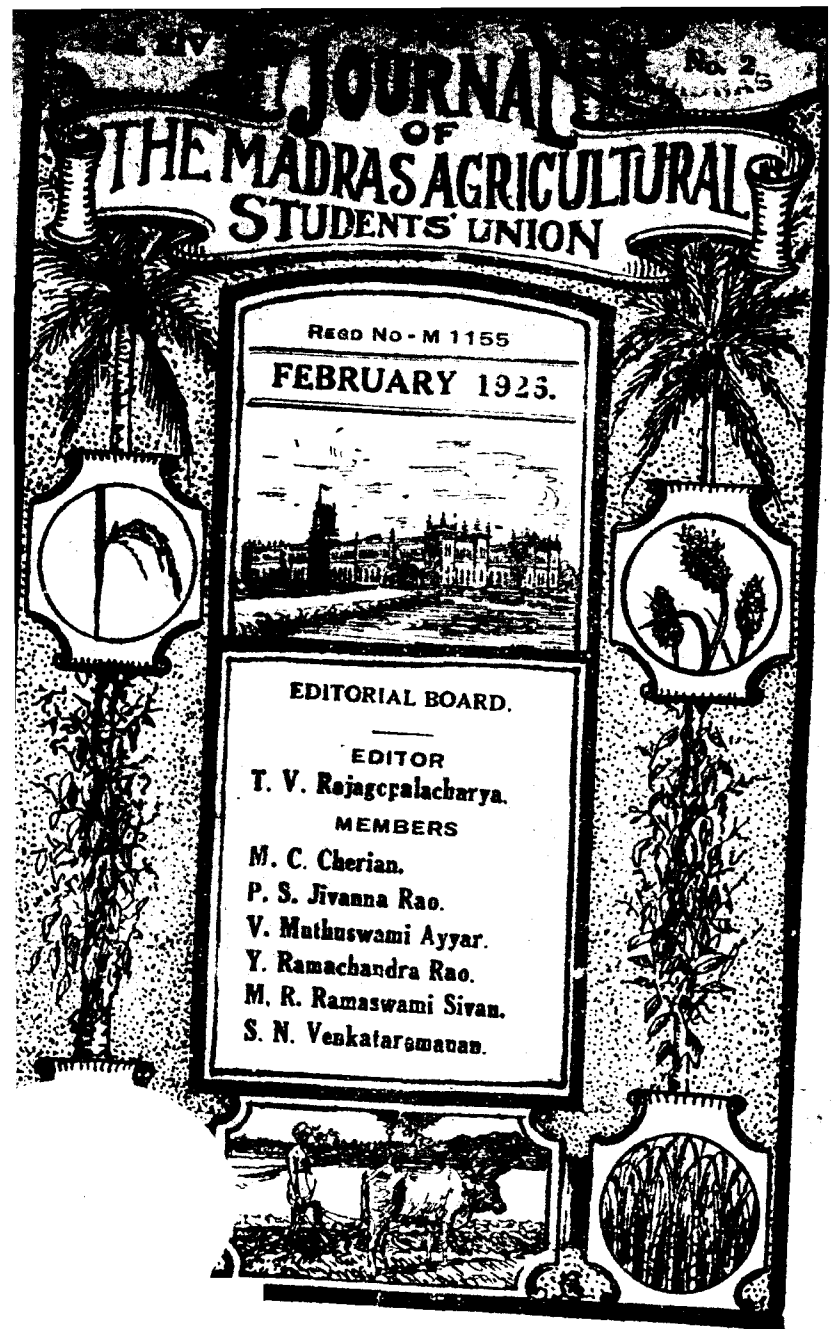
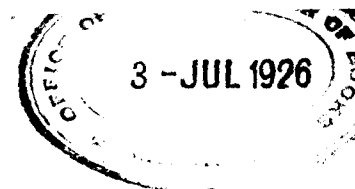






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The Madras Agricultural Students' Union.

FEBRUARY—1926.

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Farming will never be a success unless the farmer had more voice in the disposal of his produce—P. Merrel.

THE JOURNAL
OF
The Madras Agricultural Students' Union.

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A few of Nature's Enigmas in Crop Production.*

D. BALAKRISHNAMURTHI.

My claim for bringing this subject before the Agricultural Section of this Congress is based on my intimate contact with land for over a generation and my knowledge of the perplexities, cropping on several occasions gives rise to. My sole object is to obtain a solution for the problems with a view to a correct understanding of the underlying principles for adequate crop production.

2. Most of the crops in the Presidency of Madras, where my sphere of activity lies, are raised in two well marked seasons—the rains and the cold weather, almost corresponding to the *Kharif* and *Rabi* in Northern Provinces. The number of kinds does not exceed 40, though the varieties are legion. Several factors affecting their growth may be stated to be, heat, humidity, wind and rain. It is a familiar cry of the financier that the failure of the monsoon brings on scarcity, if not, famine. This shows the seriousness attending crop reduction in any one year. One who is interested in the raising of crops ought to be conversant with the conditions above named, and their variation, as obtaining in a particular locality where he wishes to raise crops of his choice.

* A paper read at the Indian Science Congress in 1925.

3. All land comprised within the limits of this Province may, broadly speaking, be divided into 3—4 relatively well-defined regions.

The long and narrow strip between the Western Ghats and the Arabian sea, which is mostly derived from laterite, is characterised by plants which thrive under very warm and humid conditions. Here the summer is very intense and is associated with the fall, in enormous quantities, of rain, which "not quenches but inebriates". Extreme humidity, very heavy rains, with intermittent spells of bright sunshine favor perennial crops like the coconut, the arecanut and the pepper. Paddy brings joy to the agriculturist only through sufferance of the rain God Varuna. The stately jack, the dwarf pine apple and the coveted mango revel amidst perennial forest conditions. The semi-arid tapioca yields a certain but indifferent food. The delicious banana meets your eyes in every nook and corner.

The second region, which forms the southern portion of the table-land of the Deccan, is identified with its inadequate and uncertain rainfall. High temperatures are the rule, as high as 127° F. being registered in the shade in a few places, resulting in several deaths by sunstroke and heavy infant mortality. Unbearable heat, stillness of the atmosphere, rarity of moisture-loving plants, presence of shortlived vegetation and quick-maturing crops and varieties distinguish this region. Cholan and castor, cotton and tenai, Bengal gram, groundnut and safflower are the favourite crops. The good depth of black soil often untouched by sharp showers keeps the cultivator steadily at work throughout dry weather. Harvest of main crops does not mark the end of the ryot's toil for the year but only indicates a trend in the direction of his activities which find a concrete expression in the culture of cotton and collection of the creamwhite pellets of kappas that keeps millions of spindles and looms in lands distant and near busy going. It is in this tract that the peasant has studied Nature in minutest detail, evolved a type of implements and tools, simple, cheap and most efficient and perfected a system of cultivation and varieties of crops, to the admiration of the modern agricultural scientist and long before the birth of "Dry Farming" in the western states of the central portions of North America. Mark, here the semi-aquatic paddy is absent.

The third region is the region of deltas, i. e., lands at the mouths of several rivers, of which the chief are the Godavari, the Kistna, and the Cauvery. These deltas, formed as they are, by heavy deposits of silt washed down by the rivers from the hills raise abundant paddy crops mostly planted with the help of the South West Monsoon but

maturing under the beneficent influence of the North East Monsoon rains. These deltas are dead level plains with little slope and insufficient drainage. The staple crop is paddy which is grown and matures when temperatures are pretty high. Pronounced cold or a distinct fall in temperature kills the plant, as in Godavari where the thrifty ryot would even witness the refreshing waters of the river run down to the sea rather than utilise them for raising a second crop of paddy in December. He deliberately postpones planting to a later day, in January—February, until better weather, locally termed Pyru Gali (South wind), sets in. This wind dries up the landsurface quickly and brings vigour to the crops growing, unlike the cold North East winds which had been blowing three months and cease about this time.

Tracts of an intermediate nature are found forming portions of the Circars and parts of the Central and Southern districts. In the former, conditions noted as prevalent on the West Coast exist in a more moderate degree and cropping is done under systems which would, elsewhere, excite ridicule or bring ruin to the cultivator. As instances, may be mentioned the transplanting (dry) of cereals like cumbu, cholam and ragi, and the raising of sweet potato without irrigation. Growing of cotton in summer and in lands which have carried a crop of paddy, to be allowed to mature and to be pulled out before another paddy crop comes on, is an experience, I suppose, new to very many of you present here.

In the latter sub-divisional tract named, dry and wet crops are a fair mixture with other crops, yield of which is assured by a varying supply of water obtainable at low or great depths in the bosom of the earth and occasionally from tanks. Utilisation of such resources however is made for the culture of crops which either require few waterings when raised in summer or the supply of moisture to which, is supplemented by rains which are general during the period of their growth. Crops under this head are groundnut, tobacco, hotweather sorghums, cambodia cotton, sugarcane and certain forms of paddy.

4. In the several tracts referred to, types of crops grown are distinct, such distinctions having arisen as the result of unvaried growth for very many decades under two different sets of conditions, seasonal or cultural. For generations, the environment has been kept scrupulously different, one set from the other and the crops have been raised for such a great length of time that they have come to assume different characters so as to be designated distinct types; may be, one is dry, the other irrigated. The one cannot be and never is cultivated at the same time as or in the same field with, the other.

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One is designated a rainy weather crop, a second is termed a dry weather variety, a third is designated a wet land crop while a fourth is associated with dry land alone.

5. The general considerations apart, problems of a purely local nature often arise.

6. It is the unrecorded experience of observant ryots in Madras that there is a definite correlation between the nature and magnitude of fruiting of certain plants and the conditions prevailing in particular periods of the year. For example, any paddy variety planted in June is characterised by undue vegetative growth and comes to maturity only at the sametime as the same variety planted in August. Similarly canes planted in January in certain parts grow for full 14 months while the same varieties mature in 8 to 9 months when planted 3 to 4 months later. But the fruiting capacity of a variety does not show itself when the period of planting to which it is adopted is past. Either this quality beomes suppressed altogether, or the vegetative characters develop at the expense of fruiting, as the result of which the whole crop turns into leaf. Planting or sowing of field crops after a particular date nearer their regular flowering season ends in poor growth or wholesale failure of the crops. Even extra manuring and closer planting do not raise the yield sufficiently higher to compensate for the loss due to late planting. This is well understood by growers. Hence the extreme anxiety of the ryot to plant his crop as early as possible in the season, in order to get maximum grain yields. Experiments with paddy on the Samalkota Farm have confirmed the correctness of this view.

7. Further, the seasons of fruiting are not the same for all kinds of plants. Some flower only in one season, some in the second season and others twice in the year, yet others throughout. The mango and the jack fruit in summer, the orange, in November, certain paddies like Rasangi mature in October, a few like Konamani, in December, yet others like Dalawa, in May. The raintree pods in September and in March. In this part of India at any rate ragi has shown more adaptability so much so that it is grown throughout the year. Maize and Garikasannavari paddy are similarly not confined to any one particular season. Such cosmopolitan character found in certain crops would be welcome in others also.

8. The vegetative characters of plants have received prominent attention at the hands of a few growers and this accounts for the supply of the class of vegetables, known as greens, at all times of the year.

9. A few other observations are the following:—

Kishu, a long term paddy in Japan matured in less than 3 months in the climate of Coimbatore. So also Rasangi paddy, a five months' variety of Godavari became lengthened in its period of growth, while long term konamani and turupu samia akkulu became short termed. Seeds of Garikasannavari which is a hot weather paddy, do not yield a good crop when sown in the same season a year after. Heavy yields are obtained only when seeds are saved from the crop planted in the main season for this purpose.

In the Vizagapatam District, there are distinct seasonal varieties of ragi, gingelly etc.

In Tinnevely, spiked millet is grown on dry lands in October—November and the variety is noted for its thickness of husk, and is termed a dry land variety. Another variety is raised under irrigation but in dry weather. If this is sown on dry lands it yields no grain. Further the same crops yield very poor returns if at the time of flowering winds are not brisk.

In Bellary, ryots distinguish two classes of sorghums, grain sorghums and sweet sorghums. The latter are raised in cold weather and the dry cold condition of the season seems to have contributed to the development in the sorghums growing in that season, the sweet character not pronounced in the other class of sorghums. In the same way fruits like mangoes and pine apples produced in summer are of superior quality. It is common knowledge that copious waterings or rains turn them sour lowering their quality.

For fodder purpose, cholam and cumbu are sown out of their proper season for grain. Similarly sunnhemp (*Crotolaria juncea*) and Teegapesalu (a *Phaseolus* variety) when intended for green manure purposes are grown in April-May. This is why Gogu (*Hibiscus cannabinus*) is started early in April-May in Vizagapatam after the first mango showers. A longer period ensures more growth which is a desired character in a fibre crop.

10. The several illustrations given above indicate the desire of the ryot to grow his crops at different purposes. He has come to posses the knowledge that there is a definite period at which crops mature at whatever intervals they may be planted. Animal life in the lower orders of creation also seems to suffer from a like defect. It would be well if this learned body would be provoked into thinking of the ways and means of analysing the factors at work so as to enable agriculturists to vary their methods for more varied and increased crop production which is becoming a very acute problem all over the world at the present day.

EXTRACTS

Cattle Breeding and Dairy Industry in India.
Activities of the Government Agricultural Department.

DR. D. CLOUSTON C.I.E.M.A., D.S.C.,

Agricultural Adviser to the Government of India.

Departments of Agriculture in India realise that the condition of the cattle in this country is one of the most potent factors affecting the development of agriculture. With the great increase in population which has taken place within the last 50 years the pressure on the land has also increased, and much land, previously available for grazing, has been brought under the plough. Large areas of culturable waste which once supported breeding are now producing aricultural crops some of which provide nothing in the way of food for cattle. The cattle in their dumb contentment have fared rather badly; their claims have found but few sound advocates. In the past, cattle owners relied on Nature to produce sufficient grazing for their herds; grazing areas, however, are being greatly reduced in size and no serious attempt has yet been made to provide a substitute by growing fodder crops. Until the cattle owner learns to readjust his farming policy to the new economic conditions which have arisen, the tendency will be for his draught and milch cattle to deteriorate owing to lack of sufficient food. Poor cattle result in a low standard of tillage; a low standard of tillage results in poor yields of such fodder crops as are grown, and a low yield of fodder in turn results in cattle being under-fed and in there being less cattle manure available for fertilizing the land. Agriculture in this country is thus moving in a vicious circle which makes rapid progress both in cattle-breeding and crop production impossible.

In the matter of cattle improvement India is passing through a phase similar to that which prevailed in England about the middle of the 18th century but with this difference; in England the improvement of cattle by selective breeding was initiated at that time by "gentlemen" farmers, while in India it is being done by Government

"GENTLEMEN" FARMERS IN ENGLAND.

In England these "gentlemen" farmers were the first to rise to the occasion and to read just their system of farming to the needs of the country. The Industrial revolution of the 18th century and the great increase in the urban population resulting from that revolution necessitated such a readjustment. The ever increasing demand of the growing population for more food was at least partly met by the improved system of agriculture which these "gentlemen" farmers devised. Holdings were consolidated; the rotation of crops was practised, fodder crops such as roots, grasses and clovers introduced, better varieties of the staple crops were evolved by selections; labour saving machines were invented and used and the cattle of the country improved by selection; cross-breeding, better-feeding and housing. All this was done by these leading farmers themselves and on their own initiative for their government had not as yet realised the importance of scientific agriculture and of providing for scientific research and experiment. By their efforts breeds of cattle, sheep and herds were evolved which gained world-wide fame; England in course of time became the stud farm of the rest of the world.

But in India the problem of cattle improvement is infinitely more difficult than it was in England in those days. In India the holdings in the 700,000 odd villages are mostly very small and consolidation is an almost impossible problem. The number of cattle including buffaloes in these 700,000 odd villages is about 179,170,000. They graze on grazing grounds common to the whole village and promiscuous breeding is the order of the day. The landed aristocracy in India, moreover have not as yet taken a lead in developing animal husbandry. Such work as has been accomplished in this direction up-to-date has been done by Government working through the officers attached to Military Dairy Farms and Departments of Agriculture controlled by the Imperial and Provincial Governments and by Indian States. The work done on Military Dairy farms has been particularly valuable though it has not perhaps struck the imagination of the public for the reason that no attempt has been made to advertise the results obtained.

APATHY OF THE INDIAN LAND-OWNERS.

The subject of cattle breeding and dairying was discussed by the Board of Agriculture in 1913, 1916, 1922, 1924 and again at the meeting of the Board held at Pusa last month. A perusal of the proceedings of the Board for these years will show that a definite policy has been laid down for the guidance of the Imperial and Provincial Departments of Agriculture and for Indian States which have their own

Agricultural Departments. Effect is gradually being given to that policy with ever-increasing success. But progress in cattle-breeding and dairying as in other branches of husbandry has been handicapped by lack of staff and funds and by the apathy of the landed aristocracy in this country. Despite these handicaps the results have been most encouraging. To those impatient critics who say that more might well have been done, I should like to say that it takes many years to establish pure—bred herds from among the heterogeneous mass of mongrel cattle which one finds in India. Nature cannot be hustled; it takes many years of careful patient work to breed out the defects of centuries of cross-breeding and in-breeding; and this must be done when laying the foundations of improved pure-bred herds. Pure bred herds are being established on Government farms and on some farms very definite pedigree types have been fixed, but the efforts of Government will be of little avail until and unless the land-owners in this country play a much more important part than they have played in the past in taking advantage of the facilities provided for them on Government cattle-breeding farms for the improvement of their live-stock.

The foundation of distinct breeds is now being laid by Agricultural Departments and improvement is being effected in breeds by selective breeding, crossing, better feeding and housing. In this way the milk yield of the herd of Saniwal or Montgomery cows on the Pusa Farm has been almost doubled within the last 10 years. Several of these cows have given over 6000 lb. of milk in a lactation period while one of the cross-breed Montgomery Saniwal cows has given over 12,000 lb. which is about 12 times the yield ordinarily obtained from the draught breeds of this country. In years to come breeders will, we hope, trace with pride the origin of their pedigree herds to the Pusa and other Government herds which are to be found in India to-day for from these herds bulls of good pedigree are already being supplied to cattle owners for stud purposes. In this work of cattle improvement the Veterinary Department is rendering valuable assistance. The excellent result obtained by the Imperial Veterinary Research Institute at Muktesar in the immunisation of herds against rinderpest by the simultaneous serum method of inoculation is worthy of special mention.

"SELECTIVE BREEDING"

The improved milch cows produced by selective breeding are in fact most profitable milk-producing machines. They give a big return on the cost of the food they consume, whereas the ordinary cow of a Gaolie's herd often fails to give enough milk to pay for her feed. We may take it that with milk at 10 lb per rupee the

Gaolie's best cows bring him a gross income of about Rs. 200 per head per annum, whereas cows of some of selected country breeds reared on Government farms have given yields worth Rs. 600 per annum and cross-breed cows have given yields worth Rs. 1,000 or even more.

Government cattle-breeding farms are sometimes thoughtlessly condemned because they are not self-supporting. Our critics forget, however, that until and unless our breeds of cattle are improved cattle rearing and dairying in this country will never pay as it ought to do. The task of remedying the defects of centuries must needs cost money and this money Government as well as enterprising land owners who take up this branch of animal husbandry must be prepared to sink in the industry in order to get more out of it. For a bull of a good milch pedigree they may not be able to get more than three or four hundred rupees, though the animal may be worth as many thousands. The people of this country do not as yet realise in short the value of pedigree and are not prepared to pay for in-bred qualities the value of which they do not realise. For these qualities cattle-breeders in more advanced countries pay large sums; pedigree bulls have fetched over a lakh of rupees in England. Purchasers pay such prices and get full value for their money. As the building up of pedigree is a slow and somewhat expensive process, the question of initial costs should under the circumstances be a secondary consideration seeing that the value of the improvement is insignificant as compared with the cost of effecting it.

(To be continued.)

(From Planters' Journal and Agriculturist January 1926.)

Large Estate Farming in the Punjab.

BY COL. C. N. FRENCH,

Assistant Director, Empire Cotton Growing Association.

The writer having had an opportunity of visiting two of the large estates in the Punjab, was much impressed with the value of the work done on them, both for the Agricultural department and for the cultivators not only on the actual estates, but in the whole irrigated area of the Punjab. In the short time available it was not possible to acquire more than a general knowledge of conditions and this paper has no pretension to be an exact and critical examination

of the Punjab tenant system of *batai*, which broadly speaking, is one where the tenants cultivate the land and get half the produce, the other half going to the landlord. It is a system which has been long accepted, and it is not a recent development arising from irrigation and canal colonies.

The Punjab is particularly well suited to large estate farming with tenant cultivators, during comparatively recent years, the Govt. have opened up, by irrigation, what was formerly almost uninhabited desert land and therefore have had at their disposal large areas with no inhabitants, no existing system of land tenure and no vested interests. This land it was necessary to dispose of, some was allotted as a free grant and reward for military or other service, some was leased on special terms mentioned hereafter but a very large proportion was sold to meet part of the capital expenditure of irrigation, and was acquired by these inhabitants of the Punjab who had the capital and the foresight to realize the possibilities of such land. A considerable portion of the irrigated area thus consists of fairly large holdings cultivated on the tenant system, and consequently the grant of a limited number of comparatively large estates leased on special terms and for specific purposes has in no way dislocated existing conditions.

The development of virgin land under new conditions necessitated much experimental work by the Agricultural department if the native landholders were to be guided as to the right crops to grow, suitable rotation, amount of water etc. Experimental agricultural work on a large scale, however, involves additional capital expenditure, and the visible returns on such Government farms are usually small, for which reasons the number and scope of them is bound to be limited. To supplement the work of such establishments as the Agricultural and Research College at Lyallpur, the Government of the Punjab decided to allot to individual concessionaires large grants of land on lease for specific purposes. The following are the areas and the purposes for which they are being worked at present.

Area in acres.	Purpose.
21,000	To produce fodder for the army.
14,000	Horse breeding.
2,000	Experiments in steam cultivation.
9,000	Cattle breeding.
3,000	Seed production for the Agricultural Department.
7,000	To encourage staple cotton growing, test varieties, establish a buying agency for long staple cotton, <i>et cetera</i> .

These estates are leased for private individuals, to Government departments, and in one case to a company. The conditions on which they are held are strictly laid down and scrupulously carried out. Practically all are worked on the tenant system of *batai* by which half the water-rate, the land revenue, and the taxes is paid by the landlord, the other half being paid by the tenant.

The advantages of such estates to the Government are, as has already been mentioned, that they are partly part of the Agricultural department with which the lessees co-operate closely and cordially, and that they serve as model farms which farmers can visit in order to see modern and progressive methods of farming and experiments carried out on a field scale. The lessees also act as additional and unofficial channels of communication between the department and the agriculturists, and, finally, the estates represent a large amount of capital expended for the development of the country without expense or risk to the Government.

The tenants on these estates are far better off than those working on the property of the ordinary landlord, many of whom are absentees, while few take much interest in the cultivation of their lands by the tenants. On the special concession estates agricultural methods, rotation, system of watering, &c., are organized and controlled by the lessee, with the result that the yields are higher and the waste of water and labour is less than elsewhere. The tenants need not sink capital in buying agricultural implements, but can hire the best and most suitable from the landlord, who buys, stores, and maintains them. Inequalities in the nature of the soil are minimized by periodic redistribution of the various rectangles (of 25 acres) so as to ensure that no tenant gets land of poor quality every year. On most estates well-planned villages and roads are made, trees are planted, and wells are sunk by the landlord and as a rule a small hospital is maintained. Each village is organized and self-contained, and has its own carpenter, blacksmith, potter, carrier and sweeper, and in many cases its own spinners and weavers.

The crops are sold in bulk, thus ensuring good prices and fair dealing. Above all, the tenants can obtain monetary advances from the landlord on account of their crops, and so are kept out of the hands of the money-lender and usurer, and are independent to a degree which is rare both in India and Africa; they also have a direct share and interest in the development of the estate, and prosper in proportion to its prosperity and success.

It is scarcely necessary to mention that the advantages are not all on the side of the Government and the tenants. During recent years the high prices of agricultural products and especially of

cotton, have ensured for the landlords a considerable reward for the work they have done and the capital they have sunk. It is desirable that this should be so, for the lessees have been led to find a large amount of capital and to take a certain amount of risk in developing their estates. Moreover, unless profits are reasonably high there is always a possibility that an unscrupulous landlord might supplement them at the expense of his tenants.

The foregoing notes will, it is hoped, be sufficient to explain the general principles of these large estates in the Punjab. To recapitulate, they have been created so far as the writer is able to judge for the following reasons:—

- (a) To assist the Government in developing the land.
- (b) To build up a strong unofficial section of the population which is in close touch with and to a large degree representative of the native agriculturists.
- (c) To assist the Agricultural Department in the solution of problems connected with scientific tropical agriculture.
- (d) To serve as model farms and object lessons to native agriculturists and to level up the agricultural practices of the province.
- (e) To raise capital for work which a Government cannot normally or conveniently carry out.
- (d) To trade on a large scale in agricultural produce and to encourage co-operation in trading among landlords and tenants.
- (g) To better the conditions of the native agriculturists to ensure that they get a fair return for their labour and to educate them to work in partnership with a benefit landlord.

In order to achieve these results it seems essential, firstly that the organizers and managers of these estates should be the lessees themselves and, if this is not possible, that they should be directly and personally concerned in their success by means of a bonus on results. If such estates were managed by paid agents there would be a danger of weakening the intimate personal touch between landlord and tenant, which is so marked a feature and which contributes so largely to the success of the estates visited by the writer. The second essential is that such estates should be as large as possible so as to ensure an adequate amount of capital. It is most desirable

when it is possible to do things on a big scale especially in Tropical Africa, when as is subsequently suggested cultivation is to be combined with a fight against the tsetse fly, which not only infests hundreds of square miles of bush, but is encroaching an area of country that has hitherto been free of this pest.

(From the Empire Cotton Growing Review No. 4 1925)

Some Physiological Aspects of Pruning.

BY CHEESEMAM, B. SC.

An annual plant starting from the seed, forms first a small root and then a small shoot, utilizing for the purpose the food stored in the seed, and proceeds to grow in both directions till it flowers, sets seed, and dies. During this life-history it nourishes itself from two sources from the soil by means of its roots, and from the air by means of its green parts. The nutritive substances obtained from these two sources are of two very different kinds, but both are necessary for growth. The roots take in water and mineral salts, among which the most important salts from our present point of view are nitrates, which are built up inside the plant into more complex nitrogenous substances, whilst the leaves take in carbon dioxide, from which they build up carbohydrates, such as sugar or starch.

In the ordinary course of events the growing point, or points supplied from both sources produce for a time stem and leaves, and then flowers appear. These may be borne in various ways; sometimes they remain unchanged and the flowers are borne laterally, but in either case growth slows down, because the food materials that were being used in growth are now diverted to flower production.

The reason for this more or less sudden change of behaviour on the part of the growing point—the change from vegetative growth to reproduction, has for long been one of the interesting problems of plant physiology, and we are now a little nearer to a solution than we were a few years ago. It seems clear that the change is largely determined by the relative amounts of the two classes of materials, carbohydrates and nitrogenous substances, which are received by the growing points from other parts of the plant.

The nitrogen supply determines the amount of vegetative growth; it is a well-known fact that plants liberally supplied with nitrogenous manures make vigorous leaf growth, but as long as the nitrogen supply is continued produce little fruit. The carbohydrate supply on the other hand, is directly dependent upon the growth, for the more the growth the larger the leaf area, and consequently the greater

the amount of sugar formed. If the nitrogen supply is altogether inadequate there will be few leaves and consequently little carbohydrates formed. Under the latter conditions a starved plant is the result, which has no reserves of materials with which to form either flowers or fruit in any quantity.

The usual condition is that the nitrogen supply is ample while the plant is young and gradually diminishes later as the roots exhaust the soil in their immediate neighbourhood and come into competition with those of other plants. Meanwhile the carbohydrate supply is gradually increasing as the leaf area increases, and when the ratio of carbohydrates to nitrogen, which is thus continually rising, reaches a certain point, the behaviour of the growing points is switched over, and flowers are produced. Production of the flowers, and ripening of the seeds uses up all the available food-materials leaving no reserve for future growth, and so the plant dies.

A perennial plant, such as a fruit tree, differs in that it takes longer, for constitutional reasons, to reach the flowering stage than the annual, and consequently has greater reserves at flowering time. In exceptional cases, such as those of the Talipot palm, Century plant, and some bamboos, these reserves are all used up in one burst of flowering, but in the vast majority of cases there is sufficient food material left to permit a resumption of growth after flowering, followed by a second period of reproduction later on and so on through many years.

On a perennial plant of this kind, each bud that develops usually goes through a life-cycle similar to that of the annual. At first it grows at the expense of the rest of the plant, forming its stem and leaves, as it leaves expand and begin to manufacture sugar it becomes independent for its carbohydrate supply, later on it pays back into the general stock, with interest, the sugar which it used in growth later still it usually has its blooming period and finally although it does not die, it becomes more or less dormant, and serves merely as a channel through which its daughter buds are in their turn supplied with the necessities for growth, and as a storehouse in which any surplus foodstuffs accumulate until such time as the growing buds or flowers on the younger shoots draw upon them.

In some cases, such as that of cocoa, there is a slight modification of this plan, in that the flowering period is delayed, and the flower-buds remain dormant until the stem on which they are borne has shed its leaves and passed over into the last stage. The flower clusters of cocoa are really reduced branches produced from such dormant buds,

Bearing these facts in mind we can see that although the effects of pruning upon a tree are likely to be different at different stages of the tree's life, the immediate result is in any case to check fruiting. There is always a certain amount of stored material in the branches and twigs removed, and in addition to this the operation reduces the heat-surface, with the inevitable result that carbohydrate manufacture is lessened. Since the important point is the balance between carbohydrate and nitrogen, this reduction is equivalent to an increase of nitrogen, and will be followed very quickly by increased vigour of growth and production of new leafy shoots.

It does not follow that since pruning checks fruiting it is necessarily undesirable,—the fact that the practice is kept up will alone serve to prove that point. In dealing with tree crops the agriculturist has to look well ahead. A young tree just coming into bearing may have its fruiting delayed for several seasons by pruning, and yet, making stronger growth than an unpruned tree which has been allowed to fruit early, may in the long run give a bigger yield.

Another point to be borne in mind is that pruning of young trees is more often directed to producing a tree of certain shape than to affecting immediate yield. The shape will ultimately affect the yield because many trees tend, if left to themselves, to become large masses of useless branches, with their productive part reduced to a mere shell on the outside. This means a waste of space, whereas if the trees are pruned and shaped a greater number can be grown to the acre. This is not a physiological question so much as a practical one, and the planter has to decide just how far it pays him to delay, and perhaps even to reduce, the fruitfulness of individual trees, in order to have them stronger and more efficiently spaced.

To return to our physiology, we have now to consider the effect of pruning an old tree. A tree which is not manured, or which is manured inadequately, gradually exhausts the nitrogen supply in the soil around its roots, and then begins to suffer from nitrogen starvation. Under these conditions both growth and fruitfulness are adversely affected. Heavy pruning, reducing the carbohydrate to a level equivalent to the small nitrogen supply, may cause a temporary improvement, but the best results will be obtained by moderate manuring coupled with pruning. The result of pruning in this case is to remove old moribund branches, causing the development in their place of vigorous new shoots, which are much more efficient as manufacturing organs than those removed. In this way the carbohydrate supply is very soon increased, and if the nitrogen supply is increased at the same time by manuring, the tree returns to a fruitful condition.

The physiological balance can be affected in the opposite direction by root-pruning. Often a tree which has been over-pruned or over manured gets into a condition of unfruitfulness coupled with vegetative growth due to excess nitrogen. In such a case root pruning, by curtailing the nitrogen supply, quickly restores fruitfulness, whereas in the case of the old tree suffering from nitrogen starvation the operation would obviously be worse than useless.

The work by which the importance of the carbohydrate nitrogen balance was first indicated was done by two American plant physiologists Kraus and Kraybill, who experimented with tomato plants growing under carefully regulated conditions. It was very soon followed by several investigations on apple trees, carried out by men who realised the immediate application of the principle to pruning. The result of all the work taken together is to show quite clearly that the principle is correct, but that at the same time a number of factors have to be taken into account whenever it is applied.

In the first place, the reverse materials in the tree vary from season to season so that pruning in one month is likely to remove more than pruning in another month, with consequently different results on later growth. The variation is probably less in our tropical crops than in a temperate tree such as the apple, which has well-marked resting period during the winter, but it almost certainly occurs to some extent.

In the second place, the flower-buds will be more affected by the disturbance due to pruning at one time during the course of their development than of another, and in the third place it has been found that a tree which is in ideal condition for producing flowers may not necessarily be in the best condition for setting and maturing fruit. For apples it seems that the fruit sets best when the nitrogen is relatively high. In the ordinary course, the process of flowering, which takes place when the carbohydrate supply is fairly high, itself uses up most of the carbohydrate, and so leaves the nitrogen content of the branches relatively high. Thus the right condition for fruit-setting is attained naturally, but pruning at the wrong time of the year may upset matters and seriously decrease the amount of fruit.

To sum up, the physiological reason for the effects of pruning is largely to be found in the fact that the balance of carbohydrates and nitrogenous substances in the plant is upset. This always (except in the case of root-pruning) leads first of all to an increase in vegetative growth at the expense of fruit-production. In the long run, however, fruit production is increased on account either of the extra strength or of the better shape of the tree. (From the Indian Scientific Agriculturist. November, 1925.)

Paddy and Pasture II

"BY A. GALLETTI, I. C. S."

(Continued from 1925 October Issue.)

Methods of Italian Farmers. In the last article I showed how the rotation of crops had solved the problem of pasturage in Lombardy. My facts and figures are correct but I had given them often before and am not aware that they had made any impression on any one. People only believe what they see themselves.

But after all it is not such a far cry to Milan and more and more Indians, as well as Anglo-Indians, pass through Lombardy every year now. From May to August they will see the paddy growing if they look out of the windows of the train; in May they will see women bending over and transplanting just as they do in India; when the rice is young they will see the week's "drying" or total removal of water, which is not at all practised in India; they will see how well and neatly the bunds are laid and kept and how the water is guided and regulated within the beds, which is not done in India; and how only a measured quantity of water is used. But it will be better to get out at Milan and arm oneself with an introduction and go and see a paddy farm.

An Italian rice estate is strikingly regular. The paddy-fields are exact parallelograms, all the bunds and channels are perfectly straight, and the larger bunds are all planted regularly with trees. The fields are kept beautifully clean either by employing an army of female weederes or by a new method of which Signor Rossi informed me. He sows with a special instrument which makes small furrows and deposits the seeds on the ridge between. The result is that the weeds get drowned while the paddy springs up. Forty days after sowing he passes another special instrument down the furrows to extirpate such weeds as may have come up. His fields were quite remarkably clean. This system is known as the Cabrini system after the inventor and is a recent invention. Signor Rossi said he would be very pleased to show it to any one from India (sowing season is end of April.) All the Lombardy paddy growers use chemical manures profusely. No general advice can be given but there can be little doubt that the profuse use of chemical manures combined with rotation of crops and clean weeding contributes to the high Italian yields.

The visitor may see the regular paddy-fields, the special instruments and the manures. But let him look at the meadows, both summer and winter, and convince himself that three-fifths to two-thirds of the land that could grow paddy is devoted in rotation to meadow and dry crops.

Good Rice and Fine Cattle. If the Indian visitor goes to Ravenna a place worth visiting for itself let him also study the paddy growth at the mouth of the river there. It is a country of fine cattle and good pasturage and the chief crop he will see is lucerne. Paddy is grown not so much for its value as because it is the only suitable crop pending the silting up of the soil. When the soil has risen sufficiently, wheat takes the place of paddy. The common rotation there is two years paddy, then 2 to 5 years lucerne, so that five-sevenths of an estate may be under fodder and only two-sevenths under paddy. Indian conditions are very nearly reproduced here; the flat swampy country is not unlike Bengal; paddy is not cultivated with care or much manured and made to yield much; but even there, though the population is thick and men must eat, more land is devoted to food for cattle than food for men; and there too the cattle put all Indian cattle to shame. The Indian is not cruel to his cattle but very very callous. He will not give up one inch of his land to them. He wants it all for himself. He will only stall-feed a very few and leaves the rest to multiply without limit and then to starve down to the limit that the public pastures can sustain. He takes no thought for what they will do in the hot weather when there is not even the scanty grass of the public pasture and the rocky jungle hills and never dreams of cutting grass and making a hay-stack. In India we have only the straw-stack-stuff fit for cattle to sleep on but not to eat. Let the Indian visitor look about him in Europe. He will find every farm house encircled by as many hay-stacks as straw-stacks.

What The Italian Farmer Does. The Italian peasant lives in a joint family with his brothers like the Indian and is much attached to his brother, and will greatly lament if his brother dies, but far more if his ox dies. Such is the high estimation of his cattle in a country where the bullock is the mainstay of the house though the cow is no object of religious veneration. Let the Indian visitor to Italy learn to appreciate the feeling of the Italian ryot towards "the pious ox whom the mild Virgil loved" and he will come back to India and found a Cattle Protection Society, no longer to protect the Hindu sacred cow from the Muhammadan butcher, but to protect all cattle against the heartless neglect and unconscionable cruelty of the East.

The paddy-farmer of India who knows no better than to sow paddy every year in all his fields, has some excuse in the supposed greater value of the crop. But the dry farmer has not even this. His dry crops are usually of little value and it is his clear duty to sacrifice some of them every year and to grow fodder crops for his beasts. It will also pay him. In my part of Italy we used, in my father's time, to divide the land into four parts one for wheat, one for maize, two for fodder, and rotate these three crops. The peasant paid his taxes out of the wheat, fed himself and his family on the

maize and his cattle on half the produce of his farm. So he maintained himself and his family on one quarter of the farm and gave half to his cattle. Now we go even further. We divide the farm into five parts, one for wheat, one for maize, three for grass and fodder; and we find it pays. Cattle pay us, quite apart from milk products which we do not get on the dry farms. We reckon one-third of our total profits come from buying cattle as calves and selling as adults. The reduction of our wheat and maize areas have done us no harm. With more and better cattle and more cattle manure we plough and manure better and we get a bigger food crop yield from two-fifths of the land than we used to from half. Again and again I say without good cattle, agriculture will not flourish in India. The present Indian miserable breeds must be entirely replaced. The new breeds must be fed sufficiently, housed properly and restricted in their breeding. Aged cattle should not be kept at all and young cattle should not be allowed to breed.—(*The Statesman.*)

REVIEWS.

Season and Crop Report.

MADRAS PRESIDENCY 1924-25.

This Report forms very interesting reading, bringing out prominently the inherent defects in the agricultural condition of this province. A close scrutiny of the statistics given would enable a student to understand clearly the rural economics of this presidency and the state of its agricultural condition. The aim in publishing this report seems to be to secure as far as possible accurate and reliable statistics of local agricultural conditions.

The arrangement of the figures and of the statements are thoroughly satisfactory. What would take one year to understand the agricultural conditions of the country, can now be learnt in a short time by a careful study of the above statistics. For this the Director of Agriculture, Mr. Anstead, and his Statistical Assistant Mr. V. N. Viswanatha Rao deserve our thanks.

That the prosperity of the ryot depends upon the availability of water and manure requires no discussion. Owing to capricious monsoons 13.8 million acres of cultivable area has been allowed to lie fallow. If the ryot were able to sink wells in this vast area it could be brought under cultivation with benefit both to the cultivator and the country.

Out of a total population of $42\frac{1}{2}$ millions in this Presidency 33 millions or nearly 8 % were engaged in cultivating 33 million acres. The total number of draught animals (bullocks and he-buffaloes) is $8\frac{1}{2}$ millions. $4\frac{1}{2}$ millions of ploughs, including 17,000 iron ploughs were in use. The report also gives us other interesting figures that there were 1.1 millions of country carts, 6 million young stock, 20 millions sheep and goats, 164 thousand other head of animals, 268 oil engines and 600,000 wells.

An analysis of the above figures gives us the result that there is one acre available for one man, that one pair of animals serves 8 acres that one plough is to do service for 16 acres and that one cart is available for serving 30 acres and that one well suffices for 3 acres of land and that for a population of $42\frac{1}{2}$ millions there are available $7\frac{1}{2}$ millions of cows and she-buffaloes. A further analysis exhibits that out of the 33 millions acres of arable land only 9 million acres get the benefit of irrigation either from canals, tanks or wells. It is also clear from the statements that the yield of crops on irrigated areas as compared with dry land is fourfold in the case of cotton and twofold in the case of cereals. If all the waters of the rivers in the Presidency that now run to waste can be utilised for irrigation purposes and if the sub-soil water also is made available by sinking more wells, the agricultural population of this presidency will find work all round the year without being put to the necessity of emigrating to other countries. They will also be enabled to produce more food for the teeming millions of this province.

We find that the $4\frac{1}{2}$ millions of ploughs used are wooden ploughs and one has to function for 16 acres and a plough on an average weighs about $\frac{1}{3}$ c.w.t. It is common knowledge that wooden ploughs rarely last more than one agricultural season, viz., one year. To replace $4\frac{1}{2}$ millions of these ploughs it would require 75,000 tons of timber for which large numbers of trees have to be cut every year. If these ploughs could be replaced by cheap, simple wrought iron ploughs without castiron parts a great number of trees can be saved from destruction; and the scarcity for fuel and the wasteful use of cowdung may to a large extent be prevented. Further, conservation of a large number of trees would ensure supply in large quantities of fodder for sheep and goats and would greatly contribute to improve the climatic conditions of the country.

The source of power that is at present used for agricultural production is the bullock. During the cultivating season the total number of bullocks is found insufficient; while in the non-agricultural period the ryots are unable to find sufficient work for them with the result that they are underfed and starved. It is also common practice that the best pairs of bulls are used mainly for

transport work, while only the inferior ones are used for agricultural operations. Further most agricultural implements and machines are very crude and inefficient. The need for better machines is keenly felt; and money spent in promoting inventions in this direction will be a great boon.

Coming to the question of manures, the chief sources are the refuse of all agricultural products such as husk, straw, oil cakes, the droppings of men, animals, dead animals and their remains, such as fish, bones, hoof, blood etc. and mineral substances such as nitrates and phosphates. Much of the agricultural by-products is not available to the villagers on account of the lack of simple, labour-saving machines that could be utilised with the available animal power, namely bullocks. No permanent benefit can be obtained by imposing heavy export duties on manures as such exports are mostly raw agricultural products. The only way by which the valuable manurial refuses can be saved for the country is by making the ryot use simple machines for dressing the produce for the market. By this process all the valuable by-products can be saved.

The report gives us figures for the number of cattle-deaths by disease. If along with this the total number slaughtered is also taken into account on a rough estimate something like 100,000 tons of bones are allowed to be exported out of the country. This enormous waste of manure can be prevented by a little educative propaganda among the ryots, drawing their attention to the manurial value of bones. If the ryots are only taught this they are not likely to allow boys and girls to steal away bones lying scattered in their fields.

The statements about the crop returns are very valuable and equally interesting. It is stated that $10\frac{1}{2}$ million acres of rice land produce $7\frac{1}{2}$ million tons of paddy which when dressed properly yields 5 million tons of rice. 14.8 million acres bearing other cereals such as kambu, cholam, ragi etc. gave a net yield of 3.5 million tons. So it will be seen that the total quantity of clean cereal grains-the staple food of the country-amounted to $8\frac{1}{2}$ million tons. This has to satisfy a population of $42\frac{1}{2}$ millions. On an average it works out to $\frac{1}{5}$ of a ton per head per year. For living in comfort at least $\frac{1}{4}$ ton, of food grains is necessary per man per year. We also see that there are $7\frac{1}{2}$ millions of cows and she-buffaloes. Of these 50 % may be considered to be with calf, so that only 4 millions of milch cattle have to meet the demands for $42\frac{1}{2}$ millions of people. That again shows that one cow has to produce for 11 people and supply them with milk, curds and ghee.

From the above paragraphs it will be clearly seen that the population of this Presidency is in a chronic state of starvation. It is therefore necessary that the ryot must be helped to produce more crops if the country is to remain healthy and produce healthy men and women. The ways and means by which this could be attained is by preventing the diversion of 1,00,000 tons of bones from going out of the country as also 3,00,000 tons of oil-cakes. The export of these valuable manures really saps the fertility of the soil and unless speedy steps are taken to prevent this unnatural denudation of the fertility of the soil, ere long the arable lands of this Presidency will be a mere Sahara.

The ryots should also be considerably helped in the matter of utilising the sub-soil water by being helped to dig more wells and be made less dependent upon the capricious monsoons. So, in fine what is most needed to improve the condition of the ryot population of this Presidency is to make available to them more manure and more water. This really is the magic for the improvement of the lot of the Indian Agriculturist.

It is hoped that in future reports the following additional information may be made available and would be welcomed by the public who are interested in reports relating to rural statistics:—1. A map showing the different kinds of soils available in this Presidency. 2. A map showing the cultivable lands available in the different districts, with the railway lines and the roads marked, if possible, as also information regarding the use to which these lands can be put to, such as cattle breeding, dairy farming, coconut plantation and so on. 3. A statement regarding the quantity and amount of subsidiary industrial occupations available for men and animals engaged in agriculture in the various districts. 4. A statement showing the number of live stock in each district classified according to the breeds to which they belong. 5. Information may also be made available with regard to the available portion of the reserve forests and fodder areas and also the extent of private pastures available in each district. 6. Statistics regarding the animals (cattle and sheep) slaughtered for food purposes, may, with advantage, be given.

Finally one suggestion is made to the Department that all this information may be summarised in vernacular and be made available for non-English knowing sections of the population.

S. RAMACHANDRA AIYER.

Notes.

Education and Trade. The waste of young life which has been going on increasingly since 1919 could not continue without awakening the gravest misgivings as to the future of this realm. Thousands upon thousands of youth, having reached the completed age of 14 years, have passed out of our schools, the majority of them without having secured their qualifying certificates. If there had been openings for them in which they could have secured handicraft employment the detriments to the state would not have been so disquieting. Had they even found employment for their hands it would have been well, but unhappily thousands of them during these years have never learned to do any work not even of the blind alley order. That something should be attempted to stay this wastage is a common place of patriotism, and Lord Salvesan and his colleagues have before them no common or easy task.

In the cities there are in connection with the Ministry of Labour Juvenile Advisory Committees, the members of which do their best to see that youths to whom the "dole" is being paid attend the classes opened for their special benefit and are constantly on the outlook for work. These Committees also meet with the boys and girls who are leaving school and their guardians and endeavour to get the latter advised to send the young people to the continuation classes, and thus have their time occupied until they obtain work. Some success has been achieved in this endeavour; but it is a heart-breaking experience to witness the unwillingness of girls to undertake employment as domestic servants. The boys are much more amenable to advice, and not many of those who have come under our notice would be ideal if work were available for them. The most disquieting feature in this connection is the ever increasing number of those who have never done any work. It is much easier to place a boy in work who has just left school than one who has been out for three or four years. Unhappily also too many employers are only too willing to exploit boy and girl labour between the ages of 14 and 16, and then cut the youths adrift when national insurance has to be paid on their account. The problems thus created are terribly involved; they are almost baffling; and unfortunately we have in our midst too many eager to upset the existing fabric of society, who have no particular desire to see things better. The strictness of the hour is their opportunity and they utilize it for ends that do not make for national stability.

(Scottish Farmer, dated 28th November 1925.)

Rules for Tree Planting.

1. Remember first and last that a tree is a living thing; it thrives with good treatment, struggles for existence when indifferently treated and dies when neglected.
2. Plant in properly prepared soil, ploughed well and cross-ploughed and subsequently harrowed. The finer the tilth, the better the start the trees will get.
3. Dig square holes, not round, and fill with well pulverised surface soil; leave no grass or roots in the holes, as these may form air cavities.
4. Use small transplants, 6 to 9 inches. They stand the shock of transplanting better than large ones.
5. See that the plant has a good bushy system of fibrous roots. Discard plants without. Shorten any very long tap or side roots.
6. In removing plant from tray or seed bed take great care not to break the small roots. Between this operation and planting do not expose roots to sun or wind. Do not press a firm ball of earth round the roots.
7. Plant the tree the same depth as or a fraction of an inch higher than it stood in the seed bed or tray. Do not cramp the roots.
8. Plant on a dull or rainy day, and if not actually raining give each plant a little water.
9. Hold the plant slightly above the correct height in the hole, with complete root system naturally spread. Gradually fill in well pulverised soil. When finished, firm down evenly all round with the feet and give a little water to settle the soil.

(Rhodesia Agricultural Journal January 1926.) S. N.

Farmers' Weather Lore. Being constantly out of doors and being engaged in an industry that is largely controlled by seasonal influences, farmers in all countries naturally take great interest in weather conditions. Before weather forecasting was placed on a more scientific basis, much attention was paid to the happenings on certain days, which were considered ominous of the ensuing weather. Thus the twelve days preceding Christmas were in France believed to represent month by month the weather of the ensuing year. In

this country there was a similar superstition with regard to the twelve days beginning with 31st December. Christmas day, however, was regarded as portentous; if it fell on a Friday, the early part of the winter would be severe but the following spring and summer would be favourable. When Christmas came while the moon was new, and especially at new moon, farming would prosper during the ensuing year.

Possibly there is some truth in proverbial observations with regard to the effect of different kinds of weather at particular periods on the subsequent progress of crops. "If you see grass in January, stock your grain in the granary." Tusser observed that "A kindly good Janiveer, Freezeth the pot by the feer (fire)." The prejudice against wet weather in this month is indicated by the couplet "December's frost and January's flood never boded the husbandman's good." The somewhat unusual occurrence of thunder in November and December recalls the old belief that this presages abundance of corn.

(Journal of the Ministry of Agriculture January 1926).

The prognosticatory significance of weather at Christmas time, mentioned above is strangely reminiscent of the belief of the importance of the "Garbha-Ottam" period, also falling about the same time, prevalent in the Tamil Country.

EDITORIALS.

The Task Before the Union.

The Royal Commission on Agriculture has been appointed and will assemble in India in October next. How is the country preparing to meet it and profit by its coming? The Union is celebrating the Golden Jubilee in July next. In the country there are yet no signs of any activities except perhaps in official quarters. Considerable changes have taken place in the agricultural conditions since 1871 when the Suez Canal was opened and India was brought into more intimate touch with European and American markets but no investigations of a very comprehensive nature have been undertaken in the past and the progress of science during the last quarter of a century has accelerated developments in all industries in the

West including the agricultural and it would be against the natural order of things if India alone would persist in following the course that was suited for conditions that no longer exist. She is at the parting of ways and must choose now and choose rightly, for, upon this depends her future existence as an agricultural country. The Union also has a duty to perform in this connexion. For it is, so far as we are aware, the only organised body of scientific agricultural workers of several years' standing and circumstanced as it is, fit to give a lead in guiding public opinion towards correcting the existing defects in the agricultural practices and anomalies in the status of the ryot. The subject bristles no doubt with difficulties but these are not insurmountable and should serve as stimulants rather than deterrents. A few points on which correct information is necessary seem to us to be (1) whether the land is really producing as much as it could, (2) whether it is possible to increase production, (3) in what directions India can change her crops, (4) how far she can rely upon her present cattle-manure and water-supply, (5) in what ways she can sell her products to the best advantage, (6) how the ryot spends all his income, (7) what impediments, if any, there are towards the amelioration of his present condition. We would request our readers to forward their considered views on these and allied questions so that they can be collected and submitted if necessary in the form of a memorandum before the Royal Commission and used in oral evidence, should the Union be called upon to do so.

Agricultural Museums.

India is an agricultural country. Yet in this land, there are few centres where the products of husbandry are collected and housed in a decent way, and where seekers after knowledge can see them and learn for themselves. The London Exhibition of 1851 and the later exhibitions at Paris, Philadelphia, Amsterdam, Berlin, Prague and a number of other towns in the west during the past 75 years brought the growers and consumers together to the immense advantage of both and tended to stimulate interest in agricultural production. A jack fruit which weighs 50 lbs., a pine-apple which weighs 8 lbs., a paddy ear with 700 grains, a plantain bunch with 470 fruits, a cholam ear which gives 2 lbs. of grain are not met with every day, but are objects of attainment when steadily worked up to. The history of the development of sugarbeet since 1,800 furnishes a very good example of what knowledge and industry can do to improve a staple.

It is the boast of enthusiasts that Dacca in ancient days produced muslins of superior quality—such knowledge has come to them through records. But how many of us are aware that for this information we are indebted to places outside India where Indian products have been preserved for hundreds of years. It would seem appropri-

ate that each distinct agricultural tract should be provided with a museum of agricultural products. Preferably they may be located near or attached to agricultural colleges and may contain productions of other countries, obtained through exchange. This will encourage co-operation between workers and tear the veil of suspicion hanging over ignorant men or interested self-seekers. Will the Golden Jubilee in July next afford an opportunity to discuss the subject?

Two distinguished visitors.

During the month the staff and students of the College were entertained to two intellectual discourses by Prof. Oscar Buck of America and Dr. James Cousins of Adyar. Prof. Buck gave an enlivening address on the 16th on the student movement in China with special reference to the enormous influence it exercises in moulding the character and widening the outlook of the modern Chinaman. Dr. Cousins' was pitched in a sweeter tone and dealt with the philosophical aspect of Rabindranath Tagore as illustrated in one of the choicest verses of Gitanjali.

Our Director and Subordinates.

Mr. R. D. Anstead's visit during the month was availed of by the Artists' Association and the Lower Subordinates' Association to place a few facts concerning their salaries, travelling allowance and prospects generally. Messrs. T. S. Alwar Aiyangar, P. Doraisawmy Mudaliar, and S. R. Srinivasa Ayyar represented the artists while Messrs. P. M. Appaswami Pillai, S. Muthusami Ayyar, R. Narasimhan and C. V. Sankaranarayana Ayyar were deputed by the Lower Subordinates' Association. The Lower Subordinates rightly felt that if the rate of promotion was based on last year's figure it would take them far beyond another 20 years before the existing number is absorbed into the Upper subordinate service as they were encouraged to hope. Their second point was that for the filling in of posts in Science sections and in the allied activities under the control of scientific heads, non-agricultural men were being brought in and that this system placed them at a very great disadvantage in the matter of promotions. Another point on which they laid stress were the difficulties they undergo with the limited salaries and allowances they get when they are obliged to be in camp in a particular place or two even sometimes for two to three months all the time being compelled to pay house ~~rent and water~~ tax for houses standing in their names on the estate which they cannot vacate as under the rules of the College Board once a house is vacated the claim for a house later on is not entertained. We hope these representations will receive due consideration.

Departmental Notifications.

Appointments and Transfers:—Mr. K. Ragbavacharya, agricultural Demonstrator posted to Central Cattle Farm, Hosur on expiry of leave.

Mr. A. K. Annasamy, to officiate as Upper subordinate, Vth grade and posted to Central Cattle Farm, Hosur.

LEAVE ETC.

Second Circle:—Mr. K. V. Seshagiri Rao, assistant demonstrator, Tenali, leave on average pay for 10 days from 22-2-26.

Mr. A. J. Mascarenhas, farm manager, Guntur, leave on average pay for one month from 2-3-26.

Third Circle:—Mr. M. Vi araghava Rao, agricultural demonstrator, extension of leave on average pay on medical certificate for 1½ months.

Fifth Circle:—Mr. L. S. Netesa Aiyar, Agricultural demonstrator, Karur, leave on average pay from 17-1-26 to 16-2-26.

Sixth Circle:—Mr. C. J. Balraj, assistant demonstrator, Madura, leave on average pay for one month from 12-2-26 or date of relief.

Mr. C. S. Namasivayam Pillai, assistant demonstrator, Melur, leave on average pay for 20 days from 10-2-26 or date of avail.

Seventh Circle:—Mr. E. Achyuthan Nayar, assistant farm manager, Taliparamba, leave on average pay for 15 days from 7-2-26.

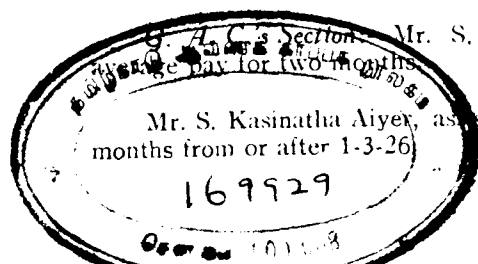
Live-Stock:—Mr. M. V. Narasimha Sastry, assistant manager, Chintaldevi leave on average pay for one month from 6-2-26.

Central Farm:—Mr. V. Viswanatha Aiyar, assistant manager, two weeks leave on average pay from 4-3-26.

G. M.'s Section:—Mr. C. Krishnan Nayar, assistant, leave on average pay for three months from 1-3-26.

G. L. C's Section:—Mr. S. Suryanarayana, assistant, leave on average pay for two months from 1-3-26.

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