than in local producing societies, the committee forged ahead, and in 1898 the "Jutland Co-operative Society for the Purchase of Feeding-stuffs" was formed, with its seat at Aarhus, with Anders Nielsen as chairman, and an energetic young merchant, Chr. Nielsen, as managing director. It started with 68 local branches or societies, and had for the first year a turn-over of £61,000, which by the year 1915-16 had increased to £3,716,000. The society had in 1916, 830 local branches <sup>1</sup> with about 40,000 individual members, and branch offices in seven other towns in Jutland. Co-operative dairy societies, or groups of farmers among the members of such societies, or special societies of farmers formed for the purpose are accepted as members of the J.C.S.P.F., provided that they bind themselves for a period of five years to purchase their feeding-stuffs through the society. Each such member signs a guarantee in proportion to the number of cows owned by the farmers. This guarantee amounts to about £28 for each 250 cows. The local societies are represented at the General

<sup>1</sup> In 1917 increased to 848.

Meeting by one delegate for each 100 farmers. The General Meeting elects a Committee of representatives of 85 members. This Committee appoints a managing director and a treasurer and elects a Board of Directors consisting of chairman, vice-chairman, secretary, and two other members. Members of local societies are jointly and severally liable for the prompt payment for goods supplied. The annual surplus is divided among members in proportion to the value of feeding-stuffs purchased by them after deducting 25 per cent. of the surplus, which is paid into a sinking fund.

A similar society for the islands, called "The Islands' Co-operative Society for the Purchase of Feeding-stuffs," was formed in 1901 with its seat in Copenhagen. The turnover during the first year was £78,000, besides a smaller amount for purchased artificial manures. During the year 1915-16, 90,000 tons of feeding-stuffs to the value of £1,050,000, and 4700 tons of manures to the value of £38,000 were supplied to members. The "members" are local societies which are bound for a period of five years and sign a guarantee. Each member, *i.e.* farmer, in a local society is bound to purchase all his feeding-stuffs, up to the amount of 6 cwts. per cow, through the local society, and local societies are bound to make all their purchases through the central society. The general constitution of the society is like that of the Jutland society. The same year a "Funen Co-operative Feeding-stuffs Company" was formed on similar lines, at Svendborg, which in 1915-16 supplied 40,200 tons of feeding-stuffs to the value of £444,000, and a "Lolland Co-operative Dairy Societies' and other Co-operators' Joint Purchase Society," with a turnover in 1915-16 of £94,000. The latter society also supplies coal, seed, and a few other commodities.

These four societies for the supply of feeding-stuffs, together with the Ringkøbing district society, had, for the year ending March, 1916, a total of 1230 local branches or societies, with 68,000 individual members, representing 463,000 cows, and a turnover of £5,562,000. The surplus which in 1914-15 had been  $7\frac{1}{2}$  per cent. of the value of the goods supplied, was in the year 1915-16 reduced to 4.8 per cent.

Two more co-operative purchase societies were formed in

1901, the same year as the above four. "The Danish Co-operative Dairy Societies' Joint Purchase Society and Engineering Works" in Copenhagen and Kolding supplies machinery, implements, and other requisites to co-operative dairies. Owners of private dairies and co-operative bacon factories can also become members. Members sign a guarantee, the surplus is divided among members in proportion to the amount of their purchases. Members are not bound to make their purchases through the society. In 1916 the number of members was 1050, and the turnover was £124,000. The other society, the "Danish Co-operative Manure Supply Society," began as a federation of 21 co-operative societies supplying manures, and was originally intended to assist these and co-ordinate their activities, but gradually the local societies became members of the central society, which carried on the joint purchasing, and the number of such members increased to 800, nearly all of which bound their individual members to purchase all their manures through the society. The annual turnover of the central society had in 1916 reached the amount of £305,000.

The use of artificial manures has increased very rapidly of late. The value of the import, free in Danish ports, was in 1900, £204,000; in 1905, £333,000; in 1910, £561,000; and in 1914, £1,244,000. A joint stock company, the Danish Manure Supply Company, had gradually monopolised the trade. In 1915 this company notified its customers that if they wished to be supplied at all in the future, they would be required to bind themselves for a period of five or ten years to buy their whole requirements of all sorts of artificial manures from the company. This caused a great and widespread indignation in farming circles throughout the country, and Danish farmers, large and small, felt that another occasion had arisen for meeting a threatening trust by applying the co-operative antidote. The man who voiced the feelings of his fellow farmers was also this time Anders Nielsen, Svejstrup Østergaard, chairman of the Central Co-operative Committee, of the Jutland Co-operative Society for the Purchase of Feeding-stuffs and of the Danish Co-operative Manure Supply Society. He called, in December, 1915, and January, 1916, two meetings of

representatives of agricultural societies and co-operative manure supply societies, to discuss what action should be taken, and in July, 1916, a meeting was convened in Odense, where 871 delegates of farmers' organisations from one end of the country to the other met and unanimously and vociferously carried a resolution to form the "Danish Co-operative Manure Supply Society of 1916," passed the bye-laws and elected a committee of representatives. This committee elected a board of directors with Anders Nielsen as its chairman. At the meeting it was announced that a total of 1353 local societies with 67,600 individual members had joined the "D.C.M.S.S. of 1916," representing farms of a collective rateable value of £53,000,000 corresponding to a guarantee fund for the society of £900,000. On account of the abnormal and difficult circumstances caused by the world war the society was unable to start operations, as intended, in 1917.

The members are local societies, which must have at least ten co-operators and be open to others to join. The local society must send to the central society (1) an agreement signed personally by each of the individual members, binding them for a period of ten years to buy through the society all the artificial manure used on their farms; (2) an agreement signed on behalf of the local society by the members of the board of directors of the local society making these jointly and severally liable for a guarantee fund corresponding to one-half per cent. of the total rateable value of the farms belonging to the inscribed co-operators, provided that no co-operator shall be liable beyond an amount of four shillings per acre. The liability of members must be limited to this guarantee fund and the debt of the local society for goods delivered. Each member, *i.e.* local society, must be represented at the general meeting by one delegate. The general meeting elects a committee of 23 representatives, who elect their own chairman, vice-chairman, and secretary. The committee of representatives also elects a board of directors, chairman and vice-chairman, secretary and four other members, and appoints the mercantile and technical managers. Within each local society the members, *i.e.* the farmers, manage the affairs of the society; they are jointly and severally responsible for prompt payment of goods

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delivered, and share in the surplus in proportion to their individual purchases.

In 1913 a "Danish Co-operative Coal Supply" was formed to supply coal and other fuel to co-operative dairy societies, bacon factories, supply societies, and to other societies for joint purchase of coal. Its turnover in 1914-15 was about £55,000.

Besides the co-operative societies for the sale of agricultural produce such as butter, bacon and eggs, dealt with in previous chapters, a few societies for the sale of other produce such as potatoes, hay, and straw have been formed during the last few years; but only those undertaking the sale and export of cattle are of any importance, and even these have had only a very moderate support.

### IMPORT INTO DENMARK, IN TONS.

	Feeding Stuffs.			Artificial Manure.	
	Maize.	Bran.	Oilcake.		
1881-85 ...	41,000	52,000	27,000	1881-90 ...	17,700
1891-95 ...	69,000	93,000	80,000	1891-1900 ...	47,100
1901-05 ...	268,000	56,000	322,000	1901-10 ...	98,300
1911-15 ...	398,000	47,000	537,000	1911-20 ...	222,900
1921-25 ...	421,000	62,000	560,000	1921-25 ...	378,300
1928 ...	653,000	102,000	745,000	1928 ...	497,800

### FIVE CO-OPERATIVE SOCIETIES FOR THE PURCHASE OF FEEDING STUFFS.

	Number of Members.	Number of Cows.	Turnover.		Percentage of Total Supply.
			Tons.	£	
1919-23	75,100	491,200	266,100	4,100,000	1921-25 ... 41%
1926 ...	74,100	453,750	565,500	6,300,000	1926-27 ... 39%
1928 ...	73,014	462,421	773,400	7,900,000	1927-28 ... 54%

"D.C.M.S.S. of 1916" in 1928 had a turnover of 190,000 tons of artificial manure to a value of £1,000,000, being 33 per cent. of the total quantity used in the country.

## DANISH AGRICULTURAL SOCIETIES' SEED SUPPLY, D.L.F.

THE necessity to obtain a supply of seed not only pure and of proper germinating strength, but even of known origin and of a definite strain, had for years been discussed among members of the agricultural societies. At the same time growers of seed had been contemplating how to combine to sell their seed to the best advantage on co-operative lines. These two problems were aimed at when in 1906 the Danish Agricultural Societies' Seed Supply Association, called D.L.F., was formed with the following object: to encourage the production of good seed and seed corn, to facilitate the transaction between growers and users of seed, and to further a profitable trade in good seed at home and abroad. To become a member a seed grower must be a member of an agricultural or a small-holders' society belonging to the D.L.F., and his ability as a grower of good seed must be vouched for by an inspecting Committee appointed by the D.L.F. No price is guaranteed the grower, but the D.L.F. undertakes to sell the seed best possible, deducting from the price only sufficient to cover administration expenses and to form a trading capital. The general assembly consists of delegates, one for each 20 members of the adjoined societies; it elects a central committee, which again elects a managing committee which appoints the necessary experts and office staff.

The Co-operative Wholesale Society, F.D.B., had already been engaged in growing and selling seed (see page 29). In 1913 a special agreement was entered into between the D.L.F. and the F.D.B., whereby the D.L.F. agreed not to buy seed nor to sell such by retail, but to place at the disposal of the F.D.B. so much of the seed produced as the F.D.B. can find a sale for, selling to farmers through the many local supply

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stores being members of the F.D.B. This latter Society, on the other hand, agrees to sell only seed delivered by the D.L.F. so long as this can supply sufficient. Should D.L.F. have any seed over, beyond what the F.D.B. requires, they can sell that wholesale in the open market. In this way a direct co-operation has been established between a co-operative producers' and a co-operative consumers' society.

The two societies try to regulate the production of seed each season according to what is the likely requirement. They also regulate the prices so that the producers shall get a good average price according to the market price for the season.

The production of and trade in seed by these two Societies amount to about two-fifths of the total trade of seed in the country, being more than the trade of any individual seed merchant in Denmark and the whole of Scandinavia. And the prices fixed by the two societies regulate very largely the prices charged by the private merchants.

The two societies own two large farms, "Oetoftegaard" and "Roskildegaard," where they produce improved strains of various kinds of seed, and try such produced by others, while they also grow samples of seed to control that these are what they claim to be.

The development of the D.L.F. and its trade is shown in the following table :—

	Number of Members.	Total Turnover.	Sale of Seed.	
			To F.D.B.	Wholesale in the Market.
		£	£	£
1911 ...	562	39,400	17,900	4,400
1916 ...	1,648	121,800	78,000	37,300
1921 ...	2,822	380,000	174,700	141,000
1927 ...	2,842	234,300	155,400	63,100
1928 ...	2,959	169,700	126,000	33,500

## CREDIT ASSOCIATIONS

THE Credit Associations were the very first manifestations of the co-operative movement in Denmark, and for that reason should have been mentioned in the first chapter, in conformity with the general chronological arrangement of the chapters. But for practical reasons it has been decided to deal with them in this part of the book, jointly with other co-operative financial undertakings such as banking, assurance, and the like.

At the time when the first Credit Associations were formed in Prussia in the eighteenth century, as mentioned in the introduction, the need of credit was also felt in Danish agriculture owing to the great reforms, the inclosures and general improvements. It was more or less successfully met by various Government measures. The Credit Associations known in Prussia as "Landschaften" were not generally known or properly understood in Denmark until in 1839 an economist, named Bergsøe, published a reasoned proposal to form a Credit Association of Danish landed estate-owners on the same lines as the German associations, of which he gave a full description, having made a study of them on a journey the previous year. His proposal was discussed at large agricultural meetings in 1845 and 1846, but hung fire until the free constitution of 1849 brought new men to the fore. A Law on Credit Associations and Credit Offices for Owners of Real Estates was passed in the Rigsdag on the 20th June, 1850, and this Law is the foundation of all the Credit Associations formed in Denmark.

This Law grants certain privileges and lays down certain conditions for obtaining them. The chief privilege exempts the Bonds issued by the Associations from stamp duty; these bonds may be either inscribed or to bearer; they may be transferred free of stamp duty. Should a debtor fail to discharge his obligations the Association may levy a distress and

sell the mortgaged property, with live and dead stock and other appurtenances, by auction without any necessity of legal mediation, judicial proceedings or judgment. The Law authorises public trustees of the estates of minors and of public institutions to invest these funds in the bonds issued by the Credit Associations. Finally, the Law grants to the associations the right to demand from their members a higher rate of interest than 4 per cent., which is the highest rate of interest on mortgages sanctioned by the law unless a special licence has been obtained in each instance ; it also authorises certain reductions in postal rates. In order to obtain these concessions and to have the bye-laws sanctioned by the Minister of the Interior, the Law requires the following conditions to be fulfilled :—

That before establishing an Association borrowers must be registered for a joint amount of at least £55,500.

That no member shall be granted a loan exceeding three-fifths of the value of his property fixed by assessment according to certain rules.

That there must at no time be in circulation a larger amount of Bonds issued by the Association than the total amount of the members' mortgages deposited with the Association.

That members shall be jointly and severally responsible for the Bonds issued by the Association to the extent of the full assessed value of their property, provided they have obtained a loan equal to three-fifths of that value ; and in the same ratio to the amount borrowed if this constitutes a lesser fraction of the assessed value.

That the members shall, besides interest on the loans, pay a suitable contribution towards the redemption of the bonds.

That Bonds shall not be issued to a lesser amount than £5, and shall bear interest.

That the Board shall annually publish the balance sheet of the Association, and shall each quarter send an abstract of the accounts to the Minister of the Interior.

That the bye-laws shall only be altered with the sanction of the Minister.

The Law, as it will be seen, did not grant many privileges, nor did it impose many or oppressive conditions. The Associations could be and were formed as purely private co-operative

associations, the members of which are the borrowers who, by becoming jointly responsible, increase their credit, and are thereby able to raise a joint loan; the creditors have ample security, as long experience has shown, on the properties of all the borrowers for the total loans received. While the individual borrowers or members are the debtors of the Association, the latter is the debtor of the actual lenders. The members, besides paying interest on that part of the joint loan which is granted them individually, pay a certain contribution to cover the expenses of administration, and to a reserve fund to meet possible losses, the surplus, if any, of such contributions being afterwards distributed among members. The Associations are fully self-governing; farmers and citizens, town and country, separately or jointly, may form such Associations, the highest authority in which is always vested in the general meeting elected by all members. Only one Association, that for the West and South Jutland, has given the bond-holders the right to vote at the general meeting.

A most important institution ensuring favourable conditions for working a system of loans on the security of land with permanent buildings and live and dead stock had been in existence in Denmark from early times. Not only is there a Land Register, in which each individual property is entered and described, but also an official Mortgage-Register, vested in the Courts, is kept, in which each property has its own special registry number and record in which every encumbrance must be entered. It is consequently an easy and also a very inexpensive matter to ascertain what security is available for a mortgage.

A few days after the Law of 1850 was passed meetings were called in Jutland and Sealand to form Credit Associations; on the 1st December, 1851, the bye-laws of "The Credit Association of Landed Estate Owners in Jutland" were approved, and on the 6th December, 1851, those of "The Credit Associations of Property Owners in the Danish Islands." The following year "The Credit Association for Jutland Towns" was formed. In 1859 an Association was formed which was a credit association neither in name, constitution nor administration, although it offered to obtain loans for owners of land; it was

called "The Hypothec Loan Association of Landed Estate Owners in Jutland." In 1860 two Credit Associations proper were formed, viz. "The Credit Association of Property Owners in the Island of Funen," and "The West and South of Jutland Credit Association."

In 1857 a financial crisis occurred which severely tested the stability of these various associations. The Hypothec Loan Association, which had from the first failed to attract the requisite number of borrowers and afterwards accepted others without sufficient discrimination, stopped payment. It had to take over several of the mortgaged properties, and the creditors suffered great losses, receiving only a quarter to one-third of the amount of the bonds, while several of the members, *i.e.* the borrowers, were ruined by their share in the joint liability. But it should be borne in mind that this Hypothec Association was in no real sense of the word a Credit Association.

"The Credit Association for Jutland Towns" was compelled to discontinue its lending operations, it was placed under public administration, and had to bear the expenses connected therewith in addition to the loss of about £53,000, sustained on taking over some members' properties, and yet in spite of this the owners of the bonds were paid in full, both as regards principal and interest. This is the only Danish Credit Association which has come to grief, and it affords a proof of the exceptional security afforded to capital by property owners' co-operative Credit Associations that no holder of their bonds has ever suffered any loss.

A certain nervousness caused by this failure led to the opinion that the existing Credit Associations ought to be enough for the need of the country, and an amending Law was passed in 1861, according to which new associations can only be formed by a special Law in each case. By the same Law it was arranged that the bonds issued by an association can be divided into "series," in such a way that the joint and several responsibility shall only apply to bonds belonging to the same series, provided that no series shall be closed until it comprises members representing an aggregate amount of at least £167,000. Members have the right—generally without notice—to pay off their loans in bonds or in cash, but "no member when retiring from the

Association or from a Series of the bonds of such Association shall receive his receipt cancelling his joint responsibility before the accounts for the year in question have been passed by the Minister of the Interior, with his endorsement that in his opinion there is sufficient security for meeting the joint liability." It did not take many years before this nervousness had passed off; as early as 1865 a bill for the establishment of a new Credit Association was brought in. During the debate it was declared that there was no more need to inquire whether there were enough Credit Associations than to inquire whether there were enough tailors in the town; people ought to be free to form what associations they wanted, competition between them would tend to increase the security offered in order to attract capital. This view prevailed, and the following Credit Associations have been established by special Laws: "The Credit Office for Landed Estates in the Islands" (1866); "The New Credit Association for Jutland Towns" (1868); "The Credit Association of Proprietors of Small Landed Properties in Jutland" (1880); "The Credit Association of Proprietors of Small Landed Properties in the Islands" (1880); "The Credit Association of Property Owners in Copenhagen" (1882); "The Credit Association of Property Owners in the Country Districts in Jutland" (1893); and "The Credit Association for Industrial Properties" (1897). At present there are twelve Credit Associations, their bye-laws and general organisation being very similar, except as to the two Associations for Small Landed Properties, which have a unique position.

The importance of small holdings (Husmandsbrug), which began to be realised in the thirties, led to certain reforms about the middle of the century, and many estates were subdivided, with the result that from 1850 to 1885 about 80,000 new small holdings were created, and by 1885 the number of small holdings reached 153,000.<sup>1</sup> To work and improve these their owners wanted capital, but they could not, according to the bye-laws of the Credit Associations, obtain loans through their agency when the capital value of the holding was less than £55 (in Jutland £110). When a smallholder (Husmand) wanted to raise a loan privately, he generally applied to his neighbour,

<sup>1</sup> Including agricultural labourers' cottage holdings.

the peasant farmer, who often stipulated that the smallholder, besides paying interest for the loan, frequently granted with six months' notice from the lender, should work certain days for the farmer during the busy season. The Agricultural Commission of 1875 pointed out how onerous this was for the smallholder, and in 1880 a Law was passed according to which the Credit Associations for Small Landed Properties in Jutland and the islands were established, with the following special privileges from the State: The State to guarantee interest at 4 per cent. p.a. on the bonds; <sup>1</sup> to pay to each Association once for all a grant of £550 to defray cost of establishment and assessment of the properties to which loans were granted; but on condition that loans should be granted only up to half the value of small holdings and to two-fifths of the value of cottages with allotments; that members of the Associations should be only those whose properties were valued at £220 or less; <sup>2</sup> that the loans should be repaid within 45 years; that the Minister of the Interior must sanction the election of the chairman of the Board, prescribe the rules for auditing the accounts, and appoint one of the auditors.

Credit Associations, as already explained, are co-operative associations of members seeking loans on the security of their real property. Before a property-owner is elected a member his property is assessed according to rules fixed by the Minister of the Interior by two valuers permanently engaged by the Association for the district or appointed by the Minister. The assessment must specify the sum which the property would fetch if sold. The Board of Directors then decides the amount of the loan they are willing to grant; the borrower deposits a bond with the Association for which he must pay stamp duty; he also defrays the cost of the valuation and of recording the bond on the Register of Mortgages. The Association then issues to the borrower bonds to the value of the loan and bearing the same interest as the loan. These bonds are, by the Law of 1850, exempt from stamp duty, as already explained. The creditor cannot demand repayment on notice; he has no

<sup>1</sup> This was amended in 1915, the State to guarantee interest up to 4½ per cent. on bonds for loans granted before December, 1920.

<sup>2</sup> Two years later increased to £330, and in 1908 increased to £550. For holdings with at least 2½ acres the limit was in 1915 fixed at £670.

power of foreclosure with regard to these bonds, but they are redeemable by the Association *pari passu* with the repayment of their debt by the members. It rests with the borrower himself to realise the bonds to the best advantage through a bank or broker, but all Credit Association bonds are quoted daily on the Copenhagen Stock Exchange. In fact, in these securities is invested by far the greater part of the private and public wealth of the kingdom. The member or borrower pays a contribution to the reserve fund, generally amounting to 2 per cent. of the loan, either immediately on receipt of the loan or in the course of two years, and a half-yearly charge, consisting of the interest on the outstanding debt, a contribution to the cost of administration and to the reserve fund and about  $\frac{1}{2}$  per cent. to a sinking fund. This half-yearly charge is generally a fixed one, and remains the same however much of the loan may have been paid off. A loan is generally redeemed in 60 to 65 years.

The portion of the members' half-yearly contribution set aside for reduction of the loan is employed in the redemption of bonds. It is decided by drawings every six months which numbers of the bonds are to be redeemed, and these are redeemed at their nominal value, at par. The numbers of the bonds drawn for redemption are advertised in the daily papers.

In some Associations an attempt was made in virtue of sanction given by Law of April, 1896, to establish sections granting wholly irredeemable or partly irredeemable loans, with corresponding irredeemable bonds. These irredeemable loans or irredeemable parts of the loans were not to exceed one-third of the assessed value of the property, while the redeemable part was to be paid back in 60 years or less. The quotations of the irredeemable bonds proving less favourable in the long run, these sections have enjoyed no great popularity among borrowers.

The only extraordinary way in which the Credit Association can favour the members is by converting the bonds when the state of money market allows of such action. Bond-holders cannot, of course, be compelled to accept a conversion of the bonds to carry a lower rate of interest than that at which they were originally issued, and if they refuse their consent they

must have their loans fully repaid in cash. The procedure adopted is, therefore, as follows: the Association makes use of its statutory right to give notice to repay the bonds in cash at par; at the same time the Association makes arrangement with one or more banks to accept the total amount in question in bonds bearing  $\frac{1}{2}$  per cent. lower interest. The cost of the conversion is defrayed by the members continuing for a time to pay the same half-yearly contribution as hitherto or by the reserve fund. From such conversion members derive the benefit of having the interest on their loans reduced by one-half per cent., but care must be taken not to force a conversion in circumstances which would make the bonds less saleable, which would only result in lower quotations. At the close of the seventies the abundance of money benefited new members, as new series were founded at lower rates of interest, while quotations for earlier series rose. But the old members derived no advantage. In 1887 the rate for  $4\frac{1}{2}$  per cent. bonds rose above par; the Government had converted its 4 per cent. debt to  $3\frac{1}{2}$  per cent. by a Law of 1886. The opportunity was taken advantage of by the Credit Association for Landed Estates on the Islands and the West and South Jutland Credit Association, which between them converted about £4,000,000 from  $4\frac{1}{2}$  per cent. to 4 per cent. In 1889 and in 1895 when the quotation for 4 per cent. bonds was again at par, all the Credit Associations availed themselves of the chance to convert about £27,800,000 of 4 per cent. bonds into  $3\frac{1}{2}$  per cent. This large reduction of interest, close upon £140,000 annually, entailed a large expense, too heavy for the reserve funds to meet, wherefore it was only carried through gradually, during the course of some years, the bonds being stamped with a notice to that effect.

After the conversion the money market very quickly became somewhat strained, and as early as 1900 it was necessary to commence issuing bonds at 4 per cent. for new loans, and from 1907 the  $4\frac{1}{2}$  per cent. series was commenced; the latter are the bonds at present most favoured by members.

The quotations on the Copenhagen Stock Exchange are generally the same for the bonds issued by the different Credit Associations at the same rate of interest. This applies to the open series. For the closed series the quotation will rise when

the time for their ordinary redemption approaches, because the chance of the bonds being drawn for redemption at par increases in the same ratio as that in which the instalment for the reduction of principal increases through the fixed half-yearly contributions paid by the members for that purpose. The bonds of the two Credit Associations for Small Landed Properties, bearing a Government guarantee for the payment of interest, are considered superior securities, and are generally quoted 1 to 2 per cent. higher than the corresponding bonds issued by the other Associations. A portion of the bonds of these two Associations is issued also in sterling, the bonds being payable in London.

An official inquiry was made in 1909 as to the total mortgage debt of properties in Denmark.<sup>1</sup> The total value of 169,500 agricultural holdings including live and dead stock and chattels pledged as security for loans, was estimated at £184,000,000, and the total encumbrances<sup>2</sup> at £78,700,000 or about 42½ per cent. of the total value. But some of those agricultural holdings, such as entailed properties, and those belonging to the State, municipalities, and public bodies, were only encumbered to a very slight extent; while those belonging to the small holdings created by the State under special laws were, under the provisions of these laws, heavily encumbered. If these properties, which are in an exceptional position with regard to the matter under investigation, be left out, 164,000 landed properties remain, for which the encumbrances amounted to 47 per cent., which, therefore, is regarded as the more reliable figure for the average encumbrance in 1909. About half of the total debt is contracted through the Credit Associations. Without the loans in question Danish agriculture would have been unable to enlarge and rebuild farm buildings, to increase very largely the number of live stock, to improve the dairy cattle so as to yield twice or three times as much as before, to carry out permanent improvement by draining and marling, to accommodate the farming system to the altered condition in the world's markets, to buy farm implements and machinery and to build

<sup>1</sup> Statistisk Tabelværk, 5 Række, Litra E, No. 9. See also Statistisk Aarbog. 1910, Table 94.

<sup>2</sup> Including a relatively quite small amount of loans from banks, capitalised servitudes and similar charges.

and equip many hundred co-operative factories. Although cases of abuse of the facilities for raising loans offered by the Credit Associations do undoubtedly exist, the benefits accruing from these Associations have been evident and widespread. Internally the Associations have secured for their members constantly improved conditions, and externally they have gained unprecedented confidence, so that the security offered to capitalists, even in the minds of investors abroad, approximates to that offered by the Government. The Danish Credit Associations may, therefore, be said to have fulfilled their object in a very satisfactory manner, and to have contributed in no insignificant degree to the economical prosperity of the country.

The Credit Associations, as already explained, grant loans only on a first mortgage on the properties, and they never grant loans up to the limit allowed by law, viz. up to three-fifths of the value of the properties. Further loans, on second mortgage, were sometimes raised by owners by private arrangements. A Law of 1897 authorised loan societies on co-operative lines to grant such secondary mortgage loans, ranking after the loans granted by credit associations, savings banks, public institutions, insurance companies and similar bodies. Such societies are called "Hypothec" Societies or Mortgage Associations. The bonds issued by them may be bearer bonds; inscribed bonds may be transferred free of stamp duty; but it is a condition that the name of the association as well as the bonds plainly indicate that the loans are issued on second mortgages on real property. Nine such associations have been formed, of which three deal with landed properties. Their constitutions are similar to those of the Credit Associations: they all have a guarantee fund, and both the borrowers and the bondholders have, as a rule, a voice in the management. The total mortgage on properties is restricted to 75 per cent. of the value. The interest on loans granted by these associations is naturally higher than on loans granted by Credit Associations, and the contributions to the reserve fund are larger.

## THE DANISH CO-OPERATIVE BANK AND CO-OPERATIVE VILLAGE BANKS

WHILE in most countries credit societies were developed before or simultaneously with other co-operative undertakings, and acted as or gradually developed into banking concerns, such regulation of co-operative credit came very late in Denmark, and has, indeed, only been taken up quite recently, apart from the Credit Associations just dealt with. This is probably explained by the fact that the many local savings banks have filled the need to some extent, and that the commercial banks as a rule have served co-operative undertakings in a satisfactory manner. But there have been several cases in which co-operators have experienced great difficulties in raising the necessary loans for new societies, such as the first co-operative bacon factory, the co-operative egg export society, a co-operative feeding-stuff society, co-operative supply stores, and others, even when ample security was offered. This caused considerable dissatisfaction in co-operative circles, and the feeling that joint and co-operative action in monetary matters was desirable was largely responsible for the formation, in 1898, of the Central Co-operative Committee, as also for the first Danish co-operative congress in 1903. A co-operative bank could be relied upon to support every new, healthy, co-operative effort, and through such a bank the co-operative societies with their very large turnover could partake in the profit on their banking operations which otherwise falls to the commercial banks.

In 1905 the Central Co-operative Committee sent out inquiries to all co-operative societies in order to learn how far they were well served by the existing banks and to what extent they would be willing to support a co-operative bank. A month later two of the leading banks in Copenhagen sent out circulars in which they tried to prove how dangerous it

might be to the nation if all banking operations connected with the greatest industry of the country were transferred to one single bank ; they, therefore, asked all banks to join in opposition to the proposed co-operative bank, and even contemplated approaching the Government in the matter. At a co-operative congress held in 1906, a committee was appointed to draw up a scheme for the bank and obtain binding signatures from the co-operative societies willing to join. In 1909, 236 societies had joined and signed a guarantee of £37,000. It was decided to found the bank—although it was not yet to start operations. A committee of representatives and a board of directors were elected, the chairman of the latter being Anders Nielsen, Svejstrup Østergaard, already mentioned several times in preceding chapters. At a general meeting held in 1913 it was decided to call upon the guarantors for the sums then agreed to, and to make preparation for the bank to start operation, and in October, 1914, the Co-operative Bank opened its offices in Aarhus. The object of the bank, as explained by the managing director, was to obtain higher prices for bank drafts in sterling or marks, to grant cheaper loans, and allow higher interest on deposits, but primarily to be ready to support every reasonable co-operative scheme submitted to it.

The original idea had been simply so to arrange monetary matters that co-operative societies could be financed by their own members. This, it was soon found, could only be accomplished by means of a bank, and a bank, it was soon realised, could only exist, if prepared to carry on all kinds of banking business for the benefit of its members. This, therefore, is the avowed object of the Co-operative Bank. The bank is formed by co-operative societies and savings banks, and such societies and savings banks can become members by taking shares in a fixed proportion to the total turnover of the co-operative societies or to the money paid in to the savings banks during the last completed year before joining. Private people can co-operate by joining a "bank society," which then becomes a member and takes shares in proportion to the number of its individual members. A further kind of members are the co-operative village banks—to be described below. These take shares like the savings banks in proportion to the money on

deposit. The members are the owners of the bank, but are liable for its obligations only to the amount of their holdings of shares. The surplus at the end of the year, after paying 4 per cent. interest on the share capital and setting aside a sum for the reserve fund, is distributed among members in proportion to the profit which the bank has made from its transactions of all kinds with the members. The bank will transact business with anybody, member or non-member; on the other hand, members need not transact their banking through the Co-operative Bank, but if they do not they have no share in the surplus.

If it had not been for the War there is no reason to think the Co-operative Bank should not have continued to prosper, but the financially dangerous years after the War proved too difficult for the Bank, whose main office had been moved to Copenhagen. In June, 1925, the Bank had to close, and after some attempts to have it reopened it had to be wound up, but it has been able to pay its shareholders 18s. 5d. in the £.

A kind of successor was formed already in November, 1925, "Dansk Andels og Folkebank" (Danish Co-operative and Folk Bank), which started with a capital of £11,000, soon increased to £100,000. It has done well so far, and has 19 branches in different towns.

An independent development has led to the formation in Denmark of a special kind of Co-operative Village Banks ("Andelskasser"). The Co-operative Bank has made it one of its objects to assist in forming these small, local banks and to co-operate with them. The object of the village bank is to carry on limited banking transactions on co-operative lines in the village, and to grant to members small loans for a short period. What gave rise to these village banks was two different requirements. One was caused by the accumulation of savings in some of the co-operative distributive societies, which, when invested in the usual way, were withdrawn from the locality where they might have been usefully employed. If, by means of a local bank, these amounts could be invested locally and lent to local farmers, it would be an advantage to them. The other was the need of farmers to get small loans to provide working capital. This need was felt all the more urgently, as

it had until recently been filled by the State. By a Law of 26th March, 1898, on Land-Loan Societies, the Government was empowered to lend £280,000 of the funds of the State at 3 per cent. per annum interest (in 1908 increased to 8½ per cent.) to societies of farmers formed for the purpose of granting to their members loans to run for a maximum term of nine months, at a rate of interest not exceeding 4½ per cent. per annum (in 1908 increased to 5 per cent.). The amount of the loan was not to exceed £2 16s. per head of large cattle normally kept on the farm. To such societies certain privileges were granted, such as exemption from stamp duty, and certain legal facilities; while on the other hand, certain restrictions were imposed upon them, submitting them to a control by the Minister of Agriculture. Two years after the Law had been passed, the total sum of £280,000 had been allocated to 168 societies, representing on the average about 1000 head of cattle, having a total number of 22,000 members, mostly small farmers and small-holders. The loan from the State to the societies varied from £1000 to £5000. Half the loans to the members were for only £10 or less. The amending Law of 1908 required the loans to the societies to be repaid to the State by instalments, two-tenths in June, 1908, and one-tenth in each of the following years, and the last tenth in June, 1916. Many of the societies were dissolved when the loan from the State was repaid, but some continued to grant loans from their own resources. A Law of 12th August, 1916, granted these societies some of the privileges on condition that they placed themselves under some control by the Minister of Agriculture; but it is uncertain whether these societies can maintain themselves. At any rate, most of the Land-Loan Societies have been dissolved, and the need of small loans for a short period to provide small farmers with working capital is therefore still felt in many districts.

It was a very natural thing to meet these needs in the village by forming an institution which could act both as a savings bank and as a loan bank, and the Co-operative Village Bank was designed for that purpose. But its chief use was soon found to lie in another direction. In every place which can be considered as a centre of co-operative activity, there is a great deal of money changing hands; every week the co-

operative dairy society pays the farmers, who are almost all co-operators in the dairy, for the milk delivered; the co-operative store receives money for goods supplied; the same is the case with co-operative societies for supplying seed, manures, and so forth. All these transactions, even the distribution of considerable amounts paid annually as surplus from the co-operative dairy or co-operative slaughter-house, are effected in cash. It is the aim of the Village Bank to avoid this risky and costly handling of cash by giving each co-operator an account to which can be credited what he is to receive from some of the co-operative societies, and debited what he has to pay to the other co-operative societies. It also introduces the use of cheques for money transactions between man and man, and may do some other simple banking business. And from the money available, including the savings of members, the Village Bank is able to grant the short loans for working capital needed by many small farmers. Finally, it has a considerable educational effect, being formed by and managed by the farmers themselves, who in this way gradually learn to handle money economically. The Village Banks work in close connection with the Co-operative Bank.

The first Co-operative Village Bank was formed in West Jutland in July, 1915; the following year seven others were formed, and during the next six months seven more. It looks as if another co-operative movement, started in the West of Jutland, is going to sweep over the country as the co-operative dairy system did a generation earlier.

Although the expectation of 1918 proved too sanguine, partly because of the difficult years after 1921, the Village Banks have been doing quite well. There were in 1930, 96 banks. About half the number have joined an association called "Danish Village Banks." It is estimated that the 96 banks have an annual turnover of £16,500,000, and a total balance of £800,000. Members are jointly and severally responsible for their local bank. The general assembly, where each member has one vote to be given personally, elects a committee of representatives who in turn elect a managing committee.

## INSURANCE SOCIETIES

THERE is reason to believe that as early as the eighteenth century Danish peasants formed primitive and informal village societies for the purpose of insuring against loss of live stock, a kind of co-operation whereby losses were at once covered by a levy on the members. Early in the nineteenth century several insurance societies were formed, of which one, dating from 1812, is still in existence. Its bye-laws, amended in 1855, containing reminiscences of the old village laws (in Danish "bye lov"), provided not only for the insurance of horses and cattle, but also for the keeping of a village bull and village boar for the common use of members, *i.e.* the peasants in the village. Down to the year 1900 there were as many as 41 such societies still in existence, which had been formed previous to the free constitution of 1849. All these were quite small and primitive in their organisation. After 1850 insurance societies were formed in greater numbers, and of more modern kinds, but most of them confined their sphere of action to one or two parishes, some of them even stipulating that only peasants could be admitted as members. Only one society was for farmers all over the country, and a few were for a group of parishes, a district (Amt). It was for some time a disputed point whether insurance societies should be small and co-operative, or large and joint stock companies; but, as was the case in France and Germany, the small societies eventually held the field. There is only one joint-stock insurance company in Denmark, *viz.* "Pan," formed in 1901. The reason is that small societies have the advantage that members have a better opportunity of controlling one another, a point which is of greater importance in societies insuring horses and cattle than in any other kind of insurance. The premiums in small societies are, therefore, smaller, and the costs of administration

are lower. With the great development of agriculture during the latter third of last century and the increasing value of the stock, the number of insurance societies increased considerably, notably between 1880 and 1910.

An official inquiry made in 1915<sup>1</sup> showed that there were then in operation 2221 societies, besides some which only insured against diseases, such as foot-and-mouth disease. Of these 2221 societies 1090 insured horses, 757 cattle, 212 pigs, and 162 insured several kinds of stock. The number of stock insured was : of horses, 405,000, or 78·6 per cent. of the total number of horses in the country, comprising the horses on 81·8 per cent. of all holdings with horses ; of cattle 330,000 head, being 14·5 per cent. of all the cattle in the country, but 36·4 per cent. of the number of herds. It appears from these figures that the animals insured belonged mainly to small herds. Sheep and pigs were insured only to an insignificant extent. The societies are mostly small, half the number of those insuring horses and cattle numbering less than 200 animals per society. The total value insured was : for horses £16,300,000 (average per horse £40), for cattle £5,440,000 (average per head £16 8s.). In annual premiums £390,000 are paid for horses, for cattle £111,000. The cost of administration is on an average 3 per cent. of the annual premiums.

It is generally stipulated by the societies that animals beyond a certain age or above a certain value are not accepted for insurance. This has led to the formation of special societies for insuring breeding stallions and bulls, the members of these societies being mostly breeding societies.

These voluntary co-operative insurance societies are not only established by and for the smaller farmers, the majority of the members in societies insuring cattle being smallholders (Husmænd), but are also managed by them with prudence and caution. Professor Harald Westergaard, to whose investigations most of the information of the older societies is due, said in his report : " If one had previously learnt to appreciate the ability and intelligence of the Danish smallholders, his estimation of them is certainly in no wise lessened

<sup>1</sup> Statistiske Efterretninger, 1916, No. 18 ; see also Statistisk Aarbog, 1916, Table 98.

by the study of these insurance societies by which something really important has been achieved by small means." <sup>1</sup>

There are 15 mutual insurance societies insuring their members against loss by hail,<sup>2</sup> the oldest one dating from 1864. The number of members is 84,400, the amount insured £11,000,000, the premium varies with the amount of damage to be covered. The total income was about £7000 in 1910, and about £40,000 in 1915, owing to the fact that the crops suffered considerable damage in 1914 and 1915. During the last two decades some seven mutual insurance societies have been formed, insuring their 87,000 members against damage to their buildings by storm, the total value insured being £32,000,000.

Among other insurance societies, one calls for special mention, viz. "The Employers' Liability Risk Insurance Society for Dairies and Agriculture." A Law of 7th January, 1898, on Employers' Liability in case of accidents to workmen engaged in factories using machinery, made owners of all co-operative and of most other dairies liable, and to meet the risk a mutual society was formed in November of the same year by 712 co-operative dairy societies. By the following year almost all the co-operative dairy societies and many private collective and estate dairies had joined. A Law of 27th May, 1908, imposed a similar liability on owners of agricultural holdings of a taxable value of not less than £450, while for smaller holdings, of which the owner is in a scarcely better economical position than his labourer, it gave facilities for both owner and labourer to insure themselves voluntarily against accidents occurring in the course of their agricultural work, the State paying half of the insurance premium. The above-named society obtained the sanction of the Minister of the Interior to widen the scope of its activity in effecting insurances under this Law; it also formed a branch for private insurances against accidents. In 1916 the society had about 158,000 members, of which about 1300 were dairy societies or owners of private dairies, 51,500 compulsorily insured and 14,000 voluntarily insured agricultural holdings, and about 90,000 private persons. The general

<sup>1</sup> *Tidskrift for Landökonomi*, 1903, p. 311.

<sup>2</sup> See note on previous page.

meeting, the highest authority of the society, consists of representatives, one for each of the twenty divisions into which the country is divided for the purpose of administration. Members are grouped around the dairies in their district ; meetings of all members of the insurance society living in the various dairy districts are held at the dairies every third year, immediately after the annual general meetings of the co-operative dairy societies. At these meetings representatives are elected for the dairy districts, one for each ; these representatives, together with delegates from each of the dairies, meet every three years within each of the twenty divisions, and elect the representatives to the general meeting, one for each division. The general meeting elects the board of management, consisting of five members. The board appoints a managing director.

In 1916 compensations were paid to the total amount of £30,000. In 1917 the society was authorised by the Minister of the Interior to cover risks under the Law of 6th July, 1916, consolidating previous enactments relating to accident insurance.

There is one Co-operative Life Insurance Society, called "Tryg" (*i.e.* secure), formed in 1904.

In 1899 the co-operative bacon factories formed a mutual employers' liability insurance against accidents ; in 1914 a mutual marine insurance and a mutual war risk insurance.

## VARIOUS CO-OPERATIVE AND SEMI-CO-OPERATIVE UNDERTAKINGS

*Co-operative use of Agricultural Machinery.*—Several co-operative societies have been formed for the purpose of joint purchase and use of steam or motor threshing machines. A loan is usually raised on joint liability at a local savings bank; when this has been repaid the expenses of keeping and working the thresher are apportioned according to the number of bushels of corn threshed for each member. Drills and other sowing machines, mowers, harvesters and self-binders are often used jointly on co-operative lines. By an official inquiry,<sup>1</sup> published in 1910, but referring to information collected in 1907, it was found that of the total number of agricultural holdings in the country on which the machines named were used, the following percentages correspond to the number of holdings where the farmers were co-operative users of the machines:—

Steam threshers ... ..	56	Drills ... ..	32
Electro-motor threshers ... ..	36	Mowers ... ..	19
Other motor threshers ... ..	44	Self-binders ... ..	13

Some societies own and work machinery for cleaning and sorting corn and seed of roots, grass, and clover.

*Co-operative Electric Generator Societies* have been formed to the number (in 1916) of 271. In 1914 the number was officially<sup>2</sup> stated to be 199, all being in the country districts. It is a question whether co-operative action in this field has not had the effect of splitting rather than of combining, and whether it may not have caused many local works to be built where a few central works would have produced the electricity more economically.

<sup>1</sup> Statistiske Meddelelser, 4 Række, 34 Binds 2 Hæfte.

<sup>2</sup> Statistisk Tabelværk, 5 Række, Lit. A., No. 7.

*Co-operative Marling Societies.*—There are two large societies, formed in 1907 and 1906, with 49 and 12 local branches respectively, distributing marl from large pits by the usual railways. Agricultural lime is also supplied to the members. The State encourages marling by paying 70 per cent. of the cost of carriage, the grant from the State amounting in 1916 to £15,000.

There are sixty other co-operative societies of purely local activity working on different lines. They carry the marl from a local pit to members within a distance of generally less than ten miles by means of movable light railways. The first of these societies was formed in 1905. On the budget for 1904–5 the State granted to the Danish Heath Society a sum of £500 for the purpose of buying a movable light railway to be let to private landowners for the purpose of transporting marl. The idea was found to work to great satisfaction, the farmers forming co-operative societies in order to hire the railway; year after year the grant was renewed, and increased until by 1912 a total of £24,000 had been voted. After that time it was not intended to spend any further capital on buying light railways. These remain the property of the Heath Society, which lets them out to the co-operative societies or to others, and to some extent supervises the use of them. The marling societies raise loans, on the joint liability of members, to pay for the marl, hire of railways, purchase of light locomotives, and so forth. Besides paying for the railways the State assists the marling societies by paying 2 per cent. of the loans of the societies, while the societies are to pay at least 3 per cent. and to repay the loans in less than ten years. On the budget of 1915–16 this State grant amounted to £5000. On these movable light railways over 3,000,000 cubic yards of marl were transported during the years 1904–1916.

*Co-operative Bakeries.*—About 1888 a few co-operative bakeries were started in Sealand, and in 1898 a few more were started in the north of Jutland. There are at present probably about ten co-operative bakeries in Denmark, all in country districts. In some towns joint-stock bakeries have been started by the labouring classes for a similar purpose, the shares to bear interest only at the ordinary rate, the surplus

to be paid into a sinking fund. The chief aim of the co-operative bakeries is to produce pure bread in clean bakeries; some of them have at the same time been able to return to members a surplus of 10 per cent. of the amount of their purchases of bread. Four co-operative bakeries and twenty-four "joint" bakeries combined in 1916 to form "The Danish Associated Co-operative and Joint Bakeries" for the joint purchase of raw materials and other requisities, for the promotion of common interests, and for an employers' liability risk insurance.

*Co-operative Flour Mills.*—Several—in 1914, according to official inquiry, thirty-two—co-operative flour mills are mentioned, but closer investigation seems to show that only a very few and quite small mills are run on true co-operative lines.

*The Danish Co-operative Cement Works* were planned in 1911, and began production in 1913. It is a co-operative society, the members being users or distributors of cement, such as co-operative distributive societies, co-operative purchase societies, and others, including individual users; members have to bind themselves for five years to take all the cement they use from the Co-operative Cement Works. On account of legal difficulties the works closed down in 1915, restricting operations to the sale of agricultural lime; but in February, 1917, the manufacture and sale of cement began again, the works having been meanwhile extended so as to produce double the quantity for which they were originally intended.

*Co-operative Building Societies.*—Although co-operative undertakings were, as has been previously explained, originally started many years ago for the benefit of the labouring classes in Danish towns, they have for many years been carried on almost exclusively by and for the rural population. Lately, however, co-operative distributive stores have sprung up in the metropolis, and there are signs that at last the artisan class and other townspeople realise how much benefit they can derive by applying co-operative principles in several of their pursuits. Building societies on co-operative lines were started in Copenhagen as early as 1866, and had a certain amount of success, both there and in other towns, but they gradually lost their character. A new and, as it seems, very serviceable principle has been introduced by *The Workmen's Co-operative Building Society*,

which was formed in Copenhagen in 1912 for the purpose of applying co-operative principles to the production and utilisation of dwellings. The co-operators become part-owners of the dwellings, which, according to the prevailing custom, are tenement houses with many small flats. Membership is open to individual persons, institutions and societies. Each member pays two guineas to the administration and reserve fund, and, if the member takes a flat, he pays a further contribution of £14 to £25 according to the size and amenities of the flat. On these contributions the society pays interest at 4 per cent. per annum. Each building unit or tenement house forms an independent branch of the society, and is managed independently. The rent is fixed so as to cover rates and taxes, repairs, and interest on loan, with a moderate addition to meet extra expenses. As the loan, which is generally raised through a credit association, is gradually repaid, and the annual expenditure of the branch thereby reduced, the rent paid by the members is gradually reduced. In former co-operative building societies a different system was followed, viz. to let the tenants gradually acquire the freehold of their houses (or jointly that of a tenement house) by paying full rent until the purchase sum had been paid. This had the undesirable result that members, who had become owners, in many cases succumbed to the temptation of selling to speculators, who then raised the rent, drove out the artisan families, and re-introduced all the evils which it was the object of the society to do away with. Therefore the Workmen's Co-operative Building Society does not let the property pass to members; these get their benefit in the shape of reduced rent, and only as long as they remain members of the society. If a member moves away from the society's building or withdraws from the society, the society refunds him his share in the property, but he cannot sublet his flat to a third party. The society disposes of the flat, which is let to a new member, who pays to the society a sum equal to that which the society has had to pay to the withdrawing member. In this way all chance of speculation in the flats is removed. The model dwelling-houses are very good and convenient, and the rent is considerably cheaper than that of equally good flats in other similar buildings.

The aim of the society is to build as perfect and as cheap dwellings as possible, and for that purpose it has become its own contractor, whereby it has accumulated very valuable experience. It also attempts to produce its own building materials and has bought a brick-works, producing annually four million bricks, which has proved a very profitable venture. It is at present building a factory for casting cement goods (pipes, bricks, tiles, etc.), and a plaster of Paris works. The cement is purchased from the Co-operative Cement Works, the Co-operative Building Society being a member of the Co-operative Cement Works Society. The Bank of the Co-operative Building Society is the Danish Co-operative Bank, of which society it also is a member. This co-operation between various co-operative societies has been found very useful.

The Workmen's Co-operative Building Society has built nine large model dwellings with more than 600 flats, at a total cost of £240,000, and several more dwellings are in course of erection. In most of these buildings are shops, used by branches of the "Metropolitan Co-operative Distributive Society," with which the building society has close co-operation.<sup>1</sup>

Another co-operative building society is *The Garden City "Grøndalsvænge"* in Copenhagen, which has adopted the same principle, viz. that the houses remain the property of the society, and that members remain tenants, the benefit they derive being reduced rent for good houses. The houses of this society are for one family each, with a good sized garden to each house. Although operations were delayed by the war, 41 houses were built in 1915, and, notwithstanding the increased cost of building, 102 more were built in 1917, the demand for them being very great. The society has bought from the municipality of Copenhagen ground for 420 houses in all, on condition that the municipality may buy back the ground after the year 2000 at the same price at which it was sold, whereby the total of the increase in value falls to the municipality. The average rent of a house with garden is about £2 2s. to £2 18s. per month. Members have to deposit with the society a sum of £28, which may be paid by weekly instalments. When the loans raised

<sup>1</sup> *Andelsbladet*, 1917, p. 761, and *International Co-op. Bulletin*, 1917, p. 129.

by the society have been reduced the rent will be correspondingly reduced. If a member moves, and therefore leaves the society, the £28 are returned to him with the amount he has contributed towards the repayment of loans and compensations for improvements in house and garden.<sup>1</sup>

<sup>1</sup> *Andelsbladet*, 1917, p. 843.

## THE CENTRAL CO-OPERATIVE COMMITTEE

IN 1898 delegates from various co-operative societies, viz. the Co-operative Slaughter-houses (Bacon Factories), two Associations of Co-operative Dairy Societies, the Co-operative Wholesale Society of Denmark (F.D.B.), the Danish Co-operative Egg Export, and the Jutland Co-operative Society for the Purchase of Feeding-stuffs met in Copenhagen and decided to form a Central Committee for mutual help, and to represent the societies in their relations to others. Since then representatives of other co-operative associations have from time to time been admitted to the C.C.C., and at a meeting held on 22nd June, 1917, a resolution was carried unanimously that the C.C.C. should in future consist of 22 members elected as follows: five by the Central Organisation of Danish Dairy Associations; three by the Co-operative Distributive Societies as represented by the Danish Co-operative Wholesale Society (F.D.B.); two by each of the following: the Co-operative Slaughter-houses, the Jutland Co-operative Society for the Purchase of Feeding-stuffs, the Danish Co-operative Bank, the Danish Co-operative Manure Supply Society of 1916; and one by each of the following: the Ringköbing District Co-operative Supply Societies, the Islands Co-operative Society for the Purchase of Feeding-stuffs, the Funen Co-operative Feeding-stuffs Company, the Danish Co-operative Egg Export, the Co-operative Cement Works, and the Danish Co-operative Coal Supply. The C.C.C. at first met in Copenhagen, but in 1910 moved its headquarters to Aarhus. The chairman and two vice-chairmen form the managing sub-committee.

The present chairman is Anders Nielsen, Svejstrup Östergaard. No other man has during later years done so much for the co-operative movement in Denmark as he. A son of a

Jutland farmer or peasant proprietor, he graduated at the Royal Agricultural College in Copenhagen. At the age of twenty-six he was elected chairman of the local agricultural society, and took part as such in the annual meetings of the Associated Jutland Societies, where he soon made his mark. He was mainly responsible for the formation of the Danish Dairies' Butter Mark Society, the Jutland Co-operative Society for the Purchase of Feeding-stuffs, the Danish Co-operative Dairy Societies' Joint Purchase Society and Engineering Works, the Danish Co-operative Manure Supply Society of 1916, the Danish Co-operative Bank, the Co-operative Cement Works, and others. He is the chairman of several of these undertakings. As his work in connection with these societies increased, he had to give up several responsible appointments in the central agricultural societies, but accepted in the autumn of 1916 his election as chairman of the Associated Jutland Agricultural Societies. As chairman of the Danish Dairies' Butter Mark Society he visited England twice in connection with legal proceedings for the protection of the Society's Trade Mark.

The C.C.C. has its own weekly paper, the *Andelsbladet*, i.e. *Co-operative Journal*, which was started in April, 1900, and until 1916 was edited by Anders Nielsen. It is the joint medium of the co-operative societies, and has a very large circulation. The C.C.C. has convened four national Co-operative Congresses, in 1903, 1906, 1911 and 1914, and intends from 1918 to convene annual meetings of delegates from all the co-operative societies in Denmark. The C.C.C. in 1900 joined the International Co-operative Alliance, with headquarters in London, and representatives of the C.C.C. have taken part in several of the International Congresses held by the Alliance. It has also joined an International Alliance of Agricultural Co-operative Societies.

In 1917 was formed the *Federation of Danish Co-operative Societies*, which aims at giving the various societies a more direct influence on the development. The C.C.C. acts as the managing committee of the Federation and calls annual Meetings of Delegates, each society being represented at these by a number of delegates fixed by the meeting and generally

being equal to the number of members of committee and representatives of the society. -

The Meetings of Delegates have discussed a matter which had hitherto been somewhat neglected, viz., the financial position of co-operative societies, the auditing of their accounts, their consolidation by the formation of a working capital, &c. Likewise have they dealt with the ever open question of the taxation of co-operative societies and explained the reason why they should not be taxed, at the same time pointing out that such co-operative societies which deal with others than members do pay taxes on their total surplus, which the Meeting in 1918 pointed out is really excessive taxation, as only the surplus derived from transactions with non-members ought to be taxable.

The C.C.C., besides its weekly paper, various reports and statistical information, caused to be published in 1917 the book on "Co-operation in Denmark," by H. Hertel, and in 1929 another book on the same subject, edited for the C.C.C. by Mr. A. Axelsen Drejer. The author of the present book is largely indebted to the C.C.C. for permission to make use of these two publications. Much additional information has been incorporated in this Second Edition from Mr. Axelsen Drejer's book and from information kindly supplied by him and others.

## THE AGRICULTURAL COUNCIL

IN 1919 the Agricultural Council was established by the Associated Danish Agricultural Societies, the Federation of Danish Co-operative Societies and the Royal Agricultural Society of Denmark, which are represented on the Council by respectively 5, 5 and 2 members. The office is in Copenhagen, under the able leadership of the Secretary-General, Mr. Högsbro Holm.

The object of the Agricultural Council is : (1) To encourage co-operation between the technical and economic organizations of Danish agriculture in those domains in which such co-operation is beneficial to agriculture, to take up problems of common interest which do not belong to the sphere of the separate organisations, but in such a way that the separate organizations continue to be at liberty to take up problems which belong to their special sphere ; (2) to place itself at the disposal of the Government and Parliament in matters affecting agriculture and to propose measures of industrial nature believed to be of benefit to agriculture ; (3) to represent agriculture abroad, eventually to send its own representatives abroad for the object of protecting agricultural and industrial interest ; (4) to represent agriculture in its relation to the other industries of the country ; (5) to combat the formation of rings and trusts believed to be detrimental to the interests of the community.

The leadership and administration of the Agricultural Council is placed in the keeping of a Præsidium of 3 members ; of this the Council first elects the acting chairman for a period of 3 years, and then a member for each of the organizations not represented in the Præsidium by the chairman. Contributions from the co-operative societies which deal with the sale of agricultural products form a working fund, the interest of which is at the disposal of the Council. If the expenditures

exceed the amount of the interest the deficit is covered by the organizations represented in the Council in proportion to the number of their representatives. The Agricultural Council has never applied for nor received grants from the State.

The Council publishes : (1) " Landbrugsraadets Meddelelser," a pamphlet appearing weekly and containing, among other matters, reports from the State agricultural advisers abroad and synopses of foreign agricultural conditions ; statistics on the export of agricultural products and summaries of market conditions are published as well as information on the import of articles necessary to agricultural production. (2) Special publications. The Council issues reprints of those articles appearing in " Landbrugsraadets Meddelelser " which may be of particular interest. (3) An annual report of the work done by the Agricultural Council.

## OFFICIAL CONTROL OF DANISH AGRICULTURAL PRODUCE

**THERE** are three Control Services under the Ministry of Agriculture, viz. :—

One for Live Stock under the Chief Veterinary Officer, with two Veterinary Inspectors and two Deputy Veterinary Inspectors ;

One for Dairy Produce and Eggs under a Chief Inspector with four Inspectors and 13 Controllers ; and

One for Meat, including Bacon, under the Chief Veterinary Officer, with two Veterinary Inspectors, and one Deputy Veterinary Inspector. They supervise the work of the Veterinary Surgeons appointed by the Ministry of Agriculture, to a number of about 250, attached to the various registered slaughterhouses and bacon factories.

Besides these Services there has lately been appointed one Inspector with one Assistant in order to see to it that the bacon factories observe the Regulations issued by the Ministry of Agriculture at the suggestion of the Federation of Danish Bacon Factories. These Regulations deal with the manufacture of bacon and aim at securing uniformity in the trimming, salting and other treatment of the carcasses.

A pamphlet on the “ Control of Export of Agricultural Produce from Denmark ” was published by the Ministry in June, 1929. Complete translations of Laws and Regulations were published by the Ministry :—

In 1925 dealing with the Export of Meat, including Bacon ;

In 1926 dealing with Butter and Margarine ; and

In 1929 dealing with Eggs, Cheese and Milk Conserves.

Copies of these publications may be obtained from the Ministry of Agriculture, Copenhagen, or from the Agricultural Adviser to the Danish Legation in London.



## APPENDIX I

### STATEMENT OF THE TURNOVER IN DANISH CO-OPERATIVE SOCIETIES IN THE YEARS 1929 & 1930.<sup>1</sup>

#### A. CO-OPERATIVE SOCIETIES OF CONSUMERS.

	1930.	1929.
	£	£
Co-operative Supply Stores ... ..	14,560,000	14,560,000
Co-operative Wholesale Society ... ..	7,802,000	7,780,000
Ringkøbing Co-operative Societies ... ..	214,000	220,000
	£22,576,000	22,560,000
Total of Group A ...		

#### B. CO-OPERATIVE SOCIETIES OF PRODUCERS.

##### I. Societies for Production and Sale.

	£	£
Co-operative Dairy Societies ... ..	36,260,000	41,210,000
Co-operative Butter Export Societies ... ..	10,990,000	11,470,000
Co-operative Slaughter-houses—		
(a) Slaughter-house Produce ... ..	27,640,000	27,250,000
(b) Egg Export ... ..	420,000	420,000
Danish Co-operative Egg Export ... ..	824,000	819,000
Cattle Export Societies ... ..	511,000	632,000
Agricultural Societies' Seed Supply ... ..	291,000	236,000
	£76,936,000	82,037,000
Total of Group B, I. ...		

##### II. Societies for Agricultural Supplies.

	£	£
Societies for the Purchase of Feeding Stuffs... ..	6,429,000	7,846,000
Co-operative Manure Supply ... ..	1,264,000	1,368,000
Dairy Societies' Purchase and Machine Supply ... ..	368,000	340,000
Co-operative Cement Factory ... ..	274,000	275,000
Co-operative Coal Supply ... ..	247,000	291,000
	£8,582,000	10,120,000
Total of Group B, II. ...		

#### C. VARIOUS OTHER CO-OPERATIVE SOCIETIES

	495,000	511,000
Grand Total ... ..	£108,589,000	115,228,000

<sup>1</sup> *Andelsbladet*, 2nd January, 1931.



## APPENDIX II

### OFFICIAL DANISH STATISTICS.

#### I. POPULATION OF DENMARK.

			Total.	Living by agriculture, horticulture forestry and fishery.	
1840	...	...	1,289,075	596,751	46·2 per cent.
1880	...	...	1,969,039	888,931	45·1
1901	...	...	2,449,540	971,894	39·6
1911	...	...	2,757,076	1,003,716	36·4
1921	...	...	3,267,831	1,077,175	33·0
1930	...	...	3,542,210		"

#### 2. AGRICULTURAL POPULATION IN 1921.

The population in Towns was in 1921	...	...	...	1,410,866
" " Rural Districts was in 1921	...	...	...	1,856,965

Living entirely by agricultural were	...	990,505	or 30·3	per cent.
" by horticulture	...	25,722		
" by forestry	...	21,294		
" by fishery	...	39,654		

1,077,175 or 33 per cent.

Estate owners	...	...	...	1,738
Peasants and farmers	...	...	...	68,572
Small-holders	...	...	...	108,971
Others	...	...	...	1,614
Total Employers	...	...	...	180,895
Employees	...	...	...	262,756
Dependents	...	...	...	546,854

Total ... .. 990,505

#### 3. NUMBER OF AGRICULTURAL HOLDINGS FROM 1850 TO 1905.\*

	Number.			Per cent.	
	Total.	Freehold.	Leasehold and tenancy.	Freehold.	Leasehold.
1850	180,090	103,518	76,572	57·5	42·5
1860	211,315	146,234	65,081	69·2	30·8
1873	239,419	194,263	45,156	81·1	18·9
1885	263,432	225,255	38,177	85·5	14·5
1895	270,918	236,709	34,209	87·4	12·6
1905	289,130	259,874	29,256	89·9	10·1

About 92 per cent. of Holdings are now cultivated by the owners.

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## 4. SMALL-HOLDINGS CREATED BY SPECIAL LAWS.

Under Laws of 1899 and amending Laws—					
				Number of	
				Holdings.	Loans by State.
Created 1900-1928	...	...	...	13,755	£63,200,000
Additional Loans	...	...	...		£9,100,000
Under Laws of 1919—					Total Acreage.
Created 1920-1928	...	...	...	4,095	69,883 acres.
Supplementary Plots	...	...	...	1,749	10,762 „

## 5. NUMBER AND TOTAL AREA OF AGRICULTURAL HOLDINGS IN DENMARK AS ESTIMATED IN 1901 AND 1919.

Groups by Acres.			Numbers.		Total Area.—Acres.	
1901.		1919.	1901.	1919.	1901.	1919.
1.	Below 8·12	1·36 - 8·4	116,614*	43,891	261,264*	228,687
2.	8·12- 24·5	8·4 - 24·7	45,880	65,254	690,693	1,110,579
3.	24·5 - 36·8	24·7 - 37·1	17,723	25,494	541,888	903,333
4.	36·8 - 73·6	37·1 - 74·1	35,257	43,364	1,910,513	2,699,414
5.	73·6 - 147·2	74·1 - 148·2	25,615	22,552	2,558,400	2,625,966
6.	147·2 - 294·4	148·2 - 296·4	6,502	4,039	1,275,205	958,423
7.	294·4 - 588·8	296·4 - 592·8	1,570	916	626,922	457,511
8.	Above 588·8	Above 592·8	822	416	1,051,503	449,276
Small-holdings.						
	Below 24·5	1·36 - 24·7	162,494*	109,145	951,957*	1,339,266
Middle-sized farms						
	24·5 - 147·2	24·7 - 148·2	78,595	91,410	5,010,801	6,228,713
Large Holdings.						
	Above 147·2	Above 148·2	8,894	5,370	2,953,630	1,863,210
Total Holdings			349,983*	205,929	8,916,388*	9,431,189

\* The figures for 1901 include a large number, probably about 70,000 cottages with less than 1·36 acre of land, which is not included in 1919.

## NUMBER OF HOLDINGS IN 1850 and 1905, AND PERCENTAGE FREEHOLDS, CLASSIFIED IN THREE GROUPS ACCORDING TO SIZE.

	...	Number.		Per cent. Freehold.	
		1850.	1905.	1850.	1905.
Small-holdings	...	142,007	254,581	50	87
Farms	...	33,386	26,867	67	95
Large Holdings	...	1,800	2,033	82	99

6. ACREAGE  
IN 1,000 ACRES.

	1888.	1896.	1907.	1916.	1928.
Total area (including water) ...	9,488	9,502	9,629	9,645	10,607 <sup>1</sup>
Acreege under crops and grass ...	7,079	7,296	7,211	—	6,940 <sup>2</sup>
Arable land ... ..	6,263	6,378	6,128	6,157	6,892
Permanent grass ... ..	816	918	1,083	—	—
Wheat ... ..	120	85	100	152	252
Rye ... ..	694	718	681	481	361
Barley and bere... ..	736	691	578	633	877
Oats ... ..	1,053	1,086	996	1,042	1,000
Mixed corn and pulse ... ..	230	296	419	457	733
Total corn ... ..	2,833	2,876	2,774	2,765	3,223
Potatoes ... ..	129	130	134	159	155
Mangolds ... ..	46		207	276	346
Swedes ... ..	5		187	246	517
Turnips ... ..	44	220	171	150	126
Sugar beet ... ..	18		40	78	113
Carrots and chicory ... ..	18		23	20	14
Total roots ... ..	260	350	762	929	1,271
Seed of grass, roots and clover	9	10	10	42	60
Pulse and buckwheat ... ..	99	52	38	20	15
Other crops ... ..	54	24	33	—	5
Fallow ... ..	485	478	261	174	75
Bastard fallow ... ..	154	132	177	191	105
Green crops ... ..	104	122	181	90	54
Grass and clover in rotation ...	2,265	2,334	1,892	1,946	1,696
Permanent grass ... ..	—	121	229	—	329
Lucerne ... ..	0	1	18	—	45
Meadows ... ..	567	563	551	—	—
Bogland and common ... ..	249	233	285	—	—
Woods and plantations ... ..	560	665	801	—	—
Gardens and nurseries ... ..	70	81	95	—	—

<sup>1</sup> For the year 1925.<sup>2</sup> For the year 1919.

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Of the total acreage devoted to roots the following percentages were grown with potatoes, with roots for feeding, and with other roots :—

	Potatoes.	Roots for feeding.	Other roots.
1871 ... ..	88·4	11·6	—
1888 ... ..	49·7	43·5	6·8
1901 ... ..	25·5	67·3	7·2
1912 ... ..	17·1	73·6	9·3

(“ Landbrugets Ordbog,” 3 Bind, 1912, p. 70.)

### 7. PRODUCE OF CROPS.

#### YEARLY AVERAGES.

	1895-1904.	1905-9.	1910-14.	1919-23.	1927-29.
	1000 Quarters.	1000 Quarters.	1000 Quarters.	1000 Quarters.	1000 Quarters.
Wheat ... ..	441	503	608	840	1,081
Rye ... ..	2,178	2,229	2,056	1,321	948
Barley ... ..	2,612	2,156	2,233	2,302	3,895
Bere ... ..		496	466	225	208
Oats, white ... ..	4,686	4,084	4,362	3,926	5,004
Oats, black ... ..		762	715	501	465
Oats and barley mixed ...	1,502	1,795	2,133	1,834	3,269
Buckwheat ... ..	46	39	20	10	4
Pulse ... ..	54	59	51	103	35
<b>Total corn ... ..</b>	<b>11,519</b>	<b>12,123</b>	<b>12,644</b>	<b>11,062</b>	<b>14,909</b>
	1000 Tons.	1000 Tons.	1000 Tons.	1000 Tons.	1000 Tons.
Potatoes ... ..	560	692	901	1,333	938
Mangolds ... ..	1,966	3,984	4,551	4,797	7,528
Swedes ... ..	1,198	3,204	4,598	7,039	11,297
Turnips ... ..	1,918	2,664	2,684	2,278	2,304
Carrots ... ..	199	245	232	120	128
Sugar beet ... ..	370	455	825	815	1,095
Chicory ... ..	14	16	22	14	13
<b>Total root crops ... ..</b>	<b>6,225</b>	<b>11,260</b>	<b>13,813</b>	<b>16,396</b>	<b>23,303</b>
Hay ... ..	1,592	1,970	1,884	1,520	1,630
Straw ... ..	2,765	3,355	3,268	3,250	5,610

## 8. THE TOTAL PRODUCE OF CROPS.

The total produce of the crops of the different years cannot be directly compared unless the amounts of corn, roots, hay and straw be reduced to a common unit. This has been attempted in the following way. As unit is taken *one ton of corn*, which has been named a "unit of crops." The various crops are considered in respect to their value as food for cattle, based on the results of many years' investigations. Equal weights of different kinds of corn are considered to have equal value. The "total solids" in roots have the same value as an equal weight of corn. Hay and straw also are converted into "units of crops" according to their value as food,  $2\frac{1}{2}$  tons of hay and 5 tons of straw being taken as equal to one ton of corn or one "unit of crops."

In this way the average annual total produce of crops has been estimated for the following five-yearly periods to be—

1879-83	...	...	...	...	3,050,000	units of crops or tons.
1889-93	...	...	...	...	3,460,000	" "
1899-1903	...	...	...	...	4,030,000	" "
1909-13	...	...	...	...	5,390,000	" "
1919-23	...	...	...	...	7,263,000	" "
1924-28	...	...	...	...	9,033,000	" "
1929	...	...	...	...	10,060,000	" "

## 9. AVERAGE YIELD

IN HKG. PER HECTARE.<sup>1</sup>

	Wheat.	Rye.	Barley.	Oats.	Mixed Corn.	Pulse.
1889-93 ...	25.5	17.3	17.5	13.9	16.3	12.3
1899-1903 ...	28.6	17.2	19.7	16.2	18.4	13.7
1909-13 ...	29.7	18.1	22.5	18.5	20.2	16.6
1923-27 ...	26.7	15.4	24.2	20.7	21.3	17.0
1928-29 ...	31.7	17.1	30.8	26.6	25.5	—

IN TONS PER HECTARE.<sup>2</sup>

	Potatoes.	Mangolds.	Swedes.	Turnips.	Sugar Beet.	Carrots.
1889-93 ...	8.5	43.8	44.7	38.2	27.2	28.1
1899-1903 ...	11.0	41.6	43.0	36.3	26.7	28.8
1909-13 ...	14.1	51.4	47.1	40.2	30.1	28.0
1923-27 ...	12.3	54.2	51.9	43.0	27.5	27.2
1928-29 ...	17.8	55.7	57.2	49.3	28.0	29.8

<sup>1</sup> One hkg. of wheat per hectare = 1.45 bushels per acre.

<sup>2</sup> One ton per hectare = about 0.405 ton per acre.

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## 10. NUMBER OF LIVE STOCK IN THOUSANDS, ON THE 15TH JULY.

	1881.	1898.	1909.	1914.	1923.	1930.
Horses ... ..	348	449	535	567	562	516
Bulls, above 1 year ...	18	42	73	96	58	74
Bullocks, above 1 year ...	95	71	58	68	81	62
Cows and heifers which have calved ... ..	899	1,067	1,282	1,310	1,339	1,033
Calves and young stock ...	458	565	841	989	1,045	1,332
Total cattle ... ..	1,470	1,745	2,254	2,463	2,523	3,101
Boars, 4 months and above	—	7	8	13	15	24
Breeding sows, 4 months and above ... ..	—	136	148	283	320	588
Pigs for fattening, 4 months and above ... ..	—	337	422	707	572	1,023
Young pigs ... ..	—	688	890	1,494	1,949	3,294
Total pigs ... ..	527	1,168	1,468	2,497	2,855	4,929 <sup>1</sup>
Sheep ... ..	1,549	1,074	727	515	233 <sup>2</sup>	—

## 11. YIELD OF MILK AND BUTTER.

There are no official statistics of the yield of milk and of butter per cow, and reliable figures are only to hand from later years. In a paper read at the Winnipeg meeting of the British Association, 1909,<sup>3</sup> Mr. P. A. Mørkeberg, Danish Government Live Stock Commissioner, estimates the average yield of butter by all Danish cows at 80 lbs. in 1864 ; 116 lbs. in 1887, and 220 lbs. in 1908.

The annual Dairy Statistics,<sup>4</sup> giving detailed information, collected from most of the Co-operative Dairy Societies, contain figures from which the following table has been compiled. It applies to so many cows, spread over the country, and in no way selected, that the average yields of milk and percentages of fat in the milk may well be taken to apply to the whole stock of cows in the country.

<sup>1</sup> On the 15th January, 1931, the total number of pigs was 5,232,063.

<sup>2</sup> In 1926.

<sup>3</sup> *Journal of the Board of Agriculture*, 1910, p. 998.

<sup>4</sup> Danmarks Mejeri-Drift-Statistik, 1902-1916, described on p. 50.

Years.	Average number of dairies reporting.	Average number of members in dairy societies.	Average number of cows per society.	Total number of cows.	Yield of milk per cow.	Per cent- age of Fat.
1902-06 ...	507	—	ca. 980	490,000	Gallons. 510	3.44
1912-16 ...	728	153	936	680,000	554	3.51

This table shows an increase during the ten years of  $8\frac{1}{2}$  per cent. in the yield of milk and of 2 per cent. in the percentage of fat.

The Association of Bull Clubs and Control Societies in Funen have published information of the yield of the Red Danish Dairy Cattle in Funen.<sup>1</sup> It deals with—

A. All the cows in the herds of members ;

B. All normal cows, not including heifers, cows going farrow or having cast the calf. The figures for the year 1915-16 are as follows :—

				Number of cows.	Yield of milk per cow.	Percentage of fat.	Yield of butter.
A	...	...	...	40,116	Gallons. 794	3.65	lbs. 323
B	...	...	...	19,691	860	3.64	350

In the above-quoted paper Mr. Mörkeberg describes certain competitions between entire dairy herds, carried on during two whole years, with periodical weighing of the milk of each individual cow, testing the percentage of fat, weighing the fodder given to each cow, etc. Four such competitions have been carried on among herds of Red Danish Dairy Cattle in Sealand, beginning respectively, 1897, 1899, 1905, and 1911. From the reports of these competitions the following data have been extracted.<sup>2</sup>

The number of herds entered were 5, 6, 15, and 10, and the number of cows—whether in milk or not—were 102, 319, 441, and 445 respectively. The average yield per annum of *all cows*, including heifers, in these herds during two years was :—

<sup>1</sup> Føllesledelsen af Kvægavls-og Kontrolforeninger i Fyns Stift, Odense 1917.

<sup>2</sup> Beretning om to-aarige Konkurrencer, udgivet af Sjøllandske Landboforeninger, 1899-1914.

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				Yield of milk.	Percentage of fat.	Yield of butter.
				Gallons		lbs.
1897	...	...	...	711·2	3·39	277·8
1899	...	...	...	773·2	3·39	302·0
1905	...	...	...	791·3	3·66	332·9
1911	...	...	...	932·2	3·86	414·5

The average yield of *all cows* in each of the four best herds in the first and the last of these competitions was :—

## COMPETITION 1897-99.

				Yield of milk.	Percentage of fat.	Yield of butter.
				gallons		lbs.
First herd	...	...	...	772·2	3·44	305·3
Second herd	...	...	...	800·5	3·44	316·4
Third herd	...	...	...	747·6	3·30	282·2
Fourth herd	...	...	...	810·8	3·31	307·5

## COMPETITION 1911-13.

				Yield of milk.	Percentage of fat.	Yield of butter.
				gallons		lbs.
First herd	...	...	...	979·0	4·05	456·4
Second herd	...	...	...	990·3	4·02	460·7
Third herd	...	...	...	948·4	3·97	434·3
Fourth herd	...	...	...	981·3	3·81	429·9

Similar competitions have been carried on in Funen with cattle of the same breed, beginning in 1894. The seventh competition was carried on during the years 1913 to 1915. The results have been published from 1897 to 1916.<sup>1</sup> In the first, fourth and seventh competition, 7, 18, and 10 whole herds were entered with 530, 777, and 304 cows respectively. The results for *all cows*, including heifers, cows that did not calve during the year, and cows not in milk, are given as follows :—

<sup>1</sup> Beretning om to-aarige Konkurrencer mellem hele Kvæghold i Fyens Stift.

			Yield of milk.	Percentage of fat.	Yield of butter.
			gallons.		lbs.
1. 1894-96	..	..	697	3.44	266
4. 1903-05	..	..	853	3.53	334
7. 1913-15	..	..	934	3.83	398

From the above will appear the development in the yield of milk and "butter" up to the year 1916. It is now customary to state the yield in "butterfat" instead of calculating this into butter.

The development in yield of milk and butterfat has been continued in later years by the systematic breeding from the best yielding animals, and particularly by using bulls with a known capacity for increasing the yield of the offspring. It should be noticed that there is a difference between the aim of this development in Denmark and in some other countries. While in some of these the aim has been to produce a very high yield in certain single cows irrespective of cost and by special treatment, the aim in Denmark has been to raise the yield of the total stock of cows in the country living under normal conditions. Denmark cannot therefore boast of extraordinary yields of single cows, but can, as the following figures will indicate, show a very creditable development of the yield by the whole stock of cows, and even more if only the cows in the Milk Recording Societies, the so called "controlled" cows, are considered.

#### YIELDS OF MILK AND BUTTERFAT BY ALL COWS IN DENMARK.

Year.	No. of Cows. 1000.	Average per Cow.		Total yield.		Lbs. of Milk to one lb. of Butter.
		Milk. lbs.	Butterfat. lbs.	Milk. Million lbs.	Butterfat. Million lbs.	
1914	1,310	6,060	215	7,940	282	25.3
1924	1,369	6,610	241	9,050	330	24.4
1929	1,579	7,050	261	11,133	410	23.6
1930	1,632	7,275	271	11,883	441	23.5

The Milk Recording Societies or Control Societies are gradually spreading so that now nearly half the total number of cows are "controlled." Taking all "controlled" cows on the islands, we find the following average yields of the Red Danish Dairy Cattle.

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## YIELDS OF ALL "CONTROLLED" COWS IN THE DANISH ISLANDS.

Year.	Number of controlled Cows as percentage of all Cows.	Average Yields per Cow.		
		Milk. lbs.	Butterfat. per cent.	Butterfat. lbs.
1910/11 ...	20	7,260	3.55	257.7
1920/21 ...	24	7,377	3.64	268.5
1928/29 ...	45	7,908	3.85	304.5
1929/30 ...	48	8,223	3.86	317.5
In Funen 1929/30 ...	60	8,818	3.89	343.0

The last line gives the figures for the island of Funen.

For those accustomed to reckon milk yield in gallons it may be sufficient to take one gallon equal to 10 lbs., so that the cows in Funen have an average yield of 882 gallons.

The above figures are calculated for all cows, old or young, good or bad milkers, and calculated per cow in 365 days. Several cows of Red Danish Dairy Cattle have yielded over 12,000 lbs. of milk and over 1,100 lbs. of butterfat in a year. One cow in the herd book of R.D.D.C. yielded 27,000 lbs. of milk in one year.

## IMPORT INTO AND EXPORT FROM DENMARK OF AGRICULTURAL PRODUCE, FROM 1876-80 TO 1925-29.<sup>1</sup>

Yearly averages.		1876-80.	1886-90.	1896-1900.	1906-09.	1910-13.	1925-29.
		£1000	£1000	£1000	£1000	£1000	£1000
Live Animals,	Import	305	281	143	939	555	322
	Export	2,720	2,205	1,209	2,231	3,300	4,082
	Surplus Export	2,415	1,924	1,066	1,292	2,745	3,750
Animal Produce,	Import	757	1,434	3,089	4,912	3,114	1,627
	Export	1,900	5,138	12,015	20,938	24,633	63,330
	Surplus Export	1,143	3,704	8,926	16,026	21,519	61,703
Corn, Flour and Meal,	Import	1,210	1,621	3,345	5,482	5,808	11,386
	Export	2,706	935	753	1,085	862	1,151
	Surplus Import	-1,496 <sup>2</sup>	686	2,592	4,397	4,946	10,235
Feeding Stuffs and Seed,	Import	615	1,272	1,826	4,960	4,934	8,636
	Export	88	99	213	711	512	1,155
	Surplus Import	527	1,173	1,613	4,249	4,422	7,481

<sup>1</sup> "Statistiske Sammendrag," 1913 (1876-1911); "Statistisk Tabelværk," 5 Række, Littr. D. No. 30 and 31 and No. 46 to 50. <sup>2</sup> Surplus Export.

13. EXPORT FROM DENMARK OF HOME-PRODUCED BUTTER, BACON AND HAMS, AND EGGS, FROM 1881-85 TO 1925-29.<sup>1</sup>

Yearly averages.	Butter. <sup>2</sup>	Bacon and hams.	Eggs. 1000 gt. hunds.
	Tons.	Tons.	
1881-85 ... ..	15,630	7,940	478
1886-90 ... ..	29,730	23,980	913
1891-95 ... ..	48,070	41,270	1,243
1896-1900 ... ..	57,396	64,860	2,222
1901-05 ... ..	76,044	76,390	3,531
1906-10 ... ..	90,180	95,400	3,357
1911-15 ... ..	99,420	128,840 <sup>4</sup>	3,596 <sup>4</sup>
1925-29 ... ..	141,054	232,028	6,764

<sup>1</sup> "Statistisk Tabelværk," 4 Række, Lit. D. No. 96. (1887) to 5 Række, Lit. D. No. 50 (1929).

<sup>2</sup> Including export of cream calculated as butter. See end of chapter on Co-operative Butter Export Societies.

<sup>3</sup> Including Mess-Pork.

<sup>4</sup> 1911-14.



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