

THE JOURNAL
OF
**The Madras Agricultural Students'
Union.**

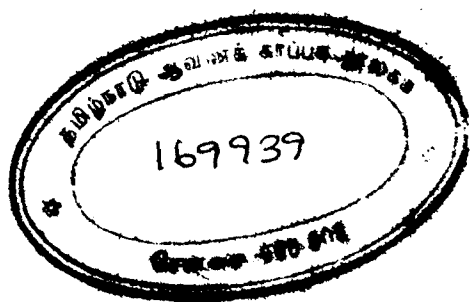
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No.

A South Kanara Wet Land Holding.

M. S. RANGANATHA RAO.

Attavar Kanthappa, a Bhilava by caste, owns 13½ acres in Kankanady village, 2½ miles from Mangalore in South Kanara District. Of these, 6½ acres are double crop wet lands and 7 acres, single crop wet lands. The former are all low-lying fields abundantly supplied with water, the rainfall being supplemented by water from channels. In these wet lands two rice crops known as Yenelu and Suggi are raised followed by a pulse crop of horsegram. The wet lands slightly slope to the South and are surrounded by hills on the North-East. It is on these slopes the single crop lands are situated on terraces and are known as *Bellu*. On these lands one crop of rice is cultivated during the South West Monsoon.

The soil is derived from laterite and it is a clayey loam. Moreover these lands are rich in humus. The single crop wet lands are somewhat red in colour and are heavily manured.

The methods of treating the double crop and the single crop wet lands differ a good deal. Soon after the break of the South West Monsoon the wet lands are ploughed thrice before raising the nursery and thrice before transplanting. Just before the final ploughing ashes and farm yard manures are used. Dancha has been tried in

one or two fields and the owner has found the value of it, owing to the increased yield. Daincha seeds are sown broadcast about the month of February after the harvest of second crop. With the help of moisture in soil, the Daincha seeds sprout well. Just about the break of monsoon the plants are pulled and carried to the loose box cattle shed where they are put to rot. A portion of the crop is also ploughed into the soil in the green state.

The single crop wet lands are also treated in the same manner as double crop fields at the early break of monsoon except in the matter of ploughing. One who cultivates the single crop wet lands first during the early part of the monsoon, before putting his hands into double crop wet lands, is a most successful farmer. The lands are well ploughed twice, after which fish manure is applied. At the time of transplanting ashes are applied to the field and levelling done.

In coconut gardens the ground round the foot of trees is dug to a small depth and the pit is filled with fresh leaves and then covered. Salt is of much value as a manure for these, as also fish manure.

The house of Kanthappa is well and nicely built, being intended for the reception of friends and relatives, and all articles of furniture are decent and well arranged. The verandah is neatly kept and on the right side of it there is a room. As you enter there is a spacious hall where a cot, a bureau and other pieces of furniture are arranged neatly. To the right of the hall, there is an entrance for a small room which is used as a women's compartment. This farm house is sufficient for a small family like that of the owner of the farm, who has a brother as well as two female members. In front of the cottage there is an extensive court yard where straw is stored and at harvest time this court yard is used for thrashing paddy also. To the left of the cottage there is a shed for the cattle where the droppings are collected in the pit.

The garden round the new house, is a small one about one quarter of an acre in extent and contains coconut, Jack, mango and pomelo trees. The front portion of the house has a spacious court yard and to the right side there is a building used for storing.

The chief crops are rice, sugarcane, green-gram, horse-gram and black-gram. The rice crop is raised in rich low-lying lands, or *bailu* and in high lying lands or *bettu*. The farmer commences work with ploughing *bettu* lands in the beginning of June. He devotes undivided attention to his rice fields, the produce of which forms by far the greatest portion of his annual income. When the fields have

been properly ploughed they are manured and a final ploughing, given to cover the manure.

Preparation of the nursery. The agricultural year begins in April and the first work is to prepare the nursery. A fortnight before the harvest of the second crop a pulse crop is sown broadcast among the ripe paddy crop and is removed about April. The farmer then lays the field open to the powerful rays of the sun. At the same time, he sows seed in one of his fields in order to prepare a nursery to serve, if possible, for planting the whole of his farm; 84 lb. of seed sown broadcast is enough to transplant two acres of land. The seed remains in the ground almost unchanged awaiting the arrival of the "Mango showers". This is called "Hudi Neji" or dry nursery. As it is usually not always possible to arrange for a dry nursery, he sows the seed also at the beginning of the monsoon and makes what is called "Nir Neji" or wet nursery. In the experience of the ryot a nursery prepared with the help of tank water before the monsoon is the best and most remunerative. And in the absence of such water facilities, the dry nursery is the next best and is almost as good. The hot weather wet nursery is sown in May. Thirty days after the appearance of seedlings above ground the crop is about a foot in height and fit for transplanting. During these thirty days, the rice fields other than those set aside for the preparation of nurseries are ploughed, manured and got ready for the reception of the seedlings removed for transplanting.

Transplantation. Single seedling transplantation is not followed for two reasons. Firstly the women doing the transplanting usually plant in bunches in order to rush through the work. Secondly the farmer is afraid that in single transplantation there is a probability that the seedling may die, should it be attacked by the "silver shoot" disease.

After-cultivation and harvesting. The first paddy crop both on *bailu* and *bettu* lands being rain-fed, there is no system of irrigating the field. Weeding is quite unknown. Two months later about the middle of September, the crop comes fully into ear and a month later is ready for harvest. All this time the fields are under water which is drained a fortnight before harvest. Care however is taken to drain off the water for a space of three or four days immediately after the seedlings are transplanted.

Second crop preparatory cultivation. As soon as the first crop is harvested, that is, about the middle of October, the fields are again ploughed for the second crop in wet land and fifteen days are allowed for the previous rice stalks to decay thoroughly.

Preparation of the seed for broadcast sowing. Before sowing the bundle of seed is immersed in water about a foot deep and weighted down by placing stones over it; after twelve hours it is removed and the following day the seed is well mixed with thick cow-dung water and heaped and weighted down. The third day the seed is sown broadcast on the fields containing perhaps half an inch of water. After the fourth day water is let in. If any rain falls during this time it is injurious to the rice crop. If a nursery has been made, the seedlings are transplanted after the lapse of four weeks from the time of sowing. This crop is irrigated by water channels that run across the fields. After the harvest, about the month of January a pulse crop like horse-gram or black-gram is raised.

Sugarcane cultivation. The next important crop is sugarcane which is planted in Majalu lands where only one crop of paddy is raised.

Preparatory cultivation. In December after the harvest of the previous crop, the land is ploughed twice and levelled. Trenches $1\frac{1}{2}$ feet deep and $1\frac{1}{2}$ feet wide are made. The distance from the middle of one trench to that of another is about 3 feet. In the trenches compost of fish manure and ashes is applied. Before placing the mixture in the trenches the compost is allowed to rot well.

Preparation of sets for planting. The next thing is the preparation of sets which is done in one of two ways. The first way is the following: The setts soaked well in water are placed on a raised platform by spreading straw on them. After twelve days or so the setts germinate with three or four eye-buds. The setts may also be planted directly without being soaked in water. The ryot has found the latter way better, as the setts germinate earlier with stout tillers.

Planting and first manuring. The setts which are ready for planting are placed in the trenches leaving four inches space between each set and the field is irrigated immediately. For a month after planting watering is done every alternate day.

Interculture and manuring:—In March again fish manure compost is applied on both sides of the row of canes and covered with earth and watered. A third dressing of manure is applied at the beginning of the monsoon and the crop earthed up and watered as before. By the time the rains set in, the manuring is completed and the trenches are filled up. Subsequently earth is taken from between the rows of canes and put at the root of canes gradually as they grow. Deep drainage is made as water is never allowed to stagnate in the trenches. As the

canes grow the dried leaves are removed and tall growing canes propped up. If the loose leaves are not removed, the ryot told me, the buds do not sprout well and thus spoil the canes. Moreover small black ants bore holes in the cane at the node and eat into the soft portion and thus hasten easy lodging of the canes.

Harvesting the produce. The crop is harvested in December and crushed with an iron mill worked by bullock power. The produce of jaggery this year has been estimated at 140 maunds. Five varieties of canes were planted, Red Mauritius, B. 208.147.3412, 6450 and Fiji B, this year at the advice of the Agr. Inspector, Mangalore.

To a certain extent, rotation of crops is done in both double and single crops wet lands by raising pulses like horse-gram and black-gram in the former after the second crop and in the latter with the first crop. Last year Cambodia cotton after the first crop on *bettu* was tried with good success, but was given up as there is no demand for such crop locally.

His cattle consist of three pairs of buffaloes, one breeding bull of Kathiawar breed and a pair of cows of Kathiawar and Nellore breeds. The breeding bull which was passed by the Agricultural Department is a nice and short one, 5 years old in age and I learn that for every serving 8 as. are charged. The buffaloes are big and strong. One pair can work whole day with an interval of three hours of rest. The prices of buffaloes are Rs. 150 and Rs. 100 and Rs. 60 respectively. Early morning all the working cattle are fed with dried stalks of gram and rice washings and straw. In the afternoons after half a day's work, horse gram well ground with beaten rice mash is given and again dried stalks of gram. In the rainy season, for grazing purposes, grass lands are taken on lease for a period of two or three months on payment of a nominal sum of rupees twenty five. The cost of upkeep of working cattle during the agricultural operations, becomes very high - 3 pairs of working buffaloes costing:—

Straw	Rs. 1 12 0
Horse gram	0 12 0
Beaten rice mash	0 4 0
Dried stalks of gram	1 8 0
2 Kudthas of oil	0 4 0
Total upkeep	4 8 0

i. e., on an average Rs. $1\frac{1}{2}$ per pair of buffaloes per day. On other days when there is no field work the cost of upkeep is less.

He keeps the following implements and tools: Ten Ploughs country made and very light, with shares six to nine inches long, generally made of iron. To make all the accessories the holder has to pay the makers in kind; ploughs cost Rs. 15. They are made of Mango, Banyan, or Nux Vomica wood.

He has 5 yokes made of jack. They are light as the cattle are weak and low in height. They cost rupees ten and the wood is of "Honne."

Levelling board, flat wooden board used to level the field before transplanting. It is made of mango plank. The cost of two levelling boards is two rupees.

Three wooden mallets used in bundling rice into muras of 84 lbs cost annas twelve.

5 Mamoties with a long handle and the blade in the form of a trapezium. The cost of blade itself is rupees six.

Pickaxes three, cost rupees ten.

Kodali or axe used for chopping of trees two, cost rupees two.

Wooden thrashing frames used for thrashing paddy. It is in the shape of a window with wooden bars for thrashing paddy the frame is placed on a four legged cot. There are two which cost rupees ten.

Riddles for sifting the paddy, ten, cost rupees two and half. They are made of inferior rattan.

Baskets of moderate size to carry soaked paddy and manures, twenty about rupees five.

Mortars for beating rice made of wood with iron pegs at the bottom to fix them on the ground, cost rupees fourteen.

Cultivation is carried on by permanent and casual labourers. There are two hereditary servants who are "Salada Holeyas" and who are bound to their master by a debt. These "Salada Holeyas" are given one meal during heavy agricultural operations. But permanent labourers all the days in the year are given food thrice a day and they

are bound to do any work all the year round. In the case of "Salada Holeyas" their wages are subject to deduction for the advances made on marriage and other ceremonies. For gathering the harvest and storing it up, hired labourers are employed and are paid at the rate of two seers per head per day. There are five permanent labourers including the Salada Holeyas. To the labourers cash payments are unknown except occasionally. In the case of permanent labourers there is nominal annual payment of rupees twelve to be set off against interest on the debt. On festival occasions presents of rice and other eatables are also made. The permanent labourers are given free lodgings, on the farm.

Generally farmers of South Kanara do not keep accounts. An approximate account is given below of an acre of double crop wet land.

1st ploughing 5 men	...	Rs.	1	2	4
2nd ploughing 5 men	...	"	1	2	4
3rd do.	...	"	1	2	4
Cost of ashes 1 cart-load	...	"	5	0	0
100 head-loads of F. Y. M.	...	"	15	0	0
Seed 40 seers	...	"	7	8	0
Transplanting 20 women	...	"	8	9	0
Harvesting	...	"	6	0	0
Sieving	...	"	0	7	4
Labour for converting paddy into rice	...	"	11	0	0
Labour for converting into muras of 84 lbs. each	...	"	1	6	0
Total expenses for an acre produce of rice 12 months	...	"	58	5	4
Income by the sale of 12 muras of rice	...	"	120	0	0
Net income from an acre	...	"	61	10	8

As regards the other crops like sugar cane and pulses the farmer would give no accounts.

Current prices of staple foods in the place:—

1. New Maskathi 1 muda of 84 lb.	...	Rs.	9	8	0
2. New Maskathi in heap	...	"	8	4	0
3. Guddu Belthiga	...	"	11	6	0

4. Horse-gram 1 bag	...	...	14	0	0
5. Black-gram 1 muda	...	...	9	4	0
6. Green-gram 1 muda	...	...	7	8	0
7. Local jaggery 1 candy	...	...	105	0	0
8. Salt one bag	...	...	5	4	0
9. Dhall 1 bag	...	...	33	0	0
10. Chillies 1 maund	...	...	9	0	0
11. Gingelly oil 1 maund	...	...	12	8	0
12. Coconut poonacs 1 candy	...	...	37	8	0
13. Gingelly poonacs	...	...	52	8	0
14. Mauritius sugar 1 maund	...	...	12	8	0

For the holder, five families are working and they are putting up on the farm itself in cottages. Three families are permanently engaged and are fed by the owner.

The owner has a younger brother and they are the only two male members in the family. Their father, who is now dead was reputed to be one of the best practical agriculturists in South Kanara and his sons are now looking after the lands with similar diligence, since their livelihood is dependent on their holdings.

[N. B.—Figures of costs etc. relate to the year 1920]

Doing Without.

The lesson of doing without is a most important one to learn early in life. We can do without all luxuries and many so-called necessities, if we must. The man who never learns it is apt to be a spendthrift and a wastrel. To become a scholar one must do without idle leisure. To make a fortune he must make the same sacrifice. To be an eminent, useful Christian, one must do without some time and ease and some doubtful amusements.

The great lesson of life, after all, is learning to do without some lower things for higher, learning not to make the good the enemy of the best. Yet it is a comfort to remember that the very best things we never have to get along without. There is plenty of air for all. We never have to give up our share. In most lands water is abundant, and we need not stint ourselves in its use. Love is free for who are loving. A man can have all the friends he wants if he will "show himself friendly."

REV. FRANCIS E. CLARK, D.D.

(From Great Thoughts.)

EXTRACTS.

Where Farming Pays and Why? *

We do not know who Mr. W. Meakin may be, but what he says in this pamphlet is that *farming pays in Denmark* and the reason why it pays there is three-fold:—The Danish farmer is educated as a farmer; he has a land tenure system which gives security to the occupier, so that he is encouraged to do his best; and last, and we should say from the burden of what is written in the pamphlet, he believes in co-operative methods and practises them. Mr. Meakin admits that some maintain that co-operation in itself would have done little for Danish farmers had not 80 per cent. of them been occupying owners and not tenants. What is certain is that, could the land of England be cultivated in the intensive fashion which prevails in Denmark, the agricultural population of England would be increased by nearly 50 per cent.

Denmark is a country of small holders. Its total population is about 3,500,000—less than the population of Scotland. In the country there are 189,600 farms. Of these only 400 exceed 600 acres; 1000 are from 300 acres to 600 in area; 4,000 are from 150 to 300 acres; and 22,500 are from 75 to 150 acres. By far the largest number are from 12 to 25 acres, and from 36 to 75 acres. Of the former there are 42,000 and of the latter 43,300. Between these there are 25,400 the extent of which is from 25 to 36 acres. Of what might be called allotments rather than farms there are 27,700 varying in extent from 4 to 8 acres, and 23,300 whose area varies from 8 to 12 acres. It is said that there are very few persons employed on the land by others who do not themselves occupy one of the smaller-sized holdings.

The argument of the pamphlet is that were British farmers to adopt the co-operative methods of Denmark they could make British agriculture flourish. It may be so, but let us not forget that nearly 40 per cent. of the population of Denmark are supported directly by agriculture. The landholding class in Denmark can dictate the national policy. The secret of the success of the co-operative methods in Denmark is that the Danish farmer has to find his principal market outside of his own country; he is an exporter, and his experience as such has taught him that he can be most successful

* "Where Farming Pays and Why?" by W. Meakin. With a foreword by C. S. Orwin, M. A. Published by Iliffe and Sons (Ltd.) Tudor Street, London, E. C. 4. Price One shilling.

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in that line when he studies his customers. He caters for his customers, and he has found by experience that he can only command markets when he can put upon them standardised products. It is a mistake to suppose that co-operative methods have been superimposed upon the Danish farmer, he adopted co-operative methods because he found that unless he did things on the big scale, with uniformity in quality, he could not command a market for his goods. The Danish farmer, Mr. Meakin tells us, has applied the co-operative principle to every activity—to production, distribution, purchasing, stock improvement, insurance, finance, and banking. The State did not pass Acts of Parliament making it easy for the small farmers of Denmark to co-operate; the small farmers of Denmark themselves began to produce and distribute on co-operative lines, and "the help of the State is limited to generous aid for education and research, grants to stock-breeding societies, and the use of the State railways for service rather than for profit."

Mr. Meakin describes in successive chapters how one finds a prosperous farming community in Denmark in spite of the fact that the cost of living there in 1923 was 104 per cent. above pre-war standard. The people are heavily taxed, yet they are able to bear their burdens without losing their cheerfulness. Wages of agricultural workers are from 30s to 35s per week, but there are comparatively few whole-time agricultural workers. There are relatively few very rich people in the country; wealth, like education, is widely diffused. In spite of post-war conditions and trade depression one-fifth of the total State income is spent on schools, universities, agricultural education, and research, and grants to agricultural institutions other than those of an educational character. This expenditure on the part of the State is in addition to expenditure by local authorities on education. In Great Britain every penny spent on education is grudging, and about eight times the amount is spent on alcoholic liquor that is spent on education. We can learn a good deal from Denmark.

Extracted from *THE SCOTTISH FARMER*.

Dated 2nd February 1924.

Some Hints on Milking.

R. T. McKenzie, Senior Dairy Supervisor.

In the operation of milking, relations between the cow and the milker must be harmonious if the best results are to be obtained.

The nervous system of the dairy cow is very closely related to her mammary system, and just as the secretion and extraction of milk are closely allied, the nervous and mammary systems are inseparable. It is generally conceded that a considerable amount of milk that a cow gives is actually secreted during the process of milking, and that being so, the greatest quantity of milk the cow is capable of giving cannot be obtained if she is annoyed or irritated; or if the udder is hurt by faulty manipulation on the part of the milker. By careless and improper methods of milking the lactation period may be seriously shortened, the animal drying off long before her normal period. The aim of the milker, therefore, should be to extract the greatest volume of milk without irritating the cow or doing injury to the udder. The rough treatment often meted out to the cow, such as scolding, kicking, or striking her if she is a little obstreperous when being put into the pail, generally affects the flow of milk and the amount of butter-fat it contains. Pure-bred animals are more susceptible in this respect than grade cows, as their nervous system is more highly developed. It must also be borne in mind that temper, like the milking faculty, is hereditary, and the aim should be, by considerate treatment, to have contentment and a gentle disposition developed in the herd.

The operation of milking should be performed quietly, quickly and deftly, with the full hand, not merely the finger and thumb. Any rough manipulation of the udder will interfere with the work of the lacteal glands. Clean stripping is very necessary, for it is generally known that the last milk drawn from the udder is much richer in fat than the first, and apart from this there is the danger of curtailing the lactation period, for the cow soon becomes accustomed to such treatment, decreasing the flow until it ultimately ceases. At the same time the process of stripping should not be too prolonged in case the animal should develop a tendency to "Strippiness," a thing all milkers detest.

As the cow is a creature of habit and routine, it is advisable for the same milker to milk the same lot of cows on each occasion. It has been proved by experience that the usual milker will get the milk more readily than a strange one, no matter how skilful the stranger may be. In the case of machine-milked cows, they are not milked right out, and it is necessary for a "stripper" to follow the machines. It is largely through this break in the continuity of milking, that machine-milked cows dry off a little earlier than hand-milked ones. The interval between morning and evening milking should be as even as possible. The evening's milk is usually richer in fat than the morning's. The greater the interval, the greater the

variation in the test. The importance of well-regulated milking hours is therefore obvious. At the same time it should be stated that many experiments have demonstrated that there is a natural variation between the night and morning milk. Even when the intervals between milkings are even, the evening milk is generally richer in fat. The reason for this difference is somewhat obscure. It is thought by some that the more active metabolism in the animal body during the day may cause this variation, or that the increase of fat in the evening's milk is a provision of nature to supply the calf with more energy during the night, when it is required more than during the day.

Many discussions have taken place over the question of wet *versus* dry milking. Wet milking has been condemned because of the neglect of some milkers to take ordinary precautions against contamination. As under this method the teat is usually moistened by dipping the fingers into the pail of milk, it is easy to understand the contamination that follows. This dirty practice cannot be too vigorously condemned. With dry milking, unless the udder is previously washed, dust and scales are liable to fall into the milk and cause as much damage as would take place with wet milking. If the udder is washed prior to milking and the hands of the milker also, the teats will be sufficiently moistened without the need of resorting to the dirty practices before mentioned. To summarize:—

1. Don't frighten or ill-treat the cow about to be milked, or her nervous system will be upset. This will mean less and inferior quality milk.
2. The milking should be done quietly, quickly and deftly with as much full hand milking as possible.
3. Strip thoroughly or else the lactation period will be shortened. The strippings are the richest part of the milk.
4. As far as possible, the same milker ought to milk the same cows at each milking.
5. Arrange that the interval between milking be as even as possible to avoid any great variation in fat content (this is more important in the case of milk vendors).
6. Avoid wet milking; it is a dirty method, and will adversely affect the grade of cream.

Journal of Agriculture, Victoria. Jan. 1924.

REVIEWS.

During the month we have been favoured with four of the publications of the Madras Agricultural Department.—(1) the Administration Report of the department for 1922-23, (2) the Year Book for 1923, (3) Bulletin Nos. 86 and 87. The outstanding features in the administration report are references to (1) the submission of proposals for doing away with the present certificate course at the College and its replacement by "vernacular courses in practical agriculture to be given in selected agricultural tracts or districts" and starting a special Intermediate Course for agriculture qualifying those who pass it for the B. Sc., Ag., Degree examination, (2) the success of Coimbatore 205 variety of sugarcane in the unirrigated areas of the Punjab, (3) the evolving of two new paddy strains by the Government Economic Botanist which give an average increase of 7 per cent, (4) the completion of the soil survey of the Periyar tract, (5) the commencement of the survey of the Ongole Breeding-tract, (6) the closing down of Anamalai and Gudiyatham farms.

The Year Book contains several useful articles of scientific and popular interest. Those that may be singled out for mention are "Short lessons to a cultivator" "Making of artificial farm-yard manure", "Feeding experiments on cows." "Casuarina root nodules and nitrogen fixation." Bulletin No. 86 is a reprint of a former bulletin on "the Ground, - Earth - or Pea-nut" written up to date. Bulletin No. 87 "List of important insects injurious to cultivable crops in South India" by Mr. T. V. Ramakrishna Ayyar is issued as a companion to his previous bulletin on "the Entomologist's crop pest calendar for the Madras Presidency.

V. M. A.

The Madras Villagers' Calendar 1924-25 ... Price 1 Anna.

This publication of the local agricultural department has maintained its high level of excellence. The present issue contains several useful articles, in which the ryots are directly interested in this day to day life. Points on co-operation. Cattle diseases, insect pests and diseases on important crops like cholam and tobacco, ginger, arecanuts, paddy and coconut, useful hints on manures and manuring, cultivation of pine-apple and kolakkattai grass, use of fish-meal as food for Live-stock are subjects, most of which certainly do not suffer by repetition. We hope the low price, the very popular way in which the articles are written, and the variety in the choice of the subjects all add to the popularity of the Calendar and enhance its usefulness in spreading the knowledge of neo-agriculture amongst the ryot population.

showed them all to be dead within six days. In some cases, where the growth of the plant in the laboratory was defective and the stems remained almost colourless, the larvae were able to develop into adults, although very slowly, but with normal development the larvicidal properties were obvious. Another species not yet determined, but probably *C. intermedia*, killed all larvae within 48 hours after their introduction into the water in which it was growing, and is obviously a powerful larvicide. Several pieces of water in the regions of Castellon and Barcelona, in which in 1920 mosquito larvae were present but no *Chara*, were found on re-examination in the following year to contain a certain amount of *Chara*, while all mosquito larvae had disappeared.

A. Caballero :— Bol. R. Soc. Espan. Hist. Nat. XXII No. 9 pp 418—421—Madrid—Nov. 1922.

Aims and Organisation of Plant Pathological Service in Canada.

In view of the great diversities in climatic and other conditions affecting plant life in a great stretch of country like Canada, the problems confronting the growers of crops are very varied. In order to maintain the closest touch with the actual cultivators throughout the Dominion, a chain of plant pathological laboratories has been established throughout the length and breadth of the land, where pathological problems confronting the different regions can be better studied than in a central laboratory. This also enables the department to maintain a very close plant disease survey and to secure accurate information regarding the prevalence of diseases.

Research work conducted in the branch laboratories regarding *Puccinia graminis* (black stem rust of wheat) has revealed the existence of a considerable number of biologic strains of the fungus and attempts are being made to breed rust proof varieties of commercial value. Diseases of potatoes—particularly mosaic and leaf-roll—control of scab of apples and European apple tree canker and physiological effects resulting from irrigation of orchards are also dealt with in some of the laboratories. Besides directing the work of these branch laboratories, researches on the diseases of forest trees, tobacco diseases, bacterial diseases and special lines of investigation in plant pathology and physiology such as the relation of temperature and light to plant life are undertaken at head-quarters. There is also a dominion-wide system of field and tuber inspection of potatoes for seed purposes made according to a high standard of freedom from diseases. This has been going on for the last 8 years. 11,250 acres of potatoes were examined in 1922 and the country now possesses a large amount of seed potatoes particularly free from disease.

Int. Rev. Sc. and Prac. of Agriculture New Series Vol 1 No. 3
July-Sep 1923. S. R. V.

ESTATE NEWS.

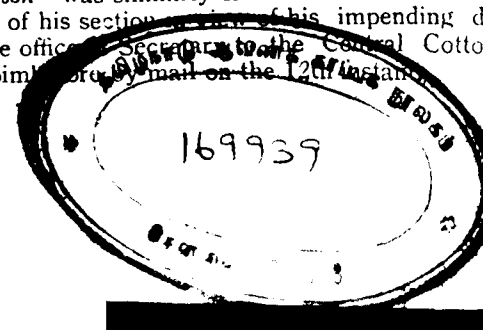
Visitors. M.R.Ry. Venkataranga Rao Bahadur, Zamindar of Mungala, paid a visit to the estate on the 10th inst. and made a stay of 2 days. He went round the various laboratories and visited the Central Farm and the Dairy. It is a pleasure to note an enlightened landlord of his type taking such active interest in agriculture as to propose to send his son to undergo the B. Sc. course in agriculture. We understand his son had indeed preceded him and stayed a few days among the students in order to get an idea of the actual conditions of the course.

The Officers' Club. There was a social gathering at the club on the 11th inst. to bid goodbye to Mr. H. Balaraj, P. W. D. Supervisor in charge of the construction of new quarters, who went on transfer to Tirupattur on promotion.

Gana Sabha. There was a musical entertainment at the Officers' Club on the 9th inst. at 4 p. m. under the auspices of the Agr. College Gana Sabha, when Brahmasri Sembai Vaidyanatha Aiyar gave a fine performance in Vocal music to a fairly large audience. His very pleasing and melodious voice added to the scientific knowledge of music displayed by him gave general satisfaction to all.

Send-off to Mr. Parnell. On the 8th instant, the members of the Estate organised a Tea party in the College Quadrangle to bid goodbye to Mr. and Mrs. Parnell who were on the eve of departure for England. There was a large gathering on the occasion including Europeans and Indians. Rao Sahib M. R. Ramaswami Sivan gave expression to the general feeling of regret of the colony as to the impending departure of Mr. and Mrs. Parnell from their midst probably for good, and referred to the various good and amiable qualities evinced by Mr. Parnell in his capacity as Principal and as Economic Botanist. Mr. Parnell replied suitably thanking the members of the Estate for the expressions of good-will and kindly feelings demonstrated by them. The function came to a happy close with a call for cheers to the principal guests of the evening. Mr. Parnell was similarly the recipient of farewell entertainments from the section of Economic Botany and from the Students. He left Coimbatore by mail on the 10th instant.

Mr. G. R. Hilson was similarly entertained at Tea on the 7th instant by members of his section on the occasion of his impending departure to take charge of the office of Secretary to the Central Cotton Committee. He left Coimbatore by mail on the 12th instant.



Mr. F. T. T. Newland who is on the eve of retirement from service as Govt. Agrl. Engineer was entertained by members of the Estate in the College Quadrangle on the 22nd instant at 5-30 p. m. There was a fairly large gathering on the occasion. Mr. C. Tadulinga Mudaliar in a short speech gave expression to the general feeling of gratefulness of the Estate to Mr. Newland in various matters—and particularly in reference to the completion of the new water-supply scheme—which in his opinion ought to be known as the "Newland" scheme and to which he should attribute the comparative safety of the Colony during the recent cholera outbreak. The party terminated with a call for cheers to the guest of the evening which was lustily responded to.

Mr. Muhammad Afzal B. Sc. Punjaub came here for training in cotton work under the Cotton Specialist at Coimbatore and left at the close of the month.

The Health of the Colony. The Estate received a very rude shock at the beginning of the month by the occurrence of two cases of "Cholera" of a virulent type, which resulted in the loss of two persons both members of the family of Employees on the Estate. It is believed that the dire disease was imported from the Karamadai Car Festival which took place recently. It is a matter for congratulation to note that there were no further cases of attack on the Estate.

DEPARTMENTAL NEWS.

Mr. R. C. Broadfoot took charge of the office of Cotton Specialist on the 7th instant from Mr. G. R. Hilson on temporary transfer to Bombay as Secretary, Indian Central Cotton Committee.

Mr. F. R. Parnell handed over charge of the Principalship to Mr. R. C. Broadfoot under orders from the Government on the 10th instant; and of the office of Government Economic Botanist to Mr. K. Ramiah Asst. Ec. Botanist, Aduturai Paddy Breeding Station. He left for England on long leave preparatory to retirement on proportionate pension by the night mail of the same date.

In this connection the following Extract from "Nature" of Feb 16, 1924 would be interesting.

"At a recent meeting of the executive committee of the Empire Cotton Growing Corporation, Mr. F. R. Parnell, Economic Botanist

to the Government of Madras was appointed to a post as plant breeder under the Corporation. He will proceed to South Africa shortly to work under Mr. S. Milligan, who has resigned his post as Agricultural Adviser to the Government of India to take up an appointment with the Corporation, to advise the Government of the Union of South Africa on all matters connected with cotton growing."

Mr. K. Gopalakrishna Raju L. Ag. left Coimbatore on the 9th instant on transfer to the VI circle as Asst. Director of Agriculture. Mr. C. V. Seshachari L. Ag. has taken charge of the duties of Asst. Superintendent' Central Farm. in his place.

Mr. F. T. T. Newland, Govt. Agricultural Engineer is to retire from service from about the end of the month. Mr. Dunhill of the Industries Department has been posted as Assistant Agricultural Engineer in his place.

We understand that Dr. R. V. Norris returns to India to take the place of Dr. Fowler—the Biochemist at the Tata Research Institute, Bangalore, on the retirement of the latter at the end of his agreement.

We learn from a recent Government Order that the Agricultural Middle schools at Taliparamba and Anakapalle—which had been more or less under a dual control from their inception—are to be handed over to the management of the Agricultural Department from the Educational with effect from 1st April 1924. It is a step which, we believe, will conduce to a better working of the schools.

UNION ACTIVITIES.

The walls of the Union Building have now risen to the height of the roof and steps are being taken to put up the roofing. As the Working Committee is keenly feeling the want of funds, it begs to request that such of the members as have subscribed would kindly remit their donations to the Treasurer as early as possible. Those that have not yet subscribed are requested to be so good as to send their mite at once to help the Union.

Secretary.

STUDENTS' CORNER.

Games:—During this month, owing to the general rise in the temperature and the approach of the examinations, there was but little activity. The Inter-class matches were, however, played in Hockey, and the students of class II, Certificate Course, came out successful and secured the "Victory Cup."

Award of Colours:—Messrs. M. C. Cherian and A. R. Krishnamurthi were awarded colours in Football, and B. N. Pattathan in Hockey.

Tours:—Students of B. Sc. III went on a short tour to Nellikuppam and returned.

Lectures:—The following special lectures were delivered to the students during the month (1) Mr. K. Krishnamurthi Rao—on "The Chemistry of Sugar-boiling". (2) Mr. K. S. Viswanatha Aiyar—on "Bacteriology." (3) Mr. B. Viswanath—on "Enzymes." (4) Rao Sahib M. R. Ramaswami Sivan—on "Phosphatic Nodules"—on which occasion Mr. C. V. Venkataramana Aiyangar, B. A., B. L., M. L. C., presided.

Examinations:—Examinations in Part I, B. Sc. Ag. degree commenced on the 24th inst. and lasted till the 27th inst. and Part II—B. Sc. Ag., degree commenced on the 28th inst. The Practicals both for B. Sc. Part I and Part II will be taken up in April.

Theory question papers for B. Sc. Ag. Part I are included in this number of the Journal, for the convenience of the students.

UNIVERSITY OF MADRAS.

B. Sc. Ag. Degree Examination, 1924.

PART I

ENGINEERING

MONDAY, 24TH MARCH. 7-10 A.M.

[Only SIX questions are to be answered, not more than THREE from either part. All candidates must attempt Question 1.]

A.

1. (a) Name the several parts of a monsoon plough, and the material of which they are made.

(b) How does a ploughshare maintain its sharpness?

(c) What is the best direction for the line of draught in a swing plough? Why?

(d) Explain how the size of a wheel of a cart affects its draught.

2. Describe with sketches, one of the following:—

(a) The arrangement in a double-roller cotton gin for causing the knives and grid to oscillate.

(b) The arrangement in a reaper for giving the to-and-fro motion to the cutting knife.

(c) A bullock gear for driving machines.

3. (a) Explain clearly the principle underlying the construction of a mhote.

(b) Find the efficiency of a mhote from the following data:—

Slope of ramp, 1 in 5.

Weight of bullocks, 1,348 lb.

Weight of rope and bucket, 48 lb.

Height of lift, 25 feet.

Extra height necessary for discharging bucket, 2 feet.

Water lifted per trip, 24.2 gallons.

Draught exerted by bullocks coming down slope, 383 lb.

4. A teak-wood doubletree has to be made to stand a safe draught of 840 lb. The distance between the traces is 4 ft. Find the breadth and depth of the doubletree assuming that it is rectangular in section. The constant for teak-wood is 730 and the factor of safety is 7.

B

5. A string 15 ft. long is suspended between two nails driven into a horizontal ceiling 10 ft. apart, and a load of 10 lb. is attached to the centre of the string. What is the magnitude of the force acting on each nail?

6. The sides of a quadrilateral field are measured with a Gunter's chain, and are found to be as follows:—AB 10 chains, BC 12 chains, CD 15 chains, and DA 17.7 chains. If the internal angles at A and C are 77° and $84^\circ 22'$ respectively, what is the area of the field in acres?

Suppose there was no instrument available by which the angles could be measured, and instead the diagonal AC was measured and was found to be 19.57 chains long. Work out the area again using this data.

7. On a farm there is a three-inch pipe line, 5,300 feet long, to supply water to the house. The head of water above the point of discharge is 10 feet. The owner wants 1,000 gallons per hour, but it is found that this quantity of water does not flow through the pipe. You are called in for an opinion. Write a report, explaining, with proof, why the required quantity of water does not flow through the pipe, and work out the remedy in detail.

8. A 9 h. p. oil engine is supplied by a firm who guarantees the thermal efficiency to be 20 per cent. If the oil that is used has a calorific value of 10,700 centigrade heat units per pound, how many pounds of the fuel would you expect the engine to consume per hour?

ANIMAL HYGIENE.

MONDAY, 24TH MARCH. 1-4 P. M.

[Only FOUR questions are to be answered. All Candidates must attempt Question 1.]

1. (a) Give the names of the several stomachs found in cattle. State which are concerned in the act of rumination and the part each plays.

(b) Describe the process of digestion and assimilation, and state in which part of the alimentary canal they take place.

2. What are the symptoms—both ante-mortem and post-mortem—of anthrax in cattle? How would you dispose of the carcasses of animals dying from this disease? Give your reasons for the precautions taken. What other methods would you adopt to stamp out an outbreak of anthrax in a herd of cattle?

3. Give the actions, use, and dose for cattle of the following drugs:—oil of turpentine; powdered nux vomica; sulphate of copper; sal volatile; common salt; carbolic acid; chirata; treacle; laudanum.

4. What is the normal temperature and number of respirations per minute on a cold day of (a) cattle, (b) sheep?

Describe briefly the physiological act of perspiration, and state how this is carried out in (a) cattle, (b) sheep.

Describe the ordinary signs of fever in a cow, and state what your first lines of treatment would be for such a case.

5. Give your opinion as to the best type of shed to be erected for housing ten pairs of bullocks in a district in the Northern Circars.

Illustrate your answer with a plan, giving detailed measurements.

Discuss the points to be aimed at in selecting a site, and the merits of different kinds of flooring, drainage and ventilation which might be adopted.

CHEMISTRY.

TUESDAY, 25TH MARCH 7-10 A.M.

1. Explain the terms 'empirical, molecular, and constitutional formulae'. Illustrate your answer by applying the same to acetic acid,

2. How do you distinguish between alcohols having the formula $C_4H_{10}O$?

3. Either, What is glycerine, and how is it manufactured? Explain the chemical changes involved in the process.

Or, Explain the chemical changes that take place during the manufacture of alcohol from sugar, and describe the process in detail.

4. Either, Name the most important minerals from which soils are derived, and describe the chemical changes brought about during disintegration, referring at the same time to the agencies that take part in this process.

Or, Discuss the properties of sand, silt, and clay with special reference to absorption and retention of water and plant-foods.

5. What do you know of the changes brought about in the nitrogenous compounds of the soil by bacteria?

6. Either, Describe how you would estimate nitrogen, phosphoric acid, lime and potash in a sample of soil.

Or, State what you know of the formation, composition, and properties of black cotton soils.

ZOOLOGY

TUESDAY, 25TH MARCH. 1-4 P. M.

[Only SIX questions are to be answered. All Candidates must attempt Question 1.]

1. Draw a diagram to show the internal organs revealed in a median longitudinal section of a female grasshopper.

2. Describe, with the help of a diagram, the mouth parts of a house-fly, and explain clearly how it feeds.

3. What is parasitism? What are the conditions which must be satisfied preliminary to the introduction of a parasite into a country for the control of a pest there?

4. Explain by reference to the relevant features in the life-history of the pest and the methods of cultivation of cotton in the locality why the Pink Boll worm had to be brought under the Pest Act.

5. Describe the more important pests of sugar-cane in South India and the methods of controlling them which may be adopted.

6. Describe the life-history of any pest in South India so as to bring out clearly the influence of seasonal and weather conditions on its incidence and virulence.

7. What methods would you adopt to control—(a) the house-fly, (b) the cut-worm, (c) the mango-stone weevil, (d) the mole cricket?

8. Give an account of Lac cultivation in India. Make suggestions as to possible lines of improvement.

BOTANY I.

WEDNESDAY, 26th MARCH 7-10 A. M.

[Only FIVE questions are to be answered. You are expected to give examples and sketches wherever necessary.]

1. Give an account of the chief functions of the foliage leaves of plants, and show, by means of sketches, how the structure is adapted to the functions they have to perform.
2. Describe the modifications usually met with in underground stems, pointing out, if any, the advantages of such modifications to the plants concerned.
3. What are the characteristics of the families Cucurbitaceæ and Amarantaceæ? Mention some plants of economic importance of these families.
4. Describe the different kinds of fleshy fruits, stating in each case the morphological nature of the fleshy part.
5. Give an account of the formation of cambium in the roots of Angiosperms.
6. Explain, giving examples, the terms:—phyllode, micropyle, mitosis, synergids, comose, and dioecious.

BOTANY II.

WEDNESDAY, 26TH MARCH. 1-4 P. M.

[N. B.—Only FIVE questions are to be answered.]

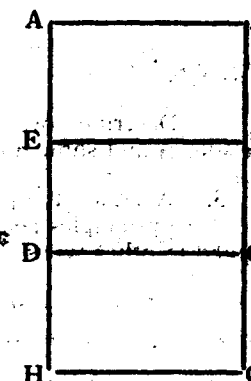
1. Give the life-history of a moss plant and give in detail the structure of its capsule.
2. Give an account of the various methods of reproduction in fungi.
3. How does a Selaginella plant differ from that of a fern?
4. What are the chief differences between rusts and smuts in their life-history?
5. Write a short account of the rust disease of coffee.
6. Name some of the diseases of sugar-cane and give an account of the remedial or preventive measures adopted in each case.

AGRICULTURE. 1.

THURSDAY, 27TH MARCH, 7-10 A. M.

[Only FIVE questions are to be answered. All Candidates must attempt Questions 1 and 2.]

1. ABCD represents the plan of a heap of kankar $10' \times 6' \times 2'$ placed in field No. 10 of the Central Farm and left in position throughout the N. E. monsoon rains. After two months of dry weather, half of the heap of kankar was removed and a pit EFGH of the same dimensions was dug in the position shown.



State what differences, if any, you would note between the side of the pit represented by EF as compared with this side GH. Explain how these differences were brought about.

2. (a) What is a plough? (b) What are the main purposes for which a plough is used? (c) Explain how the effect produced by this implement is of use to the crop grown. (d) What are the adjustments possible on a Sabul plough? Show how alterations in these adjustments affect the action of plough. Illustrate your answer by diagrams.

3. Explain the effect of 'cropping' on 'fertility.'

4. You are asked to issue instructions for manuring a field of cholam. State what factors you would have to take into account. Illustrate your answer by reference to particular cases.

5. A field is roughly 10 chains square and has a uniform slope from E to W. It has to be manured with cattle manure at the rate of 10 tons to the acre and has to be ploughed deeply. The whole work is to be completed in four days. Illustrate by a diagram how you would lay out the field. State what labour you would require and how you would organize it.

6. Why do garden soils tend to become saline? State, giving explanations, (a) how this tendency can be checked, and (b) how salinity can be reduced.

AGRICULTURE II

THURSDAY, 27TH MARCH 1-4 P. M.

[Only six questions are to be answered. All candidates must attempt Questions 1 and 2.]

1. Explain the action of water in its various forms in the disintegration of rocks.
2. Describe how the monsoons affect the different parts of the Presidency and show how the cropping seasons vary accordingly.
3. What are the principles on which dry land farming is based? Are these principles peculiar to this type of farming, or may they be applied to other types of cultivation? If so, how?
4. What is meant by 'rotation of crops'? What are the advantages of a proper rotation?
5. A rich landlord has 100 acres of dry land under scrub jungle in a tract with an average annual rainfall of 40" to 45". What agricultural implements do you suggest for cultivating this area? Write brief notes on the working of each.
6. Ryots generally fold their cattle in their fields for six months in the year and stall them for the remainder of the year. Compare (a) the relative manurial values of the collection from four pairs of working cattle under the two methods, and (b) the area of garden land which can be manured by each method.
7. A ryot owns lands near a perennial stream. The lift is 15'. Compare the relative cost of irrigating an acre of chitrai cholam (requiring six or seven irrigations to mature it) by (a) Picotah, (b) Mhote, (c) centrifugal pump worked by an oil engine.
8. Compare the relative values of:—
 - (a) 4,000 lb. green-leaf (sannhemp), 1 cwt. bone meal.
 - (b) 2,000 lb. green-leaf (wild indigo), 1 cwt. bone meal.
 - (c) 3 cwt. groundnut cake, 1 cwt. bone meal.
 - (d) 5 cwt. castor cake.
 - (e) 3 cwt. fish guano.
 In each case for one acre of paddy.

EDITORIAL NOTES.

Agricultural Conditions 1923-1924.

The year has been characterised by unusual weather conditions. The South West monsoon was late in bursting and proved to be very erratic and ill-distributed. While South Kanara, Coorg and Mysore Malnad received such a great excess of rain that large areas were devastated by floods, the monsoon was in defect to a greater or less degree in other parts of the Province. The Return or North East monsoon was similarly very unsatisfactory. Failure of rains has brought about acute distress in Anantapur and Bellary and in parts of Salem and Coimbatore, a scarcity of fodder has arisen which has resulted in large numbers of young stock being disposed of at ridiculously low prices in the local markets. On the other hand, cyclones and phenomenally heavy rains were received in Ganjam and Vizagapatam and Tinnevely Districts accompanied by floods and damage to houses, trees and fields. Owing to these reasons, the year has proved a most disappointing one. There is distress everywhere and famine is staring in the face of people in the Deccan Districts. South Kanara and Malabar which had an excess of rain in the early part of the year are now suffering from a deficiency of the same in the second crop period. The year has after all justified the Hindu name of "Rudhirdagari" or "Bloodspitter." The continued spell of dry weather—which has been with us since the middle of November at Coimbatore and probably also in most parts of the Presidency has not proved re-assuring. The cultivators have been anxiously looking forward to the receipt of the "Mango showers" which besides brightening the prospects and saving the mango crop from ruin, may also be expected to keep in check various epidemics such as Cholera and Small-pox which usually spread in seasons of drought.

We fervently hope that the Almighty may in His kindness save the poor Indian Cultivator—who is so dependent on a good monsoon for his welfare—from another year of a similar character.

Lord Willingdon and his Successor.

It is given unto few Englishmen of exalted rank to possess such long acquaintance with India as has been the share of His Excellency, Lord Willingdon. His period of tenure as Governor of Bombay for seven long years in the pre-reform days was itself of a very exacting nature. His Excellency came to Madras in 1919 and his advent into

this province synchronised with the introduction of the Reforms. His keen interest in Animal Husbandry and agricultural development in general induced him to take up the agricultural portfolio here before it passed under the Reformed constitution into the hands of the Development Minister in December 1920 and it was perhaps in the best interests of the country that he should have taken up that portfolio, since it gave him a deep insight into the agricultural needs of this presidency. A keen observer of men and affairs, a skilful administrator and a tried politician, it was easy for His Excellency to read aright the signs of the times and play his part in the march of progress this country had set itself to. In 1920 His Excellency made whole-hearted recommendations to the Secretary of State for the promotion of some Indians to the Indian Agricultural Service and later encouraged his colleague, the Development Minister, Sir K. V. Reddi Nayudu in the pursuit of the policy of Indianisation. His Excellency's enthusiasm in agricultural development is too well known to need mention at any great length. His Excellency visited the Agricultural College and the allied Forest and other institutions at Coimbatore in 1920 and in July 1922 laid the foundation stone for a building designed to house the teaching sections of the institute. It is owing to the strenuous efforts of His Excellency that the Local Government could secure a grant of 3½ lakhs of Rupees from the Central Government for the building, which is now nearing completion. Had it not been for his Excellency, the agricultural department in this province would not have expanded during the last five years as rapidly as it has done in the face of threatening financial deficits and the earlier ill-informed criticisms of the members of the Legislative Council in their first outburst of irrepressible zeal to serve their motherland. To quote an instance, the department's expenditure in 1918-19 was only 10'11 lakhs while it had risen in 1922-23, to 14.82. His Excellency is a good breeder and the very fine animals that have been an accompaniment to the Government House during His Excellency's stay in Bombay and Madras are an incontrovertible testimony to His Excellency's interest in Dairying. In this and other diverse matters that have engaged His Excellency's attention, Lord Willingdon has, we are glad to be able to state, been ably, sympathetically and with alacrity, helped by his wise and noble wife, Lady Willingdon. Their Excellencies' departure from Madras on 8th April 1924 will be consequently viewed with regret by all interested in agriculture in this Presidency. We may confidently state that the good wishes of Madras will follow Their Excellencies to their distant home in freedom-loving Britain.

We take this opportunity to extend our hearty welcome to Lord Goschen as the successor of His Excellency Lord Willingdon. We hope that, during his regime, there will be no slackening of the public

interest in the betterment of the Indian world and that Government will not swerve from the path of the development of the country's resources. We understand Lord Goschen is not an amateur in public life. He has been Joint Parliamentary Secretary to the Board of Agriculture and comes out with an open mind on problems which agitate the Indian world.

Travancore Representative at the Empire Exhibition.

We are gratified to learn that the Travancore Durbar have selected Dr. N. Kunjan Pillai to represent them at the British Empire Exhibition at Wembley Park and to supervise the Travancore section of the Indian Exhibits. Dr. Pillai, we need hardly tell our readers, is the permanent Director of Agriculture, Travancore State and is besides responsible for directing the work in the Veterinary, Fisheries Sericultural and Apicultural sections. He is the President of the Economic Development Board and has served on several committees, such as the Vernacular Education Committee, the University Committee and the Kallar Hydro Electric Committee. Graduating in Chemistry with distinction in 1903 in his 21st year of age from the Maharaja's College Trevandrum, he went to Europe where he spent 3 years at Edinburgh, 2 years in Leipzig and returned to his native place with the M.A., B.Sc. and Ph.D. degrees. Soon after his arrival he was appointed to the post of Director of Agriculture, Travancore, which was newly created. He has organized the Department and has been ably administering it during the past 15 years. His ripe experience, insight into the defects in local agricultural practices, and wide knowledge of conditions abroad eminently fit him to be the proper guide and real friend of the Travancore ryot. We hope his organising ability which showed itself in the Preliminary Exhibition of Trevandrum last December, at which His Excellency Lord Willingdon, was present will be much more conspicuous at Wembley. We learn he was given a hearty send-off on 2nd January 1924 on the eve of his departure on deputation to England. We wish him success and we are sure the Durbar will have reason to congratulate themselves on the splendid choice they have made in Dr. Kunjan Pillai—a son of the soil.

Ramasastrulu—Munagala Prize Essay.

We beg to invite the attention of the readers to the notice regarding Ramasastrulu—Munagala Prize essay for 1924, which appears elsewhere in this number and trust there will a large number of entries for the competition.

UNION ADVERTISEMENT.

The Ramasastrin-Munagala Prize 1924.

1. The Prize will be awarded in July this year.
2. The Prize will be in the form of a medal and will be awarded to the member of the Union who submits the best account, of original research or enquiry, carried out by him, on any agricultural subject.
3. The subject-matter shall not exceed in length twelve foolscap pages type-written on one side.
4. Intending competitors should notify the Secretary of the Madras Agricultural Students' Union not later than the 15th May 1924 the subject of the paper which they propose to submit and the paper should be sent in, so as to reach the Secretary, Madras Agricultural Students' Union, not later than the 1st June 1924, with a covering letter showing full name and address of the sender. The author's name should not be shown on the paper which should be entered under a nom-de-plume.
5. Four type written copies of the essays should be sent in.
6. The name of the successful competitor will be announced and the prize awarded at the time of the Conference in July 1924.
7. The Union reserves to itself the right of publishing all or any of the papers.
8. All references in the paper to published books, reports, or papers by other workers must be acknowledged.

Any further particulars may be obtained from the Secretary, Madras Agricultural Students' Union, Lawley Rd., P. O., Coimbatore.

(Sd.) M. U. VELLODI,
General Secretary,
M. A. S. Union.

DEPARTMENTAL NOTES.

Appointments etc.:-

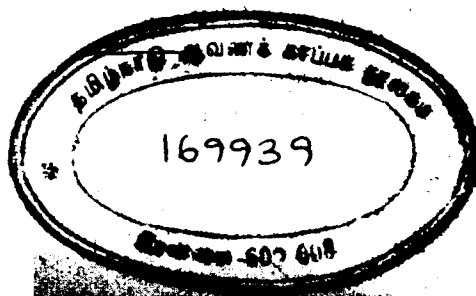
1. Mr. R. C. Broadfoot, Deputy Director of Agriculture, to officiate as Cotton Specialist, vice Mr. G. R. Hilson on other duty.
2. Mr. R. C. Broadfoot, Acting Cotton Specialist, to be Acting Principal, Agricultural College, in addition to his other duties, vice Mr. F. R. Parnell, granted leave.
3. Mr. Saadat-ul-lah Khan, Probationary Deputy Director of Agriculture, under training in the VI Circle to be in charge of the VI Circle, vice Mr. R. C. Broadfoot on other duty.
4. Mr. K. Gopalakrishna Raju, Assistant Director of Agriculture, doing duty as Superintendent, Central Farm, to be Assistant Director of Agriculture, VI Circle, Madurai.
5. Mr. K. Ramiah, Assistant Economic Botanist, Aduturai, to be in charge of the Office of the Government Economic Botanist, vice Mr. F. R. Parnell, granted leave.
6. Mr. C. R. Srinivasayyengar, Assistant in Economic Botany, to be in charge of the Office of the Assistant Economic Botanist, Aduturai, vice Mr. K. Ramiah on other duty.
7. Mr. M. V. Narasimha Sastri, to be a Lower Subordinate, V grade, on probation, in the Chintaladevi Cattle Farm.
8. Mr. A. Gopalakrishnayya, Farm Manager, Hagari, on the expiry of his leave on 8-5-1924, to join duty at the Cattle Farm, Chintaladevi.
9. Mr. H. E. R. Dunhill, Assistant Industrial Engineer, Coimbatore division, is appointed Assistant Agricultural Engineer, Coimbatore with effect from the 18th April 1924 on probation for one year.
10. Mr. K. Jagannadha Rao, Agr. Demonstrator, VIII Circle, transferred to II Circle as Farm Manager, Hagari.
11. Mr. P. S. Venkuswami Aiyar, Asst. Agr. Demonstrator VI circle, transferred to IV circle, to join on expiry of leave on 3rd April 1924.

Services placed at the disposal of the Government of India

The Services of Mr. G. R. Hilson, Cotton Specialist, Madras, are placed at the disposal of the Government of India with effect from or after 15-3-1924 for appointment as Officiating Secretary to the Indian Central Cotton Committee.

Leave:—

1. Mr. Samuel Jobitharaj, Assistant in Economic Botany, leave on average pay for one month from 31-3-1924.
2. Mr. N. Parathasarathy Ayyangar, Offg. Assistant in Economic Botany leave an average pay for 13 days from 31-3-24.
3. Mr. M. Raghavalu Naidu, Agricultural Demonstrator, leave on average pay for two months on medical certificate.
4. Mr. R. G. Mal, Agricultural Demonstrator, leave on average pay for three months from or after 2-4-1924.
5. Mr. R. Swami Rao, Agricultural Demonstrator, extension of leave by two weeks.
6. Mr. Azizuddeen Sahib, Sub-Assistant in Economic Botany, leave on average pay for four months from or after 20-3-1924.
7. Mr. R. Subbayya Kavundar, Sub-Assistant in Economic Botany, leave on average pay for two months from or after 15-3-1924.
8. Mr. V. M. Ramannikidavu, Assistant Farm Manager, Peer-made, leave on average pay for two months from or after 31-5-1924.
9. Mr. V. Narasimhasastri, Assistant Farm Manager, leave on average pay for three days and leave without allowances for two months and 27 days in continuation thereof, with effect from 19-2-24.
10. Mr. M. L. Narayana Reddy, Assistant Farm Manager, Chintaladevi, leave on average pay for 15 days from 3-4-1924.



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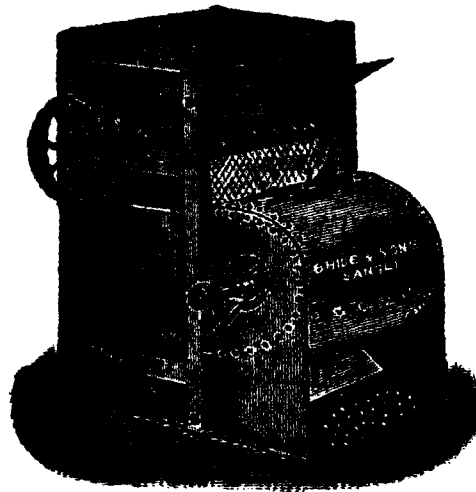
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(vi)

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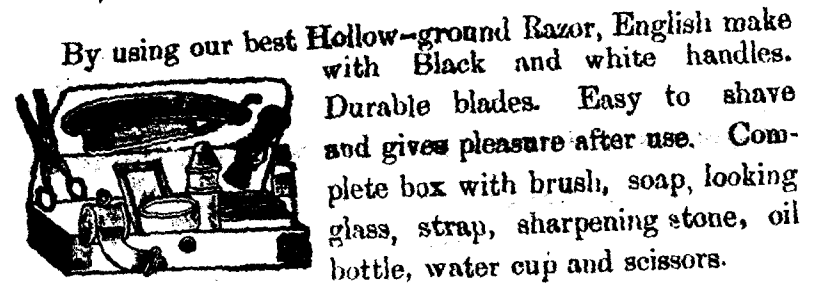
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(சென்னை.)

(vii)

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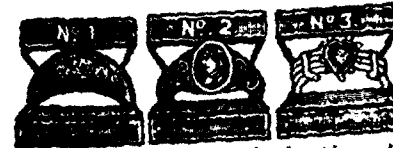


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