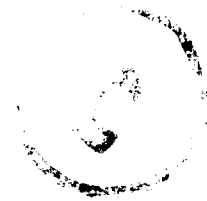


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SEEDS

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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
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Vol. XVI] JUNE 1928. [No. 6.

Sheep Breeding as a Side Industry in Southern India. †

BY P. KRISHNAN NAMBIAR.

Sheep breeding in Southern India especially in the Madras Presidency is in a neglected state. Some people took up the work some years back and conducted experiments for sometime, they gave it up owing to some reason or other. The result was that no improvement has taken place. An idea of the present method of sheep breeding in several tracts will be of some use to realise the main causes of deterioration in sheep. Sheep breeding round about Coimbatore, Salem and Bellary is mainly done by shepherds who live by their flocks. They move with their flocks from place to place all the year round searching for good pastures and also for ryots' lands for penning them. The shepherds care very little for the season or for the health of the animals. They do not give sheep any kind of concentrates or fodder, green or dry, beyond what the animals pick up on pasture grounds. What happens in summer is these animals live on starvation diet. During the monsoons flocks of sheep suffer and the sharp winds being inimical to their health they die in numbers every year.

* Paper read at the M. A. S. U. Conference in July

The rams are always allowed to roam about with the flock and lambing continues all the year round. The ewes soon after they lamb, are generally milked and the milk is used for human consumption, leaving the young ones to suckle empty udders every day. Thus the growing lambs become very weak and succumb to disease and casualties among lambs are generally 70-80% and even the remaining ones become very sickly and inactive.

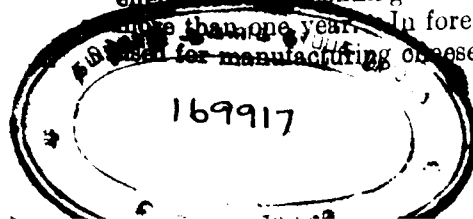
Clipping is generally done twice, once just before winter to make cumbles for the shepherds and the other sometime before the monsoons.

There are few professional shepherds on the Nilgiris and in Mysore and sheep owners are mostly ryots and landowners. Each man keeps about 50 to 80 sheep in the flock. In Mysore during the inclement weather and on the Nilgiris throughout the year owners house them.

On the Hills, sheep are housed in closed bin—like sheds with no ventilation whatever but with litter of dry leaves. This is done to collect urine and dung. Here sheep are reared mainly for manure; bedding is removed once in 2 weeks. What happens in the meantime is that the whole thing forms a mire and the leaves decompose emitting a very bad smell. Sheep are shoved in by force at about 5'o clock in the evening and they are let out at about 10 A. M. the next day. All these sheds are overcrowded and about 1 to 2 feet depth of dung and leaves mixed with urine is found inside. When sheep come out of these, they are almost wet even in summer and are found gasping for breath. Clods of moist dung would be seen hanging all over their bodies and each animal will carry about 5 to 10 pounds of extra weight with it according to the size of the animal.

Further, washing, clipping and dipping are not at all practised and the sheepowners do not gain anything in the shape of wool. They very often complain about the very high mortality among their sheep and lambs and it is only natural so long as they carry on their present practice of rearing.

Sheep are one of the principal sources of agricultural wealth and furnish both commercial and manufactured products such as, mutton, wool, bones, skins etc. Their dung and urine are very much appreciated for the improvement of the soil. The beneficial effects of sheep penning on a particular soil are generally felt for more than one year. In foreign countries ewes' milk is generally used for manufacturing cheese.



The climate and rainfall of Southern India except of the West Coast and Nilgiris are suitable for sheep breeding.

There were several breeds of sheep in Southern India many years back, but some of these have disappeared due to very rapid deterioration, and a few still found are Nellore sheep, Madras sheep, Bellary, Mysore and Coimbatore breeds of sheep.

The two breeds, Nellore's and Madras's are bred for the carcase only and are not fit for the dual purpose of mutton and wool. The other breeds i. e., Bellary, Coimbatore and Mysore are woolly breeds and give a fair quantity of mutton too. These can be improved with care and due selection and proper attention to feeding and housing. Short experience with the Bellary sheep on the Central Cattle Farm is promising. The Live Stock section took over this work only two years ago and within this short period it was possible to produce valuable ewe hogs and ram lambs out of the original lot and much more may be expected of them in future.

Recent trials with Merino Bikanir cross-bred rams and ewes from Hissar Farm have been disappointing for crossing on local sheep.

The difficulties of crossing local ewes by Merino rams at present are many. And even if tried it is very doubtful whether we can get a satisfactory result under the existing conditions.

The colour of the breed will have to be considered to some extent. White wool is found more attractive than black or mixture and it fetches more value than any other. So if a ryot should try to possess a flock of sheep with white wool he should never allow any black ram to mingle with his flock. It is always better to keep only whites or black faced whites which may also serve the purpose. To keep a pure white flock is very difficult, for black is always a dominant character over the white. Bellary and Coimbatore are black-faced-whites and Mysore is pure white. Even among these we find lots of variations.

Feed :—The sheep require fodder and concentrates. The only question is when to feed fodder and concentrates and how much. We all know that sheep can bite close to the ground and for this reason they can thrive on scanty pastures. Hence, these can be grazed on field bunds and on scanty pastures left by cattle. They can also be grazed on live fences and hedges, for they eat almost all sorts of leaves. The main thing that a shepherd or a

ryot has to see is that his flock returns to the shed with well filled stomachs. This is easy just after the monsoon, when fresh grass is up. But this time eating too much fresh grass may bring on diarrhoea. A dose of $\frac{1}{2}$ oz. of salt and a quarter pound of rice bran will easily check this tendency. This will harden the droppings and the complaint may not last many days. Shifting sheep from one pasture to another at least once in two weeks is also desirable.

The difficulty of feeding them arises only in summer, when they have to be fed on leaves and also concentrates if possible. Sheep eat almost all sorts of leaves such as wild fig leaves, jack tree leaves, banyan leaves, korukapalli leaves and so on. They also eat the fallen fruits and pods of the (avenue) trees such as korukapali pods, fig fruits, babul pods and so on. And some of these are waste products of the farm. Agathi leaves also were found quite fit. Some of these leaves and fruits were found to have as good an effect as concentrates.

Fodder cholam, fodder maize, grasses, lucerne and silage chopped can also be given. Silage did immense good on the Central Cattle Farm during the last summer (1927) when all the pastures had failed. Sheep were found a little bit shy in the beginning, but gradually they ate the grass and cholam silage with eagerness and they were mainly living on this for two months and were quite healthy. Even the lambed ewes were quite all right with the sweet silage made in the farm this year.

Concentrates need not be given throughout the year. The proper time to feed sheep on concentrates is just a month before and also at the time of mating. This will not only improve their condition but will also induce them to come to heat sooner. The proper quantity to feed is about $\frac{1}{2}$ pound cake, $\frac{1}{2}$ pound rice bran and $\frac{1}{2}$ oz. salt per head per day. This must be continued for two months. Salt is essential and must be given now and then throughout the year. This can be given mixed with some food or rock salt may be left in the stalls or pens for them to lick whenever they like, failing this they will eat earth and diarrhoea or dysentery will set in and may do havoc. Feeding concentrates to the ewes before mating has another important effect and i. e., the percentage of twins born in lambing will be more. Generally woolly sheep will drop only one lamb, but it has been experienced that ewes fed with concentrates just before and at the time of mating gave more number of twins than

those without it. In this way also the owner will not be a loser, by feeding his flock with concentrates. Lambed ewes should get no rice bran and cake at least for a few weeks after lambing. For, the percentage of deaths among lambs will be more, due to the very rich milk the dams give.

For disposal, the owner can also feed with concentrates certain selected undesirable animals. It is advantageous to sell sheep after fattening, rather than selling them in their poor condition. This he will have to do once a year after overhauling his sheep. Lambs should never be sold before fattening for it will never pay.

There is another important thing for a ryot to consider. Just like cattle sheep too require shelter during the inclement weather. The shed need not be costly but it must be put up on an elevated place and should be kept dry throughout. It must also be raised from the surrounding ground level and must be disinfected at least once a week. It must be well ventilated and must contain 4 to 5 compartments. These compartments will be useful at the time of mating, and secondly at the time of lambing to put different classes of animals in different compartments. For example, during the mating season lambs must be put in one compartment, served in another, grown up rams in the third, ram with the ewes in the fourth and so on. During lambing the parturition ewes must be kept apart, the lambed ewes in one, grown up lambs in another and so on. It is also desirable to provide them with bedding of hay or dry soft leaves during the monsoons, provided the stalls are cleaned every day and the floor allowed to dry. Wet beddings should never be used in the stalls and the damp front is also objectionable. For, the sheep are liable to catch cold in the first instance and may develop pneumonia to which sheep are particularly liable.

Mating:—Mating sheep is another important thing and during that period a shepherd has to pay a little more attention towards his flock, because it is then that he lays the foundation of his future stock. A month before mating he should select all good ewes from his flock and feed them on concentrates till they are mated. In selecting ewes he must see that ewe lambs under one year and eight months (which period has been considered enough for ewe lambs to become adults) are not included in the mating batches. Rams selected for breeding must also be fed on concentrates to an equal period or sometimes even longer, to have

sufficient vigour and strength to cover all the ewes put under a particular ram during the prescribed period. In-breeding should not be carried out and to avoid this he will have to change his breeding ram once in every $2\frac{1}{2}$ years or $3\frac{1}{2}$ years. He should also see that no young ram under 3 years or old rams over 8 years are used for mating. A good ram in his prime i.e., between 3 and 6 years will easily serve about 30 to 40 ewes in 3 weeks. He must also see that the selected rams have not got more black patches on their coats if he is having a white flock. Further, the ram must be of a very good constitution and must have a good appearance with a broad pelvic region and strong hind quarters. He must be of a very good pedigree, i. e., his sire and dam should be very good wool and mutton yielders. The shepherd must also see that all the parts of that particular ram and also lambs are in proper form and size. The above points will be enough for the ryots to keep their stock to a standard and it will not also be very difficult for them to select one of this kind. If a ryot has not good rams with him, it is always better to go in for good ones, rather than spoil his flocks by using bad ones.

The period of mating should not be lengthened, simply because one or two ewes were left uncovered. For, the lambing also will be prolonged to an equal period, which must be as short a period as possible. Else, the owner may not find it convenient to pay as much care and attention throughout, which the young lambs may require.

Another thing to be noticed in mating is the season. This can be regulated according to the owner's convenience and also according to the weather and rainfall conditions of the locality. A ryot or shepherd should adjust his mating in such a way as to get his lambs just after the rain, when fresh grass is up and before winter. It has been experienced that the percentage of mortality among lambs born in this season was very much lower than in any other season. In South India, since we get rain in June, July and August, the proper time for mating sheep will be the end of March or earlier part of April. The period of gestation among sheep is only 150 days and the owner can expect the lambings in September-October when it will be easy for him to feed his lamb-ed ewes and lambs with tender grass and leaves.

A month before the expected lambing the owner has to see to the following particulars because at this time many ewes will be in

an advanced state of pregnancy. The owner must be very kind to these parturition ewes. These must have tender leaves and dry pasture and also a fair amount of exercise. Shifting ewes from place to place, changing pastures every now and then and also the change of fodder will do them good. A shifting fold will have to be used in such cases to facilitate their folding in different places, but all the same, he must be careful to fold them only on dry and never on moist lands.

A week or so before parturition, the owners will have to isolate all ewes that are very much advanced in pregnancy into one group and should graze them separately. They must be housed in a separate compartment away from the main flock with ample space inside, that is to say, they should never be overcrowded.

During this time the owner or at least the shepherd boy must sleep in the stalls very near to the parturition pen to give prompt help and also to attend on the lamb-ed ewes and lambs. Help at the time of parturition is important. The shepherd must visit the ewes from time to time during nights so as to afford assistance when really required. Many lambs and ewes are being lost for want of proper assistance while lambing, but he must also be careful to avoid unnecessary interference, which may also be detrimental to their health. As soon as one ewe lambs he must remove her from the pen to another adjacent pen and must allow her to remain quiet for sometime at least till she drops the placenta which may come off in two hours. Meanwhile the boy must dry the lamb, always keeping it near the mother for fear that she may forget her lamb. Then the lamb must be made to suck the udder for sometime. Then give the mother some tender grass or leaves to eat. She must be allowed to remain with her lamb away from the other flock at least for one full day. The following troubles are met with at this time and many lambs die for want of proper attention to these tiny ones which after all is not very difficult:

Young ewes may neglect their lambs after lambing, also weak and old ewes may sometimes do the same. In such cases the lambs will have to be forced on them for 2 or 3 days after which period the ewes will themselves take them and there would not be any further trouble.

In certain cases, the outward opening of the milk teat will be blocked up by a gummy substance and the milk may not flow even if the lamb suckle for a very long time. In such cases the ewe must be handled slowly and keeping the lamb near the teat the gummy substance must be drawn out before forcing the lamb to suckle the teat. After a few minutes' suckling, the milk will begin to flow as usual.

In some cases the mothers would not have any milk at all and the owner will have to feed the lambs on cows milk. In places like Mysore and Coimbatore, there is a practice of keeping milk goats to act as wet nurses to the deserted lambs. There is nothing but the owners' eye to find out all the troubles mentioned above and also to remedy them then and there, failing which many may die within few days after their birth.

For eight or nine weeks the lambs are able to live on mothers' milk alone, but it is advisable to feed them with tender grass after 3 or 4 weeks. The lambed ewes with the lambs should never be let out when there is dew on the grass. For they will catch severe types of dysentery and many will die at one stretch. They should not also be exposed to the severe sun or rain and they must be well sheltered till the lambs are strong and ewes healthy.

A shepherd or a ryot will have to be extra careful about his lambs only for about a month or 5 weeks after which period he can leave them to Nature to some extent. When the lambs are about a month and a half old, they may be mixed with the main flock.

Weaning of Lambs :—Lambs must be weaned when they are about 3 months old. The process is very simple, i. e., all the lambs after 3 months must be picked up separately one evening and must be housed and grazed separately for 3 consecutive days. On the 4th or 5th day, these can be mixed again with the main flock during which period, the dams will forget their lambs and may not allow them to suckle. Weaning must be done for two reasons. If the lambs are allowed to suckling till they attain 6 or 7 months old, this will tell very badly on the constitution and health of the dams, for they would not have sufficient time to recoup their health before the next mating season. Secondly after 3 months, the lambs will begin to eat grass and fodder avariciously and if rich milk also is taken with it they may get jaundice and will die in numbers.

After 3 months the ryots have to select lambs for their breeding purpose. They must select and keep them separate and must also give some special attention to these. The remaining ram lambs must be castrated and fattened during the remaining 9 months and when they are a year old, they must be disposed of. The ewe lambs must be looked after properly, for they replace the old and weak ones in his flock.

Overhauling of sheep :—The last item in stock keeping is overhauling. Overhauling of sheep must be done every year. It is then that the ryot selects the good ewes for breeding. The remaining bad ones go to the butcher after fattening. The best time for overhauling sheep is just after shearing. Because this will help the owner to see the condition of the sheep and also whether a particular sheep is suffering from any skin disease and so on. Yearling rams, old and condemned ewes are the animals that a shepherd has to sell every year. In selecting old ewes he must know that the fifth year is said to be the prime in sheep i. e., no improvements can be expected from a sheep when he or she has passed the fifth year. As in cattle, the age of sheep can be detected by looking at the teeth. At the end of 5 years their mouths will be 'full' and after sixth year the sheep begin to lose their teeth, when they are called broke-mouthed. Up to 8th year they may be kept if in good condition and health, but not beyond.

In the case of an ordinary ryot who owns about 20 to 25 acres of land, it will be profitable to keep a flock of about 100 sheep on his farm as a side industry. A rough estimate of maintaining them is given below :—

ATTENDANCE.		Rs. A. P.
A cooly on 5 annas a day for a year	...	112 8 0
A boy on 4 annas for 3 months i. e., one month for mating and 2 months for lambing	...	22 8 0
Cost of concentrates for 100 sheep for 2 months at present rates	...	103 4 0
Depreciation on a shed costing Rs. 200	...	20 0 0
Cost of fodder during summer apart from the by-products of the farm, a rupee worth of green fodder per day three months	...	90 0 0

Sundries to meet clipping charges, etc.	...	50 0 0
Total Rs.	...	398 4 0
		Or Rs. 400

INCOME.

The present yield of wool of local sheep is very low. And we can take it as a minimum of 1½ lbs. per head and at 6 annas a pound	...	56 4 0
Out of 100 sheep one can expect at least 80 lambs to come up, to be on the safest side we will take it as 70. Out of these 50 per cent will be ram lambs and these 35 at Rs. 6 each will fetch	...	210 0 0
For 25 old owes to be sold every year at Rs. 5 each.		
For 35 young ones will be coming to replace them	...	125 0 0
Apart from the above the owner can gain at least 8 annas per night for penning sheep round about Coimbatore by penning them either on his own lands or on any other neighbour's lands. He can do this for a period of 8 months	...	120 0 0
During the other 4 months when he houses them in the sheds, he can at least collect about 4 cartloads of manure per month, being sheep manure each cartload can at least be valued at Rs. 3 each. Thus for 16 cartloads	...	48 0 0
Total Rs.	...	559 4 0
		Say Rs. 560

In the above estimate, the depreciation on owes and the value of ewe lambs are not included, because owner is expected to replace his old stock by ewe lambs. From the above figures we see by keeping a flock of 100 sheep as a side industry a ryot can realise Rs. 560 for which he has to spend only Rs. 400. Thus he can make a clean profit of about Rs. 160 at the end of every year. This estimate is based on the present state of sheep, but when improved a ryot may gain double or three times the amount.

Sugarcane Cultivation.

In the Northern taluks of Ganjam District.

BY M. GOPAL RAO, BERHAMPUR.

Introductory :—The cultivation of this important, industrial crop is done in small and scattered areas in the district. Conditions in the Northern Taluks seem to favour more extensive and concentrated cropping. A copious supply of sub-soil moisture, plentiful rainfall from June to December and well drained loamy soils of a good depth help good growth, while the sugar factory at Aska creates a good demand for the raw material. However, in recent years, owing to the rise in prices, and the heavy cost of cultivation, want of cheap credit, risky nature of cultivation, the area under sugar-cane has been on the decline. A deficient supply of water under the Rushikulya system, due to the uncertain pre-monsoon showers, and absence of a good number of wells in the cane growing areas, are responsible for the restricted cane area. The extent of cane cultivated by each ryot varies from one *bharanam* to four *bharanams* (one *bharanam* = 20 cents)

2. There is only one Local variety. It is a dwarf cane green in colour, with many aerial roots. This variety ripens in about 8 to 9 months. Locally Oriyas call it "Dhobo Akku" which means "White Sugar Cane". A long jointed, slender, and purple coloured cane is also found here and there. This may be the variety known as "Yerra". Of recent introductions are Java and Barbados, cultivated in the neighbourhood of Aska. Except in one or two villages these are grown almost mixed.

3. *Soils* :—Cane is cultivated in all taluks in wet lands, and to a small extent under garden land conditions also, water being lifted either from wells or from the nearest hill stream. It is cultivated on a variety of soils. In most cases, a rich loamy soil with a loose texture having good drainage facilities is preferred. Drainage in cane fields is not a serious trouble in the district.

4. *Rotations* :—Throughout the tract, on wet lands, cane is cultivated in rotation with paddy though there is no fixed rule followed regarding the interval. As a rule however sugarcane is not planted a second time on the same land before at least one crop of paddy is taken. Sometimes in parts of Dharakota (near

Aska) a crop of green gram is raised after paddy, and the land prepared for sugarcane. In the case of garden lands, ragi precedes a cane crop. In some cases as in parts of Halyabada etc., villages (near Chatrapore), it is again a practice to raise a crop of pumpkins, harvest the same in about February—March, irrigate the plot, and then prepare the land for cane. Though not grown as a regular mixture crop, it is a common practice to sow seeds of gogu *H. cannabinus* mainly for leaf, which is used for cooking purposes. These plants are however removed when sugarcane is about 3 months old.

5. *Preparatory cultivation* :—Whatever crop may precede sugarcane, the earliest time to commence preparatory cultivation is January and latest March. Where paddy is succeeded by cane, the former is possible, while the latter is adopted, when either green-gram, or other crops precede a cane crop. From the time of the commencement of the preparatory cultivation till the setts are planted, the plot is ploughed at least once a week, and after about a dozen ploughings, the land is brought into a friable condition and levelled. The soil is ploughed to a depth of about 5 to 6 inches and farm yard manure is applied or penning of sheep or cattle is done. In the case of farm yard manure, about 30 cart loads are applied; and in regard to penning, cows are preferred; and very rarely sheep. It is generally believed, that cane cracks when sheep penning is done. 100 to 150 animals are penned for 10–15 days. After the application of manure, the plot is invariably ploughed and levelled.

6. *Planting season* :—Throughout the Northern taluks the planting season is generally from May—June depending on the showers.

7. *Seed rate* :—The number of setts used is very high being from 36,000 to 54,000 setts per acre. The cost of setts varies from Rs. 80 to Rs. 100. Locally the price of one bharanam of setts (7'00) is about Rs. 16,

8. *How setts are obtained* :—It has been mentioned that the variety cultivated is a short duration one. The planting season is about the last week of May or the beginning of June; and the crushing season is in February. Thus there is more than 2½ months interval between planting and crushing. The conditions of water supply and climate in the district do no

admit of a portion of the crop being reserved for seed until May, nor do they permit the planting of the cane at the latter end of the harvest season February—March. It is under these circumstances, that the Oriya ryot was able to evolve a system of obtaining setts from a nursery cane crop which is indeed the best and which is perhaps unknown in other districts. This system of cultivating cane on nursery system for setts, is known as "*Gonda Monjee*" which means a seed cane crop. Hence, in this tract, there are two kinds of cane growers, the first is always a seed cane grower, supplying the seed cane and setts to the second who cultivates the regular crop either for wholly crushing or chewing. The latter never reserves any portion of the crop for seed but invariably obtains it from the former. Thus cane growers go to villages even more than 30 miles distant and obtain seed cane to plant up their crops. The origin of the seed cane growing may have been due to the short-lived nature of the local variety, the liability of the cane getting hard and dry if any portion of the crop is reserved for seed where water supply and climate conditions are not favourable, the impossibility of synchronising safely the planting of one crop and the harvesting of the other owing to defective water supply and finally, to the abnormal development of whorls of aerial roots at the nodes to about the three-fourths of the length of the cane, which causes the neighbouring buds to shoot, impairing their vitality, and making them unsuitable as setts.

Cultivation of seed cane :—The chief centres for growing seed cane are Hundetho, Bhimpur, Jamini, and Chandili in Chatrapore taluk; Kalasandapur, Kurla, Bhavanipur and Borida in Aska taluk. Of all these places, setts obtained from seed cane raised at Hundetho are preferred and are esteemed by the ryots. There are two distinct stages in the cultivation of seed cane (1) Raising of seedlings in a small nursery and (2) transplanting the seedlings into the regular seed cane plot *Gonda Monjee* which will supply setts later to the cane grower for the regular crop known locally as "*Akku*"

(a) *Raising seedlings in the nursery beds* :—The place selected for raising these is generally high level, well drained land and near a village, so as to enable the ryots to bestow great attention on them. The seed bed is ploughed a number of times, and fine powdered cattle dung is applied at 10 to 15 baskets per cent.

About the middle of July, canes obtained from the seed cane crop (Gonda Monjee) and reserved for the purpose are cut into setts of 3 nodes each, and about 6 inches in length, and planted in the seed bed one touching the other. The number of setts used is about 7200 in a cent of land. The setts being laid in the nursery, fine powdered oil cake is sprinkled over them, and a layer of moist earth is spread over. The seed beds are small in size and rectangular in shape, so that it may be convenient for watering, subsequent weedings etc., After the setts are planted water is sprinkled with pots. Too much watering is avoided, to prevent the shoots, from taking such a firm hold of the soil, as would afterwards render lifting them up impossible or difficult. The seed bed is said to produce seedlings sufficient to plant five times its area of seed cane plot. The seedlings having remained in the nursery for 6 weeks and having put forth 6 to 8 leaves, are removed and transplanted on the seed cane plot.

6. *Seed cane plot* :—Well drained soils with a loose texture are preferred. Stiff clays are unfavourable. By the middle or end of August the field is got ready by ploughing it a number of times and getting the soil into a friable condition. Cows are penned by way of manuring; and after penning, the plot is ploughed and levelled. Afterwards plough furrows at a distance of 18 inches are made in lines, so that the seedlings may be planted. The seedlings as they are removed from the seed bed in August, are transplanted in the seed cane plot in the furrows or holes made. The distance from row to row is 18 inches and plant to plant 8 to 10 inches. The seed cane plot receives oil cake thrice during its growth. The total quantity of oil cake given is from 1500 to 1700 lbs. per acre; a mixture of gingelly, groundnut, castor and pungan cake etc., is applied. The first application is within a week or ten days after planting seedlings; a month later the second dressing and again a month afterwards the final dose is given. A crop of seed cane is hoed twice, and wrapping also done twice. The first wrapping is done about three months after planting, when the internodes are visible. The second wrapping is done, a month after the first. At this time, 3 or 4 canes are wrapped together with their leaves. The fact that the seed cane crop does not grow tall, and its maximum height is only 3 to 4 feet, renders propping unnecessary. The seed beds (nursery) are watered for a period of 1½ months. After the seedlings are transplanted into the seed cane plot in August a continuous rainy

weather follows which economises irrigation. In the absence of rainfall the seed cane plot however, is irrigated once in ten days or a fortnight. In the month of May, the crop is cut and sold for seed. The portion of the crop reserved for setts for planting in the seed bed needs constant irrigations at least once a week until it is cut for setts in July. This is how setts are obtained by the regular sugarcane growers for planting their sugarcane crops.

10. Some peculiarities noted in a seed cane crop (Gonda Monjee) are mentioned below *Firstly*, the seed cane crop appears to be twelve months in duration, the regular cane crop being only a crop of 9 to 10 months, about 1½ months (July to the end of August) being in a nursery, and from September to July next being in the seed cane plot itself though a major portion of it is cut in May and sold for setts and only a small portion of the crop remaining till July *Secondly*, a seed cane crop is short not growing more than 4 feet; *Thirdly* it has a thin rind, throws out comparatively less aerial roots at fewer nodes, each clump puts forth 8 to 10 canes and *Finally* the canes of a seed cane crop are not sweet and yield less jaggery even when ten months old and are unfit either for chewing or for crushing. The fact that the seed seed-cane crop is planted late in the year, and grows during the rainy weather may account for the peculiarities in a seed cane crop and the points of difference between it and a regular sugar cane crop. The seed cane crop is affected, the ryots say by the high hot winds blowing during the summer months which dries up the moisture of the crop to a great extent.

11. *Treatment of setts for planting* :—The field having been prepared and manured, furrows are made by means of a country plough about one foot apart. The canes setts after they are purchased from the seed cane grower undergo some slight treatment — germination test — before actual planting. This consists in putting the cane setts with a sprinkling of water in small rectangular pits 6' × 2' × 6". Before the setts are put in, they are mixed, or smeared with finely powdered farm yard manure. After the pit is full it is covered with a sprinkling of the same manure and then with loose earth. In this state the setts remain 24 hours. Some ryots keep the setts in this state for even 72 hours. The setts after they are removed from the pit are planted in the plough furrows made and covered. It is usual to leave 2 to 4 inches of space between setts. After planting and covering, the field is irrigated.

12. *Aftercultivation* consists chiefly in hoeing and weeding, manuring and earthing up and formation of irrigation channels or beds for irrigation purposes, wrapping and propping.

A week after planting the field is hoed with a small hoe, the soil loosened, and weeds removed. Next hoeing is given 3 to 4 weeks after. Again when the rains commence heavily in July deep hoeing is given with a mammaty and plants earthed up and irrigation channels formed. In parts of Chatrapore taluk it is common to have one or two irrigation channels in the middle of the plot and to divide the whole field into convenient beds, so as to allow irrigation water into them by flooding.

13. *Manuring*:—Manuring the canes with oilcake is a practice followed without exception. In parts of Atagada estate gingily cake is applied; elsewhere in the northern taluks a mixture cake of groundnut, castor, pungam, etc., is applied in two doses. The quantity applied per acre is 1600 lbs. In local terms it is one bharanam, (320 lbs.) of oil cake to one bharanam of cane. (20 cents). The first application is given when the crop is a month old. A very little quantity is now given per plant. The second dose is given in the month of August when the crop is about three months old.

14. *Wrapping and propping*:—Wrapping is done mainly to prevent exposure of canes, their drying and cracking. Wrapping is commenced when at least 2 internodes appear. This is done from the middle of July. Excepting the leaves which are erect, they are wrapped spirally downwards terminating in a knot. This operation is repeated as the cane grows, and it is done from 3 to 4 times before the crop is cut. Propping the canes is not done so elaborately as in the Godavery district. The dwarf nature of the cane, raised on less rich soils than those of Godavery district, perhaps does not also demand of such an elaborate propping, as is in vogue in that district, where tall growing canes are raised on rich soils. The method practiced by Oriya ryots is different. It is easy, economical, and less expensive. It is done on a railing system, where only a small number of bamboos are required. The process of doing it is as follows. Long and stout bamboos are planted vertically along the cane rows 8 to 10 feet distant. Over these slender and tall bamboos are tied horizontally at a height equivalent to the growth

growth of the cane, excluding the tops. The leaves of each cane clump are fastened to this horizontal bamboo. Depending on the height and growth of the cane the horizontal bamboos are either shifted high or later on another series tied parallel to the first. In some villages near Hingili, (Chatrapore taluk) this is entirely given up;

15. *Irrigations*:—The first irrigation is given 3 or 4 days after planting. On an average an irrigation is given once in 10 days in the absence of rainfall. Irrigations are generally stopped a week or at least 4 to 5 days before harvest. However, in parts of Aska taluk, where cane is sold to the factory there is a practice among some cane growers to irrigate their cane crop the day previous to harvest so as to gain some more weight.

16. *Harvest and treatment of raw materials*:—The age of the crop is generally used as a guide to determine its ripeness. Harvest commences from the middle of February and finished by the end of March. Canes intended for chewing are cut a fortnight earlier. Generally buyers go to cane fields, purchase them and take them to the nearest town or shandy for marketing. Canes grown near Berhampore in the villages of Lati, Mohada and Ankusapuram, are mostly cut for chewing and very little jaggery is made in these villages. Cane growers in the neighbourhood of Aska sell their raw produce to the local sugar factory. This practice is now getting less common partly on account of the lower rates offered by the factory, for it does not pay the factory to offer high rates and manufacture jaggery, specially when there is a lot of sugar got from outside markets at considerably cheap rates and partly owing to the jaggery also selling at the same price as sugar, the ryots prefer preparing their own jaggery. Generally enough cane is cut to keep the mill working; but the cane cut during the close of the day is reserved for milling early next morning. Canes are cut to the bottom and leaf sheaths removed. The canes thus stripped and bundled are carried to the mill. In parts of the Chatrapore taluk in the villages of Sary, Sikiri, etc., women harvest the cane. These women belong to the caste known locally as "BAYURI."

17. Till recently, wooden mills were in use for crushing the cane, specimens of these are in existence in the villages of Aska taluk and are known to be still in use in isolated villages near

Gangupuram and Dowgam (Aska taluk). Wherever wooden mills are in use the cane is passed twice through the rollers. It is believed by ryots that cane juice extracted through wooden mills is far clearer, healthier, and less insipid in taste, though the quantity expressed is less.

The small three roller iron mills are in use in most of the cane growing villages. Most of the cane growers do not own them. The mill, together with the jaggery making pan—if an iron pan is used for making jaggery—is obtained on a system of hire for the whole working season. Certain merchants and proprietors of firms of Bengal—Calcutta—have got their mills and pans stocked in all the cane growing centres of the district in charge of their own agents who work on their behalf for keeping the articles, looking after them, and let them out during the crushing season and collect rent. At each cane growing centre at least 20 mills and pans are stocked. Pans are not stocked invariably along with mills, for, they are not used universally in the northern taluks. Every year each proprietor of the mills and pans stocked sends a man from Calcutta in the month of December or January to attend to any petty repairs of mills either for replacing the bearings or to attend to lathing etc. The amount of hire charged is from 30 to 35 rupees for any period up to a month. 3 or 4 ryots join together and get a mill and pan for hire. Owing to the existence of such a system locally, the local cane growers are not for purchasing cane mills and pans for themselves nor is the industry of either making mills or attending to any petty repairs in existence in the tract. The chief centres where these are stocked are Purushottapur, Boirani, Hingili and Saru in Chatrapore taluk, Kurla, and Gangupur in Aska taluk and Haripur in Mandasa estate.

18. *Preparation of jaggery*:—The construction of the furnace consists in digging a long and narrow trench 6 inches deep, 6 inches wide and 6 feet long terminating in a circular hole of about 2 feet in diameter or a rectangular pit 4 to 5 feet deep. At the top of the circular hole a wall 1 foot high is built leaving an opening about a foot below the ground level. The sides of the trench are protected by small walls 4 inch thick. On the circular hole the jaggery making pan is placed, beneath it the fire is lit, fuel being fed through the opening made. On the narrow trench small pots 6 to 8 in number are placed. The local iron pan is in the shape of a frustum of a pyramid: the top and

bottom dimensions being about 5 feet by 2 feet and $4\frac{1}{2}$ feet by $1\frac{1}{2}$ feet respectively, vertical height about one foot and the slant height being about 18 inches.

The use of an iron pan for making jaggery is mostly known throughout the area.

To begin with about 4 or 5 potfuls of juice are first poured in the pan and the boiling started. Afterwards as the juice is expressed from the mill it is brought and filtered immediately in the small pots placed on the narrow trench where the juice gets a preliminary heating. As more juice is expressed the contents of the small plots are emptied into the big pan or earthen pots boiled on the circular hole while the small pots are again filled with juice. This process continues for about 4 to 5 hours and then stopped so that after the necessary evaporation and boiling the syrup gets concentrated and jaggery made. Liming the juice is common but removal of scum and albuminoid matter is not done. The sign of sufficiency of boiling is that, if a small quantity of syrup be taken out with the thumb and another finger and drawn out the resultant curved thread like formation of the syrup between the thumb and the finger should not break. After thus determining the sufficiency of boiling, the hot jaggery is put into pots by means of coconut shells with wooden handles. Before the jaggery is put into pots they are measured with water as to their capacity in "Addas"—a local measure equivalent to $\frac{1}{4}$ of a kuncham. The capacity is then marked on the pot so that at a later date when it is marketed, the price of the pot can be fixed according to the number of Addas sold per rupee. This method of measuring jaggery is peculiar to Ganjam. The jaggery prepared is black in colour and liquid in form. The quality is however preferred by the Oriya population as it is believed to be sweeter than the jaggery of Vizagapatam district brought to Berhampore market for sale. On an average about 100 to 120 pots per acre are obtained and each pot weighs from 30 to 35 lbs. A pot measures locally 16 to 20 addas. The cost of a pot varies from 3 to 4 rupees which means a total outturn of 300 to 480 rupees per acre.

19. *Preparation of brown sugar*:—In the process of manufacture of brown sugar no machinery is concerned. Though no detailed description of its preparation can be given here suffice it to say, that it is done on an ordinary hearth, with the

boiling of raw jaggery. The juice is boiled milk added in the course of boiling impurities removed and by concentration and crystallisation brown sugar is obtained. It is then put into conical shaped pots specially made. At the time of marketing, the pots are broken and good crystalline brown sugar in moulds of conical shape is sold. When made into powder it turns into granular brown sugar. Each mould weighs from 5 to 8 pounds and is sold at the same rate or 6 pice more per pound than the white sugar. It is generally believed that this brown sugar is sweeter than the factory made sugar. This may perhaps have a greater vitamin content and thus may be healthier than the white sugar.

EXTRACT

Agriculture in Poetry.

SEASONAL EPICS AND VIGNETTES.

Virgil's Classic.

What minor poet is there that has not seen a ploughman silhouetted against a skyline? The verse of all ages is full of blithely-singing milkmaids and garrulous shepherds; the plough and the harvest provide half the metaphors of every language. The fashion for sophisticated shepherds and shepherdesses that began with Theocritus and ended in Dresden china soon after Louis XIV. is gone out now, though smocks and the simple life are always with us.

Theocritean idylls and Court Masques are not, however, the only poetic form that agriculture has taken; but it is surprising how little else poets have done with it. Agriculture does not seem to inspire poets just for itself; it provides them with a background and with a magnificent array of symbols. But it does not seem to move them as an imaginative, thought-creating thing as a triumphant human activity. In agriculture men are so much the instruments of Nature, so small and impersonal against the huge wheeling of the seasons, the birth and death of Nature, the infinite labour and sorrow that the fulfilling of her demands imposes. Poets have always tended to be rather frightened of agriculture. Crabbe, writing in 1807, said:—

I grant indeed that fields and flocks have charms
For him that grazes or for him that farms;
But when amid such pleasing scenes I trace
The poor laborious natives of the place,
And see the midday sun, with fervid ray,
On their bare heads and dewy temples play;
Then shall I dare these real ills to hide
In tinsel trappings of poetic pride?

It is this wheeling of the seasons that gets into poets' heads. They write long didactic narratives about the soil and harvest and the hardships of winter, using the phases of agriculture as the diateme. No one has yet supplanted Virgil's "Georgics" as the great agricultural poem. English literature's chief counterpart to them is James Thomson's "The Seasons."

James Thomson.

Large sections of that work are straight translation of Virgil (especially of the famous "O fortunatos nimium sua bona norint Agricolas..."); but it is mostly occupied with the seasons and the praises of industry and descriptions of storms arousing philosophical reflections. He has passages on the plough as a great historical symbol:—

In ancient times the sacred Plough employed
The kings and awful fathers of mankind
...Ye generous Britons! venerate the plough!

And in company with nearly every one else in the confirmedly city dwelling 18th century he was convinced that kings' palaces are nothing to a labourer's cottage for real peace and piety.

Agriculture has many beautiful and picturesque scenes to catch the poet's imagination-hay-making and harvest festivals, of course; but much more frequently poems have been written about gleaning-Ruth amid her alien corn, most recently metamorphosized into Mr. Blunden's "Hard clucking dames in great white hats"—or about sheep-dipping or shearing ("...Ere the soft fearful people to the flood Commit their woolly sides"... "Others the unwilling wether drag along; And, glorying in his might, the sturdy boy, Holds by the twisted horns the indignant ram"—from Thomson, as well as Keats's "While ever and anon to his scorn peers A lamb goes bleating") and shepherds, idyllic or taciturn but always old. Milton's picture in "L'Allegro" is a complete vignette of the poet's agriculture:—

While the plowman neer at hand
Whistles o'er the Furrowed Land.
And the Milkmaid singeth blithe,
And the Mower wets his sithe,
And every Shepherd tells his tale
Under the Hawthorn in the dale.

Grey, taking in his *Elegy* most of all about the life of country people, never comes nearer to the actual facts than this:—

Oft did the harvest to their sickle yield,
Their furrow oft the stubborn glebe has broke.
How jocund did they drive their team a field!
How bowed the woods beneath their sturdy stroke!

In fact, probably the most perfect agricultural poem in English is Keats's "*Ode to Autumn*":—

...Whe hath not seen thee oft amid thy store?
Sometimes whoever seeks abroad may find
Thee sitting careless on a granary floor,
The hair soft-lifted by the winnowing wind;
Or on a half-reaped furrow sound asleep,
Drowsed with the fumes of poppies, while thy hook
Spare the next swathe and all its twined flowers;
And sometimes like a gleaner thou dost keep
Steady thy laden head across a brook;
Or by a cyder-press, with patient look,
Thou watchest the last oozings, hours by hours.

There have been many writers in English who have lived agricultural lives and filled their poems with minute precise images of the fields and woods. John Clare and Burns are alike in their use of agricultural images without either of them writing directly agricultural poems though they are fundamentally unlike in that the better poet is the worse countryman. William Barnes's dialect poems, like those of his fellow Dorsetman, Thomas Hardy, are never far from the ploughed hill sides and sheep-haunted downlands of Wessex. But there is little enough agriculture in 19th century poetry. Wordsworth wrote a poem to an Agricultural Implement, but it was a spade belonging to a friend at whose house he had done an afternoon's gardening. The Victorians required more soul and emotion, as the Elizabethans more blood and passion, in their poems than the short and simple annals of the plough could provide, though minor poets of all ages are consistently faithful to the soil.

A modern Epic.

In this century, tired, perhaps, of the mechanical wonders of the last, poets have turned again to "rich, loamy fields and rooks and sheep". Mr. Gordon Bottomley has a poem called "*The Ploughman*":—

Under the long fell's stony caves
The ploughman going up and down
Ridge after ridge man's tide-mark leaves,
And turns the hard grey soil to brown.
Striding he measures out the earth
In lines of life, to rain and sun;
And every year that comes to birth
Sees him still striding on and on....

But there has also been Miss Sackville West's prize poem, "*The Land*." This again is a seasonal poem, though it contains much practical advice (not occasionally unreminiscent of the doggerel of Tnssor, who translated the whole of the "*Farmer and Stock-breeder*" and the *Farmers' Almanack* into rhymed couplets in the 16th century):—

I sing the cycle of my country's year,
I sing the tillage and the reaping song,
Classic monotony, that modes and wars
Leave undisturbed, unbettered, for their best
Was born immediate, of expediency
His way (the farmer's) is still the obstinate old way,
Even though his horses stare above the hedge,
And whinny while the tractor drives its wedge
Where they were wont to serve
Still is his heart not given
To such encroachments on a natural creed

Which is possibly somewhat unfair to the industry, even considering the recent "laughter at Ipswich."

But nowadays there is not the universal agricultural scene that there was in Lanland's day when, under the feudal system, the basis of the nation's whole life was the land. His "*Piers Plowman*" contains what is undoubtedly the first agricultural picture in English poetry.

Now is perkyn and his pilgrimes to the plowe faren
To erie his halve acre, holyn hym many;

And elsewhere:—

I have an half acre to erie bi the high way;
Hadde I eried this half acre and sowen it after,
I wolde wende with you and the way teche.

Crabbe, after saying very nicely what is still the one thing
that every one knows about farmers:—

Our farmers round, well pleased with constant gain,
Like other farmers, flourish and complain—
... how strange it is that men
Who guide the plough should fail to guide the pen!

But it is, of course, not really strange. The pen may be
mightier than the sword; but if the sword be beaten into a plough-
share, then it is quite a different matter. *O fortunatos sua bona
norint.*

(From a correspondent, "The Times" Agricultural Number
Dated April 3, 1928.)

Death Duties.

A Severe Burden:—When the Estate duty was first imposed
by Sir William Harcourt in the budget of 1894, there were prob-
ably few who could foresee the uses to which this new instrument
of taxation was to be put by future Chancellors of the Exchequer.
The enormous increase of these duties during the last 20 years
has pressed with particular severity upon agricultural estates. One
of the reasons for this is that land is of the very nature the least
liquid form of asse and is consequently more difficult and expensive
to realise than investments in stocks and shares. The main reason,
however, is that the method of valuation substituted by the Fin-
ance Act, 1910, for the 1894 basis, having the effect, as it does, of
valuing a wholesale business at retail prices, is most inequitable to
the owners of agricultural land particularly those who wish to
retain their estates in tact. Agricultural landowners in the past
have accepted a lower return on the capital represented by an
agricultural estate than is the case with other investments and
consequently the valuation figure, which is not based on the
actual net return is disproportionately large.

Valuation Methods:—Moreover, the practice being to value,
an agricultural estate as if it were sold in lots, the aggregate valu-
ation is almost invariably much higher than the sum which the
estate as a whole would fetch in the market. When a forced sale
takes place the most easily salable lots are disposed of to pay
Death Duties, leaving the remainder of the estate, comprising the
less salable lots with a greatly diminished value. The portions
left on the owners' hands almost without exception include the
mansion house which in certain localities can only be disposed of
at a break-up price, representing only a small portion of its value
as part of an adequate estate. The result of these heavy and
inequitable Death Duties is that, unless other resources are avail-
able, few estates can survive more than two or three generations,
especially since the protection afforded to estates in settlement
was largely withdrawn in 1914.

It is true that under Finance Act, 1925, agricultural land was
excluded when the scale of graduation for Death Duties was
steepened, but it did nothing to relieve the serious position as it
was before the passing of the act, and the duty on the agricultur-
al estate valued at £100,000 still stands at 14 per cent and on an
estate worth £500,000 at 25 per cent.

The cumulative effect of Death Duties is without doubt
the main cause of the break-up of landed estates. That many of
the holdings thus disposed of have been purchased by the former
tenants is apparent from the official returns of the amount of land
owner occupiers in England and Wales, which increased from
2,890,000 acres in 1913 to 6,70,000 acres in 1924. The great
increase in the farmer owner class can be attributed to two main
cases—one, the innate desire to possess one's own free-hold; the
other, the necessity of purchasing in order to retain their homes.
This great change, which amounts in fact to a revolution in agricul-
tural organization has unfortunately not been accompanied by the
provision of a satisfactory substitute to carry out the functions of
the old landlord in supplying cheap capital for maintaining the
permanent equipment of the land.

Rural industry is no longer able to obtain the necessary capi-
tal from the land owner at the old philanthropic rate of interest,
and the owner-occupier is beginning to discover to his cost that
borrowed money is the worst of landlords. At the passing of an

estate by death the tenant is apt to be faced with the alternative of either buying his holding or finding other employment. In order to preserve his home he purchases often by borrowing. He now finds himself unable to perform as owner the primary works of maintenance which in the old days were done chiefly by the landlord, for the tenant farmer's resources were used almost entirely as working capital. The result is that not only does the land deteriorate, owing to the lack of capital to keep it in productive condition, but the farmer also finds his credit resources wholly inadequate to tide over a period of bad years.

(A correspondent. The Times Agricultural number April 3, 1928).

Their Severity—A Concrete Example :—

Crushing as these duties are in the most straightforward and simple successions, there are nevertheless other circumstances in which they become nothing more or less than an intolerable extortion. I myself was a victim of such circumstances, and though I have no desire for my personal grievances or my personal affairs to gain publicity, I think some useful purpose may be served at this time by recounting the facts of my case. It cannot be by any means unique.

On the death of my father in 1914, I inherited under his will the estate of Alton Albany, in South Ayreshire, then valued at £ 33,674. Had the estate been free from any paramount charge, I should have been liable for duty on this £ 33,674 and no more. The estate was however, subject to annuity of £ 810 per annum, charged by my grandfather in favor of his widow who was aged 82 years at the death of my father. I was accordingly in this instance asked to pay duty on the £ 33,674, less the capitalised value of the annuity ascertained with reference to the age of the annuitant. This "capitalised value" was worked out at £ 2,606 (rather less than 4 years' purchase), and duty was paid by me on £ 31,068.

My grandmother died in 1920, and I then tendered duty on this £ 2,606, but in reply received a claim for duty on £ 22,680, being the capital value of a slice of the estate sufficient to produce the annuity in perpetuity. Thus, although the estate to which I succeeded was valued at £ 33,674, I was compelled to pay duty firstly, on £ 31,068, and, secondly, on £ 22,680—total, £ 53,748.

The injustice is obvious and the absurdity is equally so when it is considered that if I had inherited the estate free from any annuity the sum taxable would have been £33,674 only, although I should in those circumstances have been much better off and consequently better able to meet a large claim for death duty.

I may say that before I paid the second claim for duty I took the opinion of counsel of great eminence at the Scottish bar. His opinion was that the claim of the inland revenue department "could not be successfully resisted."

(Leut. Commander, G. Hughes Onslow, in Scottish Farmer dated 17-4-28).

India A Grave-yard

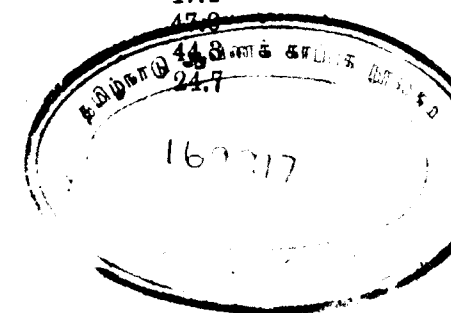
In 1918 Lord Sinha who was then a member of the Imperial War Cabinet made a statement to the Overseas Press in London and remarked that :—

"It was not a constitution alone that was wanted for India but contentment and prosperity. However efficient the system of Government might be in India, it would be generally admitted that India was a very poor country, and unless the whole policy of *laissez faire* was changed, was likely to remain so. India had not been prosperous for a long time past, and was not prosperous now.....Literally millions in India were on the border of starvation. Half the population never had a full meal in the day, and means must be found to remedy this state of affairs."

This has affected the average length of life in India. The people are gradually becoming dwarfs and weaklings. They are losing their vital vigour and are falling easy prey to diseases. *The longevity of the Indian people to-day is only 24.7 years.*

Herewith a table giving the relevant and comparative figures :—

Country.	Average length of life.
1. England and Wales	51.5
2. United States	50.0
3. France	48.5
4. Germany	47.4
5. Italy	47.0
6. Japan	46.8
7. India	24.7



That means premature deaths in the country. The infant dies. The mother and her family suffers.

The mortality rate is very high. It is 30 per thousand.

As compared to other countries it is :—

Countries.	Population.	Rate.
1. New Zealand	12,00,000	9.5
2. Austria	55,00,000	10.5
3. New Foundland	2,50,000	10.6
4. U. S. America	10,00,00,000	12.9
5. Norway	26,00,000	13.2
6. Sweden	60,00,000	13.8
7. United Kingdom	4,54,00,000	14.6
8. Belgium	75,00,000	15.2
9. Germany	6,00,00,000	16.2
10. India	31,90,00,000	30.0

Madras Crops.

The *Cotton* crop of 1927-28. Intermediate monthly report. Good rains were received in April in the Central districts and the South and summer picking of Cotton is expected to be satisfactory.

Gingelly crop of 1927-28-late crop. Intermediate monthly report. In Ganjam and Vizagapatam, rains in April damaged the late sown gingelly crop. The crop is expected to give a normal yield in most of the other districts.

Paddy crop of 1927-28-Second crop. Intermediate monthly report. Second crop paddy is being harvested in parts. In the Circars and Deccan, the yields are normal. In Nellore, the yield of early sown crops is below normal owing to insect attack and scarcity of water but late sown crops are expected to give normal yields. The yield was below normal in Chingleput, South Arcot, Chittoor, and North Arcot.

† N. B. The reports were dated 12th May 1928.

UNIVERSITY OF MADRAS.

B. Sc. (Ag) Degree Examination.

PRACTICALS.

Part I.

Chemistry.]

[11th April 1928, 10 A. M.—4 P. M.

1. Estimate gravimetrically the quantity of sulphuric acid contained in a litre of given solution; and calculate the amount of water which should be added to a litre of the solution to make it exactly semi-normal.

II. Examine solid given qualitatively for not more than 2 bases and 2 acids.

Chemistry—12th April 1928.

III. Oral and VivaVoce examination and scrutiny of Practical Chemistry note books.

Botany.]

[14th April 1928, 1—4 P. M.

1. Give a complete botanical description of specimen A and identify it giving reasons.

2. Prepare sections of the material B and explain the structures by means of drawings.

3. Write critical notes on :—

C, D, E, F, G, H, I, J.

Engineering]

[16 and 17 April 1928.

1. Compass :—Observation and plotting of angles of a small circuit.

2. Plane table—Fixing points by intersections.

3. Levelling—Finding values of benchmarks and vivavoce in adjustment of instrument.

4. Drawing stress diagrams and from specification and taking out quantities of a culvert tunnel and questions on power development.

Animal Hygiene]**[18th and 19th April 1928.**

1. **Casting and securing cattle.**
2. **Handling of cattle and sheep.**
3. **Dissection and identification of internal organs.**
4. **Identification of instruments, appliances and drugs.**
5. **Detection of lameness and diagnosis of minor ailments in cattle.**

Zoology]**[19th and 20th April 1928.**

1. (a) **Make a dissection of the animal supplied (Earthworm) to expose the alimentary system and prepare a drawing naming the parts.**
(b) **Mount on a microscopic slide a few setae of the worm.**
2. (a) **Dissect out the mouth parts of the insect provided (Cockroach) and arrange them on a slide; make a diagram naming the different parts.**
(b) **Mount one of the legs of the insect on a slide and prepare a diagram naming its parts.**
3. **Identify specimens numbered 1—20.**

Zoology]**[20-4-1928.****Oral examination and examination of insect collections.****Agriculture.]****[21st April 1928, 7—10 a.m.**

1. **The field has received good tilth. Prepare the plot for transplanting ragi or onions.**
2. **Cut two rows of guinea grass in 61.**
3. **Identify the following :—**
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.
4. **Give approximate values of the following :—**
 1. **A double bullock cart (2) a yoke for plough (3) Spare share (4) Spare mould board and (5) Spare blade for Victory plough (6) Spare share for steel eagle plough.**

5. **Give the area covered by the following in a day of eight working hours.**

(1) Country plough (2) ordinary guntaka (3) Steel eagle plough (4) Disc Harrow (5) Dantulu (set of three) in cholam field. (6) Sowing cholam with a—tined drill. (7) One woman reaping paddy (8) One woman reaping P.M. cholam (grain crop) (9) Irrigation with two mhotes from 5 well for transplanting ragi in F No. 18. (10) Irrigation from 57 well Engine for giving second irrigation for cambodia.

6. **Estimate in detail the cost of providing an additional mhote to the four mhote well and state what additional sum will be required if a leather mhote rope and a roll easy mhote wheel are used. Necessary masonry structure is already on the well.**

Botany I.]**[24th April 1928, 1—4 p.m.**

1. **Describe fully in technical terms the different parts of A and B and give sketches of the floral parts in A.**
2. **Make microscopic preparations of C so as to show its structure. Draw and name the parts.**
3. **Write notes on the morphological features of D, E, F, G.**
4. **Identify the materials in the watch glass.**

Botany II]**[25th April 1928, 7—10 a.m.**

1. **Make microscopic preparations to show details of structure of the fungus in A and identify. Make sketches of the parts and name them.**
2. **Cut Sections of B and explain with sketches the structure and arrangement of the special excretory tissue as well as the nature of the contents in the same.**
3. **Identify giving the chief reasons C, D, E and F.**
4. **Viva voce.**

Agriculture I.]**[26th April 1925.**

- I. **Prepare butter with the cream provided.**
- II. **Assemble the plough parts and gather in Field No. 44.**
- III. **Analyse the given mixture of seeds qualitatively. A few seeds of each are to be mounted and named.**

IV. Judge the samples of (1) Paddy (2) Jaggery (3) Cotton.

V. Prepare cropping scheme for the main crop season (from 1st May 1928) of the Central Farm, Garden and Dry lands.

VI. Orals.

Agriculture II] [27th April 1928.

I. Fit up gorru and sow cholam (Periamanjil for grain) in the 25 cents plot indicated.

II. (1) What is the calendar of operations in a sugarcane field planted in February from planting to milling.

(2) What is the cost of picking kappas from an acre of Cambodia crop?

(3) What is the effect on jaggery if the canes lodged badly? How would you set it right?

(4) What is the economy of thrashing cholam with the threshing roller over threshing under feet of bullocks?

(5) 1000 cubic yards of straw of a new stack cost Rs. 80 what would you pay for the same volume of straw from a stack six months old.

III. Note the cost of the following :—

(1) One jaggery mould (babool wood) with 1000 holes 1 inch square.

(2) Loss in weight of cattle dung 50 tons by keeping in an open pit for 3 or 4 months in the open yard.

(3) Maintaining a Kangayam bull calf one year old for 2 years.

(4) Raising paddy seedlings to transplant two acres.

(5) Ginning 500 lbs. uppam lint in a machine gin and a hand gin.

IV. Prepare a cultivation sheet for guinea grass field of 1½ acres for one year planted on 15th April 1927.

V. Identify samples 1 to 10.

VI. Orals.

Chemistry.] [28th April, 10—4 P. M.

1. Estimate gravimetrically the lime content of Solution I.

2. Estimate phosphoric acid in Solution 2.

3. Oral.

Chemistry.]

[30th April 1928, 11 A.M.—4 P.M.

1. The given mixture contains two non-nitrogenous organic substances. Identify and estimate them.

2. Oral.

B. Sc. (Ag) Results.

(Published on 8th May 1928).

LIST OF STUDENTS WHO PASSED IN PART II.

Ambikacharan K; Gopalan R; Krishnan K; Krishna Reddi T; Krishnaswami V; Kunhikrishnan Nambiar K; Muttuswami S; Natesa Ayyar P. K; Padmanabhan M. K; Padmanabha Ayyar B. N; Ramabhadran G; Ramachandra Rao S; Raman Moosad C; Ranganathan K. S; Sundaresan G; Uttaman P; Vaidyanathan M; Venkatacharya B. V; Venkatasubrahmanyam M. K.

LIST OF SUCCESSFUL STUDENTS IN PART I.

Abraham M. C; Krishnan K; Sundaresan G; Uttaman P; Anantapadmanabha Pillai; Annamalai C; Balasubrahmanyam T. N; Gopala Marar K; Govindakutti Kurup P; Jivan Rao M; Kalimuttu M; Kalyanasundaram K; Krishnamurti P. S; Krishnamurti Rao R. S; Kunhikanran Nambiar K; Mukundan T. K. Muttunayagam A. P. A. Brito; Narasimha Rao M. P; Narayana Menon V; Narayanaswami P. S; Natarajan V; Natesan K. V; Raghunathan A.K; Ramadas A; Ramaswami S; Ramayya Chetti M; Ranganathaswami G; Rangasami T. V; Saldanha R. J; Sanjiva Chetty K; Seshadri Sarma P; Shanmugasundaram D; Somayya M; Subrahmanyam K. H; Subrahmanya Sarma A. H; Sundaram S; Suryanarayana J; Venkatasubrahmanyam P. S;

LIST OF STUDENTS WHO FAILED IN PART I IN ONE SUBJECT ONLY.

Krishnasami P. N; Muhammed Abbas B; Ramasami R; Sundaram T. S; Venkatesan K. R;

Departmental Notifications.

GAZETTED :—

Leave, transfers etc.—Mr. R.C. Broadfoot, Deputy Director, VI circle, to be Cotton Specialist, vice Mr. G. R. Hilson on leave. Mr. Saadat Ullah Khan, Deputy Director, V circle, to the VI circle. Mr. N. S. Kulandaswami Pillai, Assistant Director, Tanjore, to be Assistant Director in charge of V circle.

NON-GAZETTED :—

Appointments, transfers etc.—The following officers working in the Sugarcane Expert's section are reabsorbed into the department and posted as follows :—Mr. G. Ganapathi Ayyar, to be Assistant IV grade Agricultural Chemist's section; Mr. P. Gowrisankara Ayyar, to be Agricultural Demonstrator, V grade and posted to V circle; Mr. K. Achyutha Nambiyar, to be Assistant Demonstrator, V grade and posted to VIII circle; Mr. L. K. Narayana Ayyar to be Assistant Demonstrator, V grade and posted to V circle. Mr. A. Ramalinga Ayyar, Demonstrator, to V Grade Sholavandan. Mr. N. C. Tirumalai, Demonstrator, V Grade to Koilpati Cotton Station. Mr. V.G. Danakoti Raju, Farm Manager, Guntur to Central Cattle Farm, Hosur. Mr. L. Narasimbachari, Demonstrator, to be Manager, Guntur.

Leave etc.—

III CIRCLE:—Mr. K. T. Bhandary, Demonstrator leave on average pay for 15 days from 22nd May. Mr. S. M. Kalyanarama Ayyar Cotton Assistant leave on average pay on medical certificate for one month from 20th May.

IV CIRCLE :—Mr. M. A. Balakrishna Ayyar, Demonstrator, leave on average pay for 15 days from 4th June. Mr. A. Ramaswami Ayyar, Manager Palur, leave on average pay for one month from 1st June.

VI CIRCLE :—Mr. P. R. Subramanya Ayyar, Assistant Demonstrator, leave on average pay on medical certificate for one month from 16 April.

EDITORIAL.

Hobby.—Most of the discoveries and inventions that have enriched human knowledge in the modern world have been made by persons who had their own 'hobbies.' A hobby is one's favourite subject or profession that is not one's main business. No one in India can gauge the amount of knowledge in multitudinous departments that has been accumulated by the most busy men with hobbies. Witness the publications of the Royal Asiatic Society of Bengal and of hosts of other societies both at home and abroad. These bear evidence to the undivided love each has given to his hobby besides doing his legitimate work satisfactorily. The intellectual detachment that ensues when pursuing his hobby invigorates the man as well as economises human labour, and persons with such hobbies never complain of want of time or overwork. In our own presidency within a decade or two, we have had many examples of such men. A few that may be mentioned are the late Mr. L. D. Swamikannu, Mr. Allen Butterworth, Mr. N.S. Brodie and the late Mr. J.J. Cotton. They have enriched astronomy, botany, entomology and historic researches respectively. But such persons are getting rare mainly owing to the aimlessness of present day education and it behoves educationists in India not to neglect this aspect but to introduce changes in the school and college curricula which will keep aloft certain ideals for students to look and live up to. This is especially so in professional colleges where students stand the risk of getting their intellectual, aesthetic and sporting propensities atrophied by a strenuous application to and appreciation of mechanical powers.

But with a desire for development on all sides it should be easy for a trained agriculturist to be more at home in and realise quicker any line of work he may take up as a hobby if he would only except the barren and controversial questions of politics.

Reduction in Railway freight.—It is announced that on the recommendation of the Madras Government the Railway Board has agreed to the reduction of railway freight on manures carried over the M. S. M. and S. I. Railways and cultivators should note and feel thankful for this reduction. Recently manure firms have been more than busy with their trade and the concession granted should help them to sell the manures at a cheaper

rate and effect a larger distribution amongst the ryots. We hope that the Railway Board would also examine the question of freight on cereals and oils and such other necessities of life so as to bring real relief to the poor labourer. For, the present rates are anything but equitable and oblige producers to sell their wares at less than reasonable profits.

University Percentage of Marks for Success:—During the past 70 years that the Madras University has been in existence several changes have occurred in the curricula of studies and the standards fixed for pupils to get through their examinations. With an ever-growing increase in the number of students that appear for several examinations and the almost inevitable diversity of views amongst setters of questions and valuers of papers, results of examinations are likely to show a tendency for variation from year to year and with each examination. In the case of Arts and perhaps also of one or two professional examinations which have been long held, traditions have grown round but with other professional examinations which the University has recently started the first stages of development have yet to be gone through, and for this to become possible it is essential that the Senate should insist on almost a uniform standard of valuation and percentage of marks which has been found satisfactory so long in the case of Arts examinations. We deliberately make this statement for, a reference to the University calendar Vol. II 1927-28 shows the disparity that exists between one examination and another for example, the B. A., B. Sc., Engineering, Medical and Agricultural. Though the question of suggesting changes should be largely left and rightly so to the Boards of Studies, and Examiners and other smaller groups of University bodies, the general policy must be laid down in unmistakable terms by that sovereign body in higher education viz. the Senate. To point out an instance which works as a hardship we may quote the minimum percentage of marks necessary in each subject and in the aggregate in Part II in the B. Sc. Ag. examination Botany 33 Chemistry 33 Agriculture 33 and aggregate 45, the maximum respectively being 300, 300 and 450. The tendency of valuers being ordinarily to give about the minimum to candidates of average ability the large disparity in the subject minimum and the aggregate minimum works out to their disadvantage especially when the maximum marks for the different subjects are not the same but have a wide range. We grant that in this professional

college for agriculture predominating importance should certainly be given to the subject of agriculture and as such the minimum for pass and the maximum marks on this subject should be more but this should not be made to work in an indirect way for the failure of those on borderland whose claims are not unworthy in a scheme of university education. By all means a distinction and a sharp one too may be attempted in picking out students of exceptional abilities from plodders. In that case, the percentage for the former class may be raised sufficiently high so as to separate the sheep from the goats but we are not sure whether after all very nice distinctions in professional careers like the Agricultural, Engineering and the like are a sure test of the future of the candidate, examinations forming only a beginning and experience alone determining the future course a man's knowledge will take though one with abilities may have a better start but may prove a hopeless failure if he is not hardened in the school of experience. We may add that genuises are too few in this world and it has to get its supply of workers from average men chiefly. We would therefore suggest to the authorities concerned that either the minimum in each subject be raised so as to reduce the difference between these and the aggregate minimum for ordinary pass or request them to abolish the aggregate minimum and make the subject minima alone which may vary if necessary with each subject eligible for a pass.

We commend this aspect of the question to the kind attention and notice of the Boards of Studies and of Examiners and hope they will soon take it up for its being definitely settled before the examination of 1929. We are aware that owing to paucity of funds, the Senate meets only twice a year and it will take time for formalities to be gone through before the question is placed before the Senate. We would therefore earnestly request that the Board of studies will consider this subject early and send in their recommendation in time for the Senate to take it up. With our Director—Mr. R. D. Anstead in the Senate and Principal Tadulingam as Chairman of the Board of Studies both well conversant with the working of these regulations as affecting the B. Sc. Ag. examinations, this question, we are sure, will receive a sympathetic and satisfactory solution.

The 17th College Day and Conference:—We are happy to learn that this year's College Day and Conference will be blessed with the presence of the Governor and that His Excellency

Viscount Goschen has also been most graciously pleased to preside at the opening session on Monday the 9th July. His Excellency's tenure of office is associated with two notable events in recent British Indian History in this province. The one is the advent of the Royal Commission on Agriculture and the other is that of the Simon Commission. His Excellency, before he leaves the shores of India next year, will have time to see effect given to recommendations of the Agricultural Commission for which His Excellency's Government must have contributed materials and their considered views, so far as this province is concerned. Madras being chiefly an Agricultural country deserves special handling and guidance and it is largely left to those nobleminded Englishmen into whose hands are entrusted her destinies from time to time to make her contented and happy and help her keep wolf from the door. Being a landlord himself, His Excellency has always taken an abiding interest in agriculture and this he has testified on several occasions and in several ways. It was only in July 1926, His Excellency was pleased amidst very strenuous calls on his time as head of the Government in this transition period, to open the Freeman Building and the agricultural exhibition for which we are grateful. The Union also feels thankful to the Director of Agriculture, Mr. R.D. Anstead for persuading His Excellency to come to the College a second time to preside over this conference and see for himself what this meek department has been and is capable of doing for the ryot whom everyone claims to, but scarcely does be—friend. His Excellency's visit in July will be further remembered as the occasion on which motor exhibition cars will begin to function as a sure and quick means of getting into closer touch with the ryot.

We hope that both departmental officers and members of the public will assemble in large numbers at the conference and witness the unique function.

Copy of the programme is printed elsewhere.—Lower Subordinates will also hold their conference on the 14th July under the Chairmanship of Principal Tadulingam.

The Ploughman's Burden. In every country which has been mainly agricultural, public charges have to be met from taxation largely derived from land and the transition from this stage to industrialisation marks the progress which the financiers make in reducing the burden on the land and tapping other sources of income. However, most countries where democracy is supreme

have been chary in picking out hidden sources but have always insisted on keeping necessities of life within the easy reach of even the most downtrodden or helpless. Look at the tremor with which successive Chancellors of Exchequer in England approach the subject of taxation of bread and other necessities of life whatever the political brand they may put on. This is as it should be, for after all what has been gained by such subterfuges will largely have to be given away in giving relief to unemployed, invalids, etc. Fortunately in our own country the percentage of taxes which land has been made to bear to general revenues has shown a steady decline, now standing somewhere at 40. Still absence of industries and unequal distribution of the burden of taxation act as a handicap for the better amelioration of a larger percentage of the population and we hope that the Simon Seven will not neglect this aspect of securing contentment of the Indian people to what little extent that is possible, for after all hunger and thirst determine the policy of the submerged that are found in large numbers in every country. The ploughman must get some relief though owing to the multitudinous tongues that claim to speak on his behalf this may escape the notice of all except very shrewd observers. We submit in this connexion that associations of persons connected with and working on land are almost non-existent in this country, to make their voice effectively felt. We are aware, however, that a few associations of landlords and zamindars exist in some provinces but they only form a part and not the whole of the real agricultural community.

New Sources of Taxation:—We make no apology for coming back to the subject more than once because of the absence of full knowledge which seems to characterise certain economists in the country who have suggested "Death Duties" as an easy source of taxation. Even in England where these have been in existence since the time of Sir William Harcourt they have proved the main cause of the break up of many landed estates the deplorable effects of which are daily becoming manifest by undercapitalisation in farming, constant stagnation in the agricultural profession and the acute depression farmers are experiencing with little hope of avail from the Government or the now becoming defunct landed aristocracy. A concrete example of the severity is quoted under the head "Death Duties." We make a present of this to those whom it concerns most.

The Madras Sukrand:—For a few years the question of watering hungry lands on a large scale has become the considered policy of the Government of India and local Governments. The Lloyd Sukkur Barrage scheme in Bombay for diverting the waters of the Indus for portions of districts in Sind and Mirpurkhas State is one such the cost of which when completed may approach the figure of 8 to 10 crores of rupees. This may look a very huge sum but the incalculable benefits to be derived, if the scheme succeeds, by the large mass of people in that province and elsewhere cannot be sufficiently visualised at present; for human nature being what it is, every generation has an eye always for the present and looks with askance on schemes put forth by farseeing men for generations yet to be born. In our own province the Cauvery--Mettur Project may, if the experience of past engineers and present advisers of Government is not untrustworthy which we hope it is not,—may become as fruitful as the Godavari and Kistna Irrigation projects for which the late Sir Arthur Cotton was almost impeached by Sir Richard Temple and his Government. But so as to forestall what changes are likely to result by the fruition of such projects, it is necessary that local cropping and agricultural prospects of the tract which they are hoped to benefit should be investigated *pari passu* with the work on the projects so that when they are completed sufficient experience may have been gained for giving a definite lead to local ryots in the matter of agriculture. The scheme of work which has been started at Sukrand in Sind the first report of which has been published may serve as an example to follow and it will not be too early to open a farm or two for such a purpose in the hungry tracts of Pattukottai taluk in the Tanjore district which the Cauvery—Mettur project is mainly intended to ameliorate. We hope Mr. D. G. Munro, Deputy Director of Agriculture—who may shortly take up his duties as a special officer for working out a programme of development for the whole department including research sections for the next 5 years will be supplied with full information both by people in the tract and officers concerned and be enabled to suggest suitable proposals. The opening of a farm in this tract for such investigation may, we also believe, secure the approval of the Labour Commissioner who is intent on reclamation of Kallars an appreciable portion of whom are struggling in this tract with unrelenting Nature.

(v)

The Journal of

THE

Mysore Agricultural & Experimental Union

BANGALORE.

A Quarterly Journal published for the Union by
an Expert Board of Editors.

Chief Editor—Dr. B. Narasimha Iyengar, B.A., Ph. D.,

Agricultural Chemist in Mysore.

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(vi)

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(vii)

SEVENTEENTH COLLEGE DAY AND CONFERENCE. PROGRAMME.

SATURDAY.

JULY 7TH 3 P. M.—Sports. Union "At Home."
Mrs. Anstead gives away the Prizes.

SUNDAY.

JULY 8TH 5 P. M.—Hockey Match.

MONDAY.

JULY 9TH 11 A. M.—His Excellency Viscount Goschen, G. C. I. E.,
G. B. E., V. D., inspects Exhibition.

NOON to 2 P. M.—His Excellency opens Conference.
Reading of the Annual Report by the Secretary.

Address of Welcome by Principal Tadulingam
Presentation of College Medals and Prizes by His Excellency.
Reading of papers and discussion.

Vote of thanks to His Excellency by the Director Mr. R. D.
Anstead.

Group Photo.

TUESDAY.

JULY 10TH FORENOON.—Visits to Laboratories & Breeding Stations.
" 1 TO 4 P. M.—Conference II Session.

" 9 P. M.—Entertainment (Admission by tickets.)

WEDNESDAY.

JULY 11TH FORENOON.—Visits to Breeding Stations and Exhibition.
" 9 A. M.—Joint Conference of Deputy Directors and Research
Officers with officers of Nitrams Limited.

" 1 to 4 P. M.—Conference III Session.

THURSDAY.

JULY 12TH FORENOON.—Visits to Laboratories and Exhibition.
" 9 A. M.—Deputy Directors Conference.

" 1 P. M.—Cricket Match.

" 9 P. M.—Entertainment (Admission by tickets.)

FRIDAY.

JULY 13TH 8 A. M.—Business Meeting of the Union.
" AFTERNOON.—Deputy Directors, Conference.

SATURDAY.

JULY 14TH—Committee Meetings etc.
Visitors leave.

(viii)

Amendments to the Rules of the Union.

Members under old rules whose arrears to the Union exceed a sum equivalent to their two years' rate of subscription for the journal will not be eligible either to vote or to serve on any of the Committees.—M. Rajagopalan.

In rule 3 after the word "journal" insert the word 'quarterly.'—C. S. Krishnasami.

The title of the journal instead of as at present shall be "the Madras Agricultural Journal"—Organ of the Madras Agricultural Students' Union.—V. Muthusami Aiyer.

There shall be an editorial board of not less than five members ordinarily to represent one section each of whom two namely the Editor and one member shall be members of the working committee; the Vice-President shall be the ex-officio member of the board.—V. Muthusami Aiyer.

Donation for a patron shall be Rs. 250 instead of Rs. 100 as at present.—V. Muthusami Aiyer.

