One such deviation from the typical form has been observed on the Paddy Breeding Station, Aduturai. In the panicle, which consists of spikelets, some of the spikelet or spikelets in a branch are compressed and become transformed into a bunch of leaves (vide photo No. 1). On observation it was noticed to be composed of a short compressed disclike stem, just as in the paddy seedling, with minute roots just starting from it. To know whether this will behave as a separate plant by itself, it was removed from the head in which it was noticed, and planted in a pot. It grew giving forth more leaves and finally produced an earhead. Photo No. 2 represents two plants grown from such monstrosities which were collected in a progeny of a natural cross in the Paddy Breeding Station, Aduturai. It is evidently a case resembling bulbil formation which has been observed in many monocotyledons.

EXTRACTS.

THE ECONOMICS OF THE CATTLE PROBLEM.

https://doi.org/10.29321/MAJ.10.A01359

By

K. C. Ramakrishnan M. A.

India has the reputation of maintaining the largest number of cattle in the world, though in respect of the number of cattle per head of population she lags behind new countries like the United States, Canada and the Argentine, and old ones which have specialised in animal husbandry, like Denmark and Holland. In cattle, as in other things, India's superiority seems to lie in quantity and not in quality. The singing of the glories of a few fine breeds like the Amrit Mahal, Kankrej, Gir, Sindhi, Ongole and Kangayam—to maintain or improve whose quality as draught or milking animals little organised effort had been put forth until recently—cannot cover the sins of multitudes of miserable mongrels seen all over the country. Our average bullock is a poor draught animal, an impediment to the introduction of improved implements. Our average cow is a very poor milker, giving, according to an authoritative estimate made a few years ago in our Presidency, a net return of 4 pies per day.

It is not commonly recognised that for the available pasture far too many cattle are kept, and there are still some owners of large herds of cattle who seem to revel in mere numbers—reminiscent of the pastoral stage of rural economy when property was counted in terms of cattle. The shrinkage of pasture due to the

growth of populations and the expansion of arable land is not peculiar to India; it has been the inevitable fate of all countries where population has multiplied without restriction, and other means of subsistence than agriculture have not kept pace with the increase of numbers. The Japanese and Chinese (to whom in particular the above statement applies) have been obliged to get on with next to no cattle, as there is little land to spare for these. Indeed in these countries the human population has crowded out the bovine. They cultivate their tiny holdings, not with ploughs, but with hand-spade and hoe, and, far from demanding milk and milk products for consumption, they are said to consider these 'ideal' foods positively disgusting, while they indulge in a large variety of animal dishes far less costly to produce.

The wisdom of restricting the number of cattle to the limits which pasture or available fodder or feeding stuff would permit is but very slowly dawning on India. There has not been much deliberate contraction of cattle, though epidemics and starvation have been acting as positive checks. Overstocking of the remnants of common pastures is the rule and the evil is not confined to under-feeding. We keep on so many decrepit and diseased old cattle which not only share the feed that should go entirely to the efficient ones, but offer a fertile field for the spread of epidemics and, if not sterilised, are agencies in the deterioration of breeds. In no other country would their existence be tolerated for a day. A drastic disposal of the diseased has for long been the rule in Western countries, as may, for instance, be evidenced by the rigour with which the Contagious Diseases Act is enforced in England.

Improvement of live-stock, unlike that of machinery where the old may be scrapped and the new substituted, is possible only by the selection of the best from among the existing animals and a ruthless elimination of the unfit. Our religious sentiment is outraged by the suggestion of the slaughter of the weak or inefficient, though a slow torture by continuous starvation on what are euphemistically called pasture grounds, though they are very often standing or starving grounds, is not so shocking. Near cities and towns having a large Muhammadan population it is not an uncommon thing to see in the Shandies old animals being sold away by Hindu ryots for less than Rs. 10 each. In the West, however, cattle are now seldom slaughtered because they are old or weak; they are in fact not allowed to live so long. In countries

like France and Holland, in parts of which bullocks are still used as draught animals, they are broken to work fairly young, worked for a few years and then fattened off for beef. The economic calculations by which cattle breeding and rearing are now guided in America and Germany appear indeed gruesome to a Hindu mind. Cattle of both sexes are considered as machines whose business it is to convert the cheap grains and the inedible products of the farm into consumable commodities, milk or beef. When they begin to yield diminishing returns, *i.e.*, when the additional quantities of feed that they necessarily require as they grow in years begin to result in proportionately smaller increase of milk yield or beef-laying-on, they are considered fit for the butcher's knife; and this accounts for the development of the 'baby-beef industry' in those countries.

This certainly cannot be an ideal for Hindu India. Apart from the staggering affront it would mean to our religion, it is doubtful if from the economic and dietetic points of view a densely populated tropical country like ours would be wise in taking to beef which is more costly to raise than many nutritious vegetable foods. Milk, however, is much cheaper to produce than meat and it ought to be a welcome addition to balance the diet of a predominantly vegetarian nation like ours. And we want, in this country of small fragmented holdings, bullocks for draught purposes, though their number might well be restricted in view of the existence of many tiny holdings and the scope that lies for the introduction of heavier machinery on the bigger farms.

Most of our famous breeds are noted either for milk or for draught and not for both purpose, thus rendering cattle rearing more uneconomic than it need be. The great majority of fine breeds are noted for draught and the cows of such breeds are kept by ryots not for milk but as breeders of draught bullocks. Milk has been practically bred out of them. The cow calves are usually neglected by ryots while the bull calves are pampered. The opposite is the case with buffaloes, kept much more for milk than for draught; the milking animals and heifers are well looked after and the males are deliberately neglected. The cultivators as a class do not sufficiently feed the cows which yield little or no milk, and the non-cultivating classes who keep cows for milk leave little for the calves of either sex which naturally get stunted and become poor breeders or milkers or workers. It is forgotton in all these cases that an animal is an organism that at no stage in its life should be starved or ill-cared for.

If cows could be made to yield more milk in addition to being breeders, and if male buffalos could be used for heavy draught of short lead, wherever power more than speed is required, as in the case of sugarcane crushing and carting timber from forests, far more gain would accrue from cattle rearing as all breeds would then serve dual purposes. From the point of view of pure economics, there is no gainsaying the fact that if these animals, after being used for the dual purposes of draught and milk, could at a certain stage be fattened off for beef as in France, the cattle business would be even more paying. The great wrong, however, that is done by the sacrifice of the cow at the prime of her productive period either for a religious purpose by the Muhammadans or as a method of disposal of an animal which is felt by the *goalu* to be costly to maintain in her dry season, should be stopped. But if slaughter for any purpose at any stage is repugnant to the Hindu mind and to that extent we are prepared to sacrifice our economic interests, it is up to us, at any sate, to sterilise and segregate the old, the weak and the inefficient animals and to prevent them from breeding or even mixing with the better ones. In Western India a favourite form of charity is the maintenance of the inefficient in *Pinjrapoles*, though some of these are not well conducted. This is a compromise, though a costly one, which the rest of Hindu India should be prepared to adopt. Let us not in the name of humanity let loose the weak and the inefficient to graze along with the healthy and efficient ones, for all efforts at improvement of live stock may thereby be neutralised.

The truth that communal grazing leads to degenerate breeding has not been burnt into the minds of our cattle breeders and rearers. Breeding is done in a haphazard fashion in most tracts, while the facilities that some primitive professional breeders enjoyed are fast dwindling. Private enclosed pastures, the separation of the sexes and the weeding out of the unfit are rare exceptions. In our Presidency Kangayam is the only tract where these practices obtain and naturally the best draught animals come from that source. In the Nellore tract far less care is taken and the dedication of the Brahmini bulls is no longer a dependable factor in the breeding of cattle. It is the clear duty of the Government Livestock Department not only to evolve dual purpose animals but to supply a large number of breeding bulls to the ryots whom it believes it can persuade to adopt the best methods of animal husbandry. In the face of the reckless practices that prevail, improvement in the quality of our cattle can only be a very slow process.

Meanwhile the fodder scarcity is assuming alarming proportions. The area of 'pasture is not likely to expand in this country unless it be that more forest areas, not bearing or capable of bearing valuable timber and lying in the neighbourhood of villages, are handed over to Forest Panchayats which may be trusted to regulate grazing and limit the number of animals to the available pasture. It is also possible to raise fodder crops in a system of rotation with food or commercial crops. It is not easy to what extent the advice of Mr. Galletti, I. C. S., given in the columns of the *Statesman* in 1926, that Indian royts should imitate the Italian cultivators who devote a large proportion of their lands to leguminous fodder crops can be followed, as the compensation in the increased yield per acre of food crops as against the diminution in the area under food crops, is not yet a calculable factor. What is gain to the animals may be an unbearable loss to man in this densely-peopled land. But a good deal of fodder that is now wasted or ill-utilised on fields and in forests may be conserved by ensilage. Stall-feeding of superior dairy cows will have also to be resorted, to a much greater extent as in Denmark, Holland and Egypt which import large quantities of wheat bran, oilcakes etc., while such feeding stuffs are increasingly exported from this country, saddled, as it is with a large number of ill-nourished cattle.

The problem of the supply of milk and milk products in cities, and even in villages, is growing very serious. Good milk and butter are nearly as dear in our cities as in London and New York. Here is a statement of Mr. Smith, Imperial Dairy Expert: "The milk supply of India today is indescribably bad; it is filthy, expensive and scarce. No wonder the infant mortality in some of our large cities equals 666 per 1000 infants from birth to one year old." To take up the economic aspect alone, the supply of both milk and ghee is far short of the demand. But there is little demand for pure milk or ghee at a price which would attract the producer. Hence the futility of Adulteration Acts which seem to work more on paper than on milk or ghee. The undisguised watering of milk and the roaring trade in 'ghee mixtures' are bound to continue as long as the dairy industry is a bankrupt one —as it has been pronounced to be, by Mr. Carruth, in the city of Madras which imports the best milking breed of the Presidency. The fact is that the cow of even our best breed is a poor milk yielder compared to the cows of the West and is not worth the

keep at its present rate of yield in a densely peopled tract. Cross bred cows are better yielders but they are more susceptible to disease and the cross bred bulls are no good for draught.

The improvement of the breed of milch cattle by selective and cross breeding from among the best indigenous animals is the *sine qua non* of any satisfactory solution of the milk and the ghee problem though better feeding and housing would contribute their share. But such an improvement cannot hang by itself, if cattle breeding and rearing should be an profitable industry. The power of the draught animals should be improved along with the yield of milch cows. It is to the evolution of such dual purpose animals—cows rich in milk, and oxen strong in muscle—that all the efforts of live-stock experts should be devoted; and the fodder question should be tackled by the agricultural experts. Without a bold and comprehensive policy of breeding and rearing only finer cattle, and the gradual restriction of the number of cattle to the requirements of agriculture and the limits set by the extent of pasture available and the fodder that can be conserved and multiplied the cattle industry is bound to continue in its present unfortunate position. This has been aphoristically summed up by the late Sir Ganga Ram, a member of the Royal Commission on Agriculture in India, when he was examining Mr. Bruen, the Live-stock Expert of the Bombay Presidency :-

Sir Ganga Ram : In the cattle business cattle-lifting pays better than cattle breeding ?

Mr. Bruen : That is so !

Sri Minakshi College Miscellany.

Differential response of Barley varieties to manuring.

By selection or hybridisation, varieties of any one plant can be produced which differ markedly in their yielding capacity. Although yielding capacity of plants is controllable by manuring, it is not known whether the increase in yield gained in this way is a function only of the manure added, or whether different varieties respond to varying extent to the manurial combinations given. Interesting results were obtained in the experiment with five varieties of barley. Eleven manurial combinations consisting of of different amounts of phosphate, nitrogen and potash were used. The experiments were done in pot culture using pure and sand solution of pure chemicals.

Varietal differences in response were apparent in all the types of manuring. The effect of immediate interest here is the differential varietial response with the different manures. It is seen that for any one pair of a varieties the relative magnitude of yield differs in an orderly way with the manuring; thus where a significant increase of the first variety over the second was obtained in the phosphate-deficient combinations, the order is reversed in the potash deficient sets and so on. Furthermore even when no significant differences are found with complete manures such differences show themselves in the partially deficient sets.

A difference in efficiency in the use of manures is established and it is further seen that for different varieties tested over the same range of manurial combinations, it is not always the same manurial constituent which in minimum has the most marked effect on relative yield. The agricultural bearings of the results obtained are twofold (1) varietial trials must be combined with manurial trials to be complete and (2) the lines along which to develop selection and breeding of varieties to meet the requirements of different soil types are indicated.

—(From "Nature" dated 28th January 1928.)

DESTRUCTIVE INSECTS AND PESTS ACT, 1927.

(of England.)

This Act, which received the Royal Assent on December 22, 1927, amends the earlier Acts of 1877 and 1907. This Act of 1877 which was passed at a time when the Colorado Beetle was sweeping across the North American Continent, enabled the Privy Council to make Orders for the prevention of the introduction of the Beetle, and its spread in Great Britain. It empowered the Privy Council to require Local Authorities to carry out any Orders issued by the Council, and to pay compensation for any crops destroyed under those Orders. The Act of 1907 extended the 1877 Act to include other insect and fungus pests.

The 1927 Act enables the Ministry's officers to take the urgent action which would be necessary if a new and dangerous pest were discovered, and extends the definition of "insect" in the original Act so as to include "bacteria and other vegetable or animal organisms and any agent causative of a transmissible crop disease." This provision will enable the Ministry to take action against "Virus" diseases, such as Mosaic and Leaf Roll of