

EXTRACTS.

Cattle Breeding and Dairy Industry.*(From page 38 February issue.)*

FEEDING OF CATTLE.

How to provide sufficient food of a wholesome nature for milch cattle is another problem which is receiving close attention on Government farms. No matter what potentialities have been bred into a cow, she will fail to give a big yield of milk if given too little or unwholesome food. In India generally there are no pastures worthy of the name, and fodder crops as such are not commonly grown. In most parts of the country, moreover, many useless cattle are kept which get a share of the very limited supply of fodder available to the detriment of those that are deserving of better treatment. Under these conditions no great improvement can be effected by better breeding without first improving the food supply; better feeding is as important as better breeding in short. On Government dairy farms much attention is being paid to this question of cow feeding: luscious fodders unknown in India 20 years ago such as Berseem (Egyptian clover) have been introduced and methods of storing green fodders in silos adopted. The question of how to make silage most economically has been discussed at great length at meetings of the Board of Agriculture and in some provinces the making of silage in kutchha pits is now being demonstrated in the districts.

At the Imperial Institute of Animal Husbandry and Dairying at Bangalore accurate information regarding the digestibility and the feeding value of different cattle foodstuffs is being collected. Facilities have also been afforded at this Institute and at the Agricultural Institute at Allahabad, for the thorough training of young Indians in the science and technique of animal husbandry and dairying. These young men should in course of time play an important part in organizing the industry on scientific and business lines.

CO-ORDINATION OF ACTIVITIES.

With a view to stimulating and to some extent co-ordinating the efforts being made towards cattle improvement, the Government of India have established a Cattle Bureau the control of which is vested in the Imperial Dairy Expert and his headquar-

ters are at Bangalore. The main duties of this Bureau to commence with will be (1) to collect and disseminate information concerning cattle breeding and allied subjects, (2) to assist in the disposal of surplus pedigreed stock available on Government cattle-breeding farms, (3) to standardise breeding records and methods of milk recording, (4) to maintain general herd-books of breeds or of milch cattle as distinct from specific breeds found in more than one province or State, and (5) to keep the officers in charge of cattle breeding in provinces and Indian States in touch with each other.

Until and unless the milking qualities of our Indian breeds can be improved by selection, it will be difficult, if not impossible, to make cattle breeding pay, except in backward tracts where grazing is cheap and plentiful. There is no reason why draught and milking qualities should not be combined in the same breed. This aim is in fact now constantly kept in view by agricultural departments, and efforts are being made in several provinces to evolve dual-purpose breeds by selective breeding and cross breeding or both. The Thar Parkar breed the improvement of which has been taken up by the Imperial Department of Agriculture and the Nellore breed which is receiving the attention of the Madras Agricultural Department are examples of potential dual-purpose breeds, the improvement of which may go far to solve the draught and milk problem in this country.

THE MILK PROBLEM.

The milk problem in this country is bristling with difficulties. The problem is being now studied by a small but well trained band of enthusiastic Government officials; but though the harvest is ready, the workers are few. Milk in our cities is not only dear but of very poor quality. The supply is far short of the demand and infantile mortality is deplorably high. Rural areas are being drained of their milch cows and buffaloes which are not given a chance by the town *gaolie* of propagating their kind; for thousands of these good milch animals are being slaughtered every year because it does not pay the owners to feed them when they are dry. This drain on the milch stock of rural areas is forcing up the price of milk and the products both in urban and rural areas. The milk problem can, we believe, be solved only by producing

milk in rural areas where cattle food is relatively cheap and transporting it to urban centres by rail or road. This, however, will never be done very successfully so long as the industry remains entirely in the hands of those more or less illiterate *gaolies* who control it at present and who are not capable of organizing any such system of milk production and distribution. With a view to demonstrating the possibilities of transporting milk from rural areas where it is relatively cheap to urban centres where it is dear, milk is now being supplied daily from Pusa to Muzaffarpur a distance of 22 miles. In Bengal the Cooperative department has successfully organised at Calcutta the sale of milk produced in villages in the surrounding districts. An up-to-date sterilizing plant has been set up on the Imperial Cattle Breeding and Dairy farm at Karnal in the Punjab and sterilized milk is now being sent from there to Calcutta a distance of over 1000 miles. Should these and other experiments now under trial prove a success and capable of expansion they will open up a vista of great possibilities for the dairy industry in India; for milk costs about three times as much as in our larger towns as it does in rural areas within easy reach of these towns. The Imperial Dairy Expert is giving valuable assistance in preparing dairy schemes suitable for urban centres and the Imperial Dairy farms at Bangalore and Wellington are being run as model farms of their kind.

MISDIRECTED AGITATION.

There has long been an agitation against the slaughter of cows, but the agitators, unfortunately, have failed to face the real problem which is an economic one. They would for religious reasons prevent the slaughter of cows even though the owner suffered financially in consequence; to solve the problems on practical lines they have up to date made no serious attempt. The department of agriculture is tackling the problem in the only way it can be tackled with any hope of success, by training young Indians in science and technique of animal husbandry and dairying and by demonstrating how the milk required by urban centres can be produced under sanitary conditions in rural areas. When produced in such areas it pays to retain the cows when they go dry and to have them served by a bull of good milk pedigree.

The steps now being taken by Government to develop the industry are already beginning to bear fruit. Some of the Provincial departments of agriculture have started Dairy Farms where milch breeds of cows and buffaloes are being graded up by the selective methods I have described. The demands for bulls of good pedigree are increasing year by year, though the purchaser has at times to rail them hundreds of miles; for our cattle breeding and dairy farms are still few and far between. The demand for training animal husbandry and dairying is also increasing, but the facilities for giving this training are very limited. This is not as it ought to be; but it is a state of affairs which is likely to continue until Government is in a position to increase its staff and the number of its farms and to provide the necessary facilities for training men in the theory and practice of cattle-breeding and dairying. It is certain that the *garlies* as a class are quite incapable of developing the industry; for they lack knowledge: they lack enterprise and they lack capital. The steps already taken by Government to foster the industry have been the means of stimulating the interest of some of the educated classes in its advancement. A few of our landowners already have their breeding farms; many more have had their interest in the subject awakened and will in course of time follow suit.

PIONEER WORK BY THE GOVERNMENT.

The Department of Agriculture is in short trying to solve the cattle-breeding problems in the only way it can be solved, namely, on scientific lines. In the provinces and the Indian States all the distinct breeds are being improved on Government cattle-breeding farms by selection, cross-breeding and better feeding. Improved bulls are being supplied for stud purpose and now fodder crops are being brought to the notice of the people interested in cattle-rearing. Methods of storing fodder both as silage and in the dry state are being demonstrated and lectures illustrated by lantern slides are being given with a view to stimulating the interest of the people concerned in the improvement of their cattle. At Pusa pioneer work is being done in the same direction by preparing cinema films to illustrate the processes involved in the better breeding and feeding of milch kine. Animal husbandry as a scientific study is but in its infancy in India; but within the last

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20 years cattle breeding and dairy problems the existence of which was hardly realized 30 years ago are to-day the subject of experiment and speculation. To focus the attention of our experts on the work which is being done in this direction in the different parts of India a Cattle Conference is to be held annually in future. At this conference ways and means of developing cattle-breeding and dairying will be discussed and recommendations made as to the policy to be pursued. Progress must needs be slow, for our leading landowners take but little personal interest in animal husbandry and the smaller cultivators are not in a position to do much towards its development. It is hoped that the training now being given at our Agricultural Colleges and at the Institute of Animal Husbandry and Dairying at Bangalore will in course of time tend to break down the apathy of India's landed aristocracy and that their sons who are now undergoing courses of training will play the part which our "gentlemen" farmers have always played in England as leaders in the field of animal husbandry and dairying;—("The Planters' Journal and Agriculturist" Vol: III, No. I.)

The Physical Basis of Heredity.

By A. D. B. SMITH, B. Sc.

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A great deal is known about the behaviour of heredity characters and the manner in which they are inherited. Take the example of a cross between a red cow and a black bull. All the progeny are black. By mating two of these we get a generation consisting of three black to one red; to account for this, it is suggested that two factors in the germplasm acting together form a character. The original red cow had two for red and the black bull had two for black. Now, no individual can have more than two, and each parent contributes equally to the breeding (genetic) composition of the offspring. Therefore, one factor goes from each parent. The factor for black, however, dominates that for red, and the animal appears black. Its breeding composition is not like that of its black father, but is mixed, having one factor for red and another for black. And so, if you mate two such animals together, you get appearing in the third generation, 3 black, only one of which has both factors for black and will breed true, the others