

Journal of the Madras Agricultural
Students union.

V 12. no. 5. May 1924.



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THE JOURNAL
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THE MADRAS AGRICULTURAL STUDENTS' UNION.
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If not, send in your correct address.

OF

Vol. XII.

MAY 1924.

No. 5.

Industrialism and Agriculture.

R. BALASUBRAHMANYAN, B. A., B. Sc. Ag.

It is an admitted fact that Indian Agriculture is becoming more and more commercialised. Agricultural statistics bear testimony to this fact, showing the rapid increase in area under industrial crops viz., cotton, groundnuts, tobacco etc. as compared with the area a decade back. Money crops are unreservedly encroaching upon the food and fodder area, and industrialism real and apparent threatens to revolutionise agriculture by taking monopoly of the latter in the near future.

It is a tendency of the population to increase faster than the means of subsistence, in spite of the natural checks at play as mortality and prudence. There is also a progressive tendency in every nation to increase gradually its production, and thus advance in material prosperity. One of the chief features of this economic progressive movement is the unlimited growth of man's power over nature. The increasing knowledge in physics and chemistry is being more rapidly converted into physical power by practical ingenuity surpassing the imaginary feats of a magician. The manual part of these is keeping pace with the intellectual, and the skill required for the delicate workmanship is not wanting in a sufficient number of workers.

The following Back Numbers of the Union Journal are available for sale. These will be sold at a concession rate of TWO ANNAS per copy. As only a few copies are available applications for the same must be made without delay. All orders must be accompanied by a remittance of the full cost of the copies ordered for, failing which the cost will be realised by V. P. P.

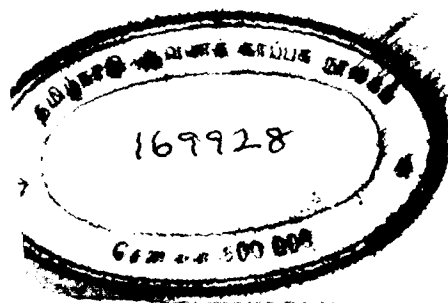
Vol. 1. Nos. 3 & 4	Vol. 7. Complete.
Vol. 2. Nos. 1, 2, 4	Vol. 8. do
Vol. 3. All except 1, 2, 4	Vol. 9. do
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MANAGER,
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(Sd.) A. T. PANNIRSELVAM,
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community. The progressive movement leads us to expect a vast multiplication and long succession of contrivances, for economising labour and increasing production, and to an ever widening diffusion of the use and benefit of these contrivances.

An eminent writer remarks that "so long as mankind remained in the semibarbarous state, with the indolence and the few wants of the savage, population was not restrained and the pressure of physical want was a necessary stimulus, to the exertions of labour and ingenuity required, by which the industrial life attained predominance over the pastoral, military and the predatory state." The checks to population may be considered as non-existent among the common agricultural labourers. With their present habits they might have faced abject misery and poverty, had it not been for the growth of towns, and capital employed therein, notwithstanding their rapid increase, and the absorption of the greater part of these annual additions to the rural population. Even under the present conditions their lot is sufficiently painful to contemplate. They are common objects of popular compassion. Imagine labourers of India, with large families and 4 or 5 Rupees a week when in full employment, and you have some glimpses of their economic condition.

Discussion on the condition of labourers, over their wretchedness, and denunciations of all who are supposed to be indifferent to it, and projects of one kind or another to improve it were in no country of the world so rife as now, but there is a tacit agreement to ignore the law of wages altogether. Different kinds of work are paid for at different rates, depending to some degree on certain laws, but in no case the disparity is so obvious as between agriculture and other sister arts. There is a natural monopoly in favour of skilled labourers, against unskilled, which makes the difference of wages exceed, sometimes to a manifold proportion. The wages in agriculture are to a large extent fixed and regulated by custom, and labour does not require the delicacy, skill and intellectual application of other crafts apart from the physical hardship and endurance. There is a marked degeneracy of mankind, and the muscular exertions cannot be applied to the same degree as in the days of old. The idea of comfort has taken a strong hold upon their minds amidst the modern luxuries that rules have to be framed regarding hour of work. Even granting that an extra amount is due by right to intellectual gift, to maintain the disparity between them to such a wide degree is uncharitable, and there appears to be no hope of redemption for them, from their economic and social downfall.

Emigration and industrial centres remove a major part of the common rural population leading to a grave de-population of villages.

Agriculture to which industry looks for raw materials will be made subservient to the latter, if steps are not taken to emancipate it from the impending thralldom.

Big educated land lords sell away their lands with the idea of launching forth industrial schemes, which are sure to bring them increased revenue or they take up to farming on scientific lines giving a commercial trend to the whole project. The latter attempt necessitates purchase of agricultural machinery to place it on a high level of efficiency. If everybody takes up to this kind of farming, the country will of course become richer, but it will be placed on the same level as Great Britain which depends for its daily bread on America and other countries. India has been very often styled the land of plenty, and if agriculture will be advised, to keep itself free from the villainous clutches of industrialism, without being carried away by the alluring prospects of money, it can safely stand on its own legs without looking to other nations for its food; if not there may come a time when it will have to face starvation amidst plenty.

The law of diminishing returns puts a check to agricultural production. Unlike industries, where an increase of capital or labour, or both, involves increased production to a greater extent proportional to investment, the law in agriculture is that the produce of the land increases, in the diminishing ratio to the increase in labour and hence production cannot be indefinitely increased, to meet the demands of a nation. In other words, in industries increased production takes place at a smaller cost while in agricultural industries, increased production takes place at an increased cost. The tendency being towards perpetual increase of the productive capacity at a lesser cost in industries in agriculture the cost of production is lessened by improvements and augmented by every addition to population.

In a society advancing in wealth population increases faster than agricultural skill, and the food consequently becomes costly, and a strong impulse sets in towards agricultural improvement; such a tendency has shown itself in other countries, and India will be driven to such a happy crisis, if there are no evidences of prudential checks, regarding the growth of population.

After all is said and done, we welcome industrialism as a happy phase in the history of Agriculture, and India would do well to imitate America as regards its policy towards both agriculture and industrialism. Had America neglected and shown a fond preference to industries, she would not have been what she is now, for all her wealth and position. Will India deign to take a lesson from America, and not grudge to allot a few lakhs of rupees for agricultural improvement in the budget?

Korai Grass Cultivation in Karur Taluk.

N. SUBRAMANIAM L. AG.

Korai grass is a kind of grass used for weaving mats. The cultivation of this grass has of late years increased in importance in this taluk and people take to it as a paying concern. The grass is cultivated in padugai lands of both the Amaravati and Cauvery rivers in Karur taluk. These padugai lands are taken for cultivation under lease by a few mirasdars, who, in their turn sublet them in small extents to others for cultivation. This grass is cultivated by a special class of people called Oddakkars. Some Muhammadans and Kaikolas also cultivate this to some extent. In addition to local supply, the grass is mostly exported to parts of Tinnevely, Dindigul, Trichy and Salem. It is now becoming a profitable crop for cultivation. There is now a keen demand for the grass and the price of the same has risen considerably during the past few years.

Soil. Padugai lands receiving heavy deposition of silt during floods and having good irrigation and drainage facilities are the best suited for its cultivation.

Season. The planting season is March.

Preparation. The land is dug thoroughly with mammaty to a depth of 1'-6" in January when the soil is in a good friable condition. The soil is then turned over twice and the grass and other weeds are completely picked and removed. In February small beds 8' x 9', similar to ragi beds, are formed with irrigation and drainage channels at suitable distances.

Selection of seed nuts. and Planting. Nuts are dug in February from old plantations, the clods of earth broken and removed and the nuts are then cleaned free of grass and other weeds. These are then put into pits and water is sprinkled over them. These pits are covered over with grass for hastening the germination of the nuts. The nuts are removed from the pits at the time of planting when they would have just put forth small sprouts.

Planting. In March shallow furrows of 2" depth are made with mammaty at distances of 4" to 5" and the nuts are placed close together longitudinally along the furrow. This is covered over with the earth removed from the next furrow and the beds are watered. Sprouts come out in 2 or 3 days.

Irrigation and after cultivation. The beds are watered from channels once in 10 or 15 days. Much attention is to be paid to keep the fields clean of weeds which are to be dug, picked and removed twice in a year. This is done after each harvest is completed.

Harvest and preparation. The harvest is done only in bright weather which is very essential for the drying of the grass; else the grass will be completely spoiled and decoloured. Hence the interval between two harvests and the number of harvests in a year depend upon seasonal circumstances and the growth of the grass which is controlled by the nature of the soil. The grass comes to harvest in about four months after planting, viz., in July when it would have grown to a height of 8' to 9'. The next harvest is done in December. The best practice is to take two harvests in a year, viz., one in July and the other in December. But from the third year after planting some take 5 crops in two years.

The grass is cut close to the ground with curved sickles which are specially shaped for the purpose. Then the cut grass is placed with the butt ends together and bundled up. The top portion of each bundle bearing the inflorescence is cut off evenly according to the growth of the grass. These bundles are sorted into different grades according to the length of the bundle. They are removed to the river-bed, opened out and dried for a few hours. This is done to make the grass elastic. The grass is split longitudinally and spread in the sand for two or three days for further complete drying. It is then bundled into required sizes, usually with a girth of 48". The grass is then ready for market. All these operations from cutting to final bundling are done on contract system at one rupee per bundle of dried grass of 48" girth. The yield depends upon the soil where it is grown, upon the amount of alluvium deposit received by the land every year, and also upon the care and attention paid in cultivation. For the first year each cutting gives forty bundles per acre and for the remaining period each cutting gives fifty bundles of dried grass of 48" girth. It is not advisable to keep the crop for more than seven years in one field.

Cultivation Expenses per acre.

Initial expenses.

Digging the land once and turning the soil twice. ...	Rs.	120	0	0
Picking and removing weeds. ...	"	25	0	0
Forming beds and channels. ...	"	6	0	0
Digging nuts from old plantations. ...	"	10	0	0
breaking and cleaning. ...	"	22	8	0
Forming small channels and planting nuts. ...	"	20	0	0
Removing weeds, etc., and hoeing twice. ...	"	203	8	0

Recurring expenses.

Weeding and hoeing charges for 6 years 12 times. Rs. 120 0 0
Cutting, splitting, drying and bundling.—

1st year. 80 bundles.
Next six years. 600 do

Total. 680

Contract rate for 680 bundles of 48" girth at Re. 1 per bundle.

Lease amount at Rs. 100 per acre for 7 years " 680 0 0
" 700 0 0

Total. " 1,500 0 0

Grand total. " 1,703 8 0

Value of produce.

Value of 680 bundles at the average price of Rs. 6 per bundle.

Total expenditure for seven years. " 4,080 0 0
Rs. 1,703 8 0

(Net profit per acre for seven years.) " 2,376 8 0

[N. B.—This is strictly speaking a 'sedge' and belongs to the Natural Order Cyperaceae—Editor.]

Agricultural Education.

By M. R. BALAKRISHNAN, B.A., B. SC. AG.

It has become a matter of common hearsay that in India—essentially an agricultural country—the so-called educated classes take very little interest in agriculture. Attempts of the Government—various and attractive—to stimulate an agricultural mentality have so far met with a poor response; and, more often than not, authorities have been obliged to use all their analytical and thinking powers to give adequate and plausible explanations for these failures. While these various explanations put forth from time to time and the consequent changes necessitated thereupon, in the educational policy of the Government in the matter of agriculture, have temporarily satisfied the changing needs and temperaments, none have so far solved the problem thoroughly and enduringly.

The reason is not far to seek if we bear certain factors in mind. India is an agricultural country—but in Agriculture as in other things, the people have little faith in the efficacy of a sudden revolution and an overthrow of the old practices. The fact must not be lost sight of that to convince a layman of the superiority of a method which you are advocating—you have to be thoroughly conversant with his methods. Most often unfortunately we betray an ignorance of existing conditions while we are over-enthusiastic in advertising remedies.

To a great extent ourselves and in a small measure the Government are responsible for this state of affairs. Though happily times are changing, there has been till recently a glamour amongst us for Government Service. So great and potent has been this factor, that in many cases the people have been tempted to use any and every qualification to enter the precious portals of Government Offices. Such a mental attitude has developed still further by the opening of more and fresher vistas of alluring service.

The Agricultural Department is one such inviting walk of life. The public are tempted to think that instead of teaching better ways of cultivation and so on—the Agricultural College at Coimbatore is to turn out fresh men every year who are at once qualified to become Government servants with lucrative prospects. Nothing can be farther from truth.

All scientific innovations are best appreciated by men of science and by those who are unmistakably benefited by such innovations. Agriculture as an important science shares this dictum with other sciences and it will be absurd to negative it. Before we can confidently look forward to departmental suggestions being received favourably—we must do one of two things. We must educate the masses to a higher scientific standard or show them that scientific agriculture is most certainly profitable. The latter we cannot hope to do for a number of years to come, since convincing results from agricultural experiments can accrue only after years' labour and tabulation—beset as we are with many factors over which we have no control.

The former, however, namely to educate the masses—is certainly for easier to achieve, provided it is done with method. Education has to be imparted both externally and internally—the former by the Government and the latter by the people themselves. The Agricultural College at Coimbatore cannot alone be expected to do this. Agriculture, I contend, is certainly not on a par with engineering, medicine and other professions and must be placed on a different footing. If people do not feel interested in agriculture they must be

made to feel it, why not—instead of locating the college in a small town and spending inordinate sums in advertising—try to introduce agriculture as an optional or even a compulsory subject for the School final and intermediate Examinations? This will certainly not cause more expense to the Government and the effects will be more far reaching. Ignorance, sometimes unjustifiable, will vanish and general understanding and knowledge will be bettered. Why should we look to the Government while other countries much less agricultural associations? Is it not because they are more educated and thus have more facilities for obtaining a general all round knowledge of things.

Only those outside the department and out of the estate can have an idea of the thoroughly erroneous opinions—better they were no opinions—which people have of our department; while research work has to be going on independently, active ~~total~~ ^{total} ~~agrandist~~ ^{agrandist} work has to be effected first and ~~then~~ ^{then} the Government ought to help in this.

It is not enough if they find more men and send them out to various places in the Presidency. They must see that the importance of agriculture is recognised by the University and the educational department, and direct more of their activities to stimulating the agricultural instincts of the juvenile population than to attract qualified (?) men to take to the honourable profession of the plough. Is it too much to hope that young and sincere men are not wanting to come forward to devote their energies for popularising the cause of agriculture and bring about the desired end? For, in agriculture alone, lies after all the salvation of our motherland.

EXTRACT.

Determination of Experimental Error—"Student's" Method.

Re-print from an article by H. H. Love in Journal of the American Society of Agronomy, Vol. 15, No. 6 (1923)

The formulae that are in common use for the calculation of probable errors in field experiments are the two known as Bessel's and Peter's. These are as follows:—

Bessel's formula.

Probable error for a single determination P. E._s = $\pm .6745 \sqrt{\frac{Td^2}{n-1}}$

Probable error for a mean P. E._m = $\pm .6745 \sqrt{\frac{Td^2}{n(n-1)}}$

Peter's formula.

Probable error for a single determination P. E._s = $\pm .8453 \sqrt{\frac{T+d}{n(n-1)}}$

Probable error for a mean P. E._m = $\pm .8453 \frac{T (+d)}{n\sqrt{n-1}}$

In these formulae P. E._s and P. E._m stand for the probable error of a single determination and the probable error of a mean; d refers to the deviation of the different items from their mean and n to the number of items. The sign T shows that the values d² and d are to be summed. The meaning of (+d) is that the deviations are summed without regard to sign.

There seems to be some misunderstanding regarding the use of these two methods. There is a similar relation between these two methods to that between the standard and the average deviation.

The formula for the average deviation for an ordinary frequency distribution is A. D. = $\frac{T (+fd)}{n}$ in which A. D. stands for the average deviation, T (+fd) means that the deviation from the average of the series are multiplied by the frequency of their occurrence and then added without regard to sign, and n refers to the number of individuals concerned.

The formula for the standard deviation is S. D. = $\sqrt{\frac{T. fd^2}{n}}$

There is a rather definite relation between the average and standard deviation. That is, the average deviation is about .7979 S. D. From this relation we derive the value .8453 from the following.

$$\begin{aligned} \text{S. D.} : \text{A. D.} &:: 1 : .7979. \\ .7979 : 1 &:: .6745 : X \\ X &= .8453. \end{aligned}$$

These two formulas give practically the same results as the following will show.

Probable error of corn yields.
Calculated by Bessel's and Peter's Methods.

Yield per plot.	Deviation from mean.	Peter's Formula:	
		P.E. _s	$\frac{T(+d)}{\sqrt{n(n-1)}}$
28.6	-1.1	1.21	$\pm .8453 \frac{16.9}{\sqrt{90}} = \pm 1.51$
28.6	-1.1	1.21	$\pm .8453 \frac{16.9}{10\sqrt{9}} = \pm .48$
30.6	.9	.81	
Yield per plot.	Deviation from mean.	Bessel's Formula:	
		P.E. _s	$\frac{T d^2}{\sqrt{n-1}}$
28.6	-1.1	1.21	$\pm .6745 \frac{\sqrt{44.59}}{\sqrt{9}} = \pm 1.5$
32.0	2.3	5.29	$\pm .6745 \frac{\sqrt{44.59}}{\sqrt{90}} = \pm .47$
34.3	4.6	21.16	
30.0	.3	.09	
27.1	-2.6	6.76	
27.1	-2.6	6.76	
30.0	.3	.09	
296.9	16.9	44.59	
M. 29.7			

There is a further possible question regarding the relation between the probable error of the mean as calculated in the usual way and that calculated from Bessel's formula. This will be cleared up by the following relation.

The probable error of the mean as obtained from the standard deviation is $P. E. _m = \pm .6745 \left(\frac{S.D.}{\sqrt{n}} \right)$ Now $S.D. = \sqrt{\frac{T f d^2}{n}}$

$$\text{Hence } P.E. _m = \pm .6745 \left(\frac{\sqrt{\frac{T f d^2}{n}}}{\sqrt{\frac{n}{n}}} \right) = \pm .6745 \sqrt{\frac{T f d^2}{n^2}}$$

while the probable error of the mean from Bessel's formula is equal to $\pm .6745 \sqrt{\frac{T d^2}{n(n-1)}}$

The difference between the two is that in the first formula the denominator is n^2 while in the second it is $n(n-1)$. Thus, for ten observations the denominator is 100 in the first case and 90 in the latter. There is no need to go into detail as the reason for this other than to say that for few observations it is more accurate to decrease the value of n by one.

It is proper to use either method to express the probable error of the mean and if either Bessel's or Peter's formula is used, the calculations are simplified by using tables such as have been prepared and appear in various text-books dealing with the subject.

There are certain limitations as to the use of either of these formulas. One is in regard to the number of observations. It cannot be held that for a few observations is the result as reliable as for many; nevertheless, it is better to calculate the probable error for even a small number of observations and then use judgment in drawing conclusions. It seems that even in such cases the probable error furnishes a good safeguard for the interpretation of results.

Another limitation in connection with these formulas is that in certain cases observations have been taken under such conditions that the probable error resulting is very large and renders the drawing of conclusions very difficult. An illustration will probably make this point clear. Two varieties, A and B were compared in variety tests for six years.

The results are as follows:—

A.	B.
79.6	77.2
49.7	53.5
46.5	66.1
63.8	65.8
42.4	52.4
47.7	57.3
Average 54.9 ± 3.9	62.0 ± 2.6

Here the difference is 7.1 bushels, but the probable error of the difference is $(4.7 = \sqrt{(3.9)^2 + (2.6)^2})$ bushels. From this it is not possible to say there is any real statistical difference between the two sorts. In this case the probable error is large because of the variation in yield due to seasonal differences. It should not be said, however, that for this reason the probable error should be discarded as useless in cases of this sort. It may be that there is a better way of applying it. There are two ways of treating this kind of material. The matter of interest is the difference between A and B. The first way this can be handled is by determining the difference and then the probable error of this difference by Bessel's formula, in the usual way. This shows an average difference of 7.1 bushels with a probable error of ± 2.12 . The difference is about 3.35 times the probable error which leads to odds of about 40:1 that B. is a better variety than A. The second way of treating this kind of statistics is to use a method known as "Students". This method has been described in *Biometrika*, Vol. 6, pages 1-25. An extension of the table used in the interpretation is given in *Biometrika* Vol. 11, pages 414-417.

This method has been little used in interpreting results in experimental work. (Probably it has been overlooked. In a recent bulletin (No. 173) from the Pennsylvania Agricultural Experiment Station, Anthony and Warning have used this in connection with orchard experiments.) This is a very valuable method and after using various ones with many different kinds of data, it seems to the writer to be the best one to use whenever possible. This method consists in finding the difference between the two items compared and then the mean difference. From this mean the standard deviation of the several differences is found by the usual formula, $S. D. = \sqrt{\frac{1}{n} \sum d^2}$

The ratio of the mean to the standard deviation is then obtained and by "Student" is designated as Z. From this value and using "Student's" tables, the odds that the mean difference is significant can be obtained.

The following comparison between varieties A and B will make this clear.

A	B	D	D'	D ²
79.6	77.2	-2.4	9.5	90.25
49.7	53.5	3.8	3.3	10.89
46.5	66.1	19.6	12.5	156.25
63.8	65.8	2.0	5.1	26.01
42.4	52.4	10.0	2.9	8.41
47.7	57.3	9.6	2.5	6.25
		M 7.1	6	298.06
		$\sqrt{49.676667} = 7.048$		49.676667
		$\frac{M}{S.D.} = Z = \frac{7.1}{7.048} = 1.007$		
		P = .9623	Odds 25.5:1.	

Here the odds are 25.5:1 that the mean difference 7.1 bushel is significant.

The method is very valuable and will find wide application as it is more generally understood.

If "Student's" method is to be used, it will be desirable to keep as many check plots in the test as possible, for in this way there is a better means of obtaining differences due to treatment or variety. "Student's" method can be used however, without checks either in a variety test or in soil work by directly comparing two varieties or one treatment with another. For example, in a variety test, comparisons may be made between different sorts and the best yielding one or in soil work a NP plot may be compared with a P plot and so for the different groups.

In this paper, it is not necessary to point out examples where the use of probable error would have changed the conclusion or anything of that sort.

Such examples can be found in far too great numbers. What is needed is to get clearly in mind the use and application of the probable error so that one can know how it can be applied to his own work. This is very important in planning new experiments. From the results of earlier experiments, it is possible to determine how many plots under given conditions it will be necessary to run to reach a certain precision.

One of the greatest difficulties that every experiment station and every agronomist has is that more experiments are needed than there is available means or land on which to conduct such experiments. The result is that in many cases too many different kinds of treatments or too many varieties, etc., have been used so that the results are not final and in some cases not reliable. Too many conditions have been measured poorly rather than a few well. It seems that many investigators are guilty of this charge. The trouble has been that there has been too much pressure to get results and get them quickly. One instance that has been brought to the writer's attention is that in planning a new experiment, which is to run a good many years so many different kinds of tests are to be conducted that there is not opportunity to replicate some of the more important ones. In such a case it would be far better to determine a few facts accurately than many, with a question as to their reliability.

There may be a tendency by some investigators to interpret the probable error rather loosely. There is great danger in this and it should always be kept in mind that the probable error which has been calculated refers only to the conditions for which it has been determined. It indicates that under similar conditions similar results with similar variations may be expected. There is just as much likelihood of error in using the probable error too loosely as there is in not using it at all. The conditions under which the experiment has been conducted should be well considered in connection with the interpretation.

Treatment for worm infections in Domestic Animals.

Liver Fluke. The only curative treatment thus far giving satisfactory results is the following:—Ethereal extract of male fern, given in the following doses:—For cattle, 2½ to 6 drams, mixed with 20 c. c. oil; (b) for sheep, 45 to 75 minims, mixed with 10 c. c. oil. The dose must be repeated on five consecutive mornings, two hours before the animal is fed.

Tapeworms: in Calves,—(a) Turpentine, 1 to 2 oz. of raw linseed oils, given after fasting for 12 hours. (b) Arecanut, 2 to 3 drams, given in a branmash after fasting for about 12 hours. This must be followed by a purgative about 3 hours later.

(2) In Lambs: Kamala, 50 to 60 grains in a cup of milk early in the morning.

(3) In Horses: (a) Turpentine, 1 to 2 oz., mixed with a pint of raw linseed oil, given the morning after starving overnight. The dose may be repeated for two or three mornings. (b) White arsenic, 4 grains; tartar emetic, 1 dram; iron sulphate, 2 drams: given in the food each morning for six days, and then followed by purgative.

(4) In Dogs: Pups—arecanut powder, 2 grains per lb. body weight, mixed with butter, followed two hours later by ½ oz. castor oil. Adult dogs—ethereal extract of male fern, 2½ drams, mixed with 1 to 1½ oz. castor oil.

(5) In Fowls: Arecanut or kamala, 30 to 45 grains, made into a pill with butter, followed an hour later by one third grain of calomel.

Roundworms: (1) In Sheep (Lung-worm).—The following injection to be made into the windpipe: Carbolic Acid, 5 minims; chloroform, 15 minims; turpentine, 30 minims; and olive oil, 30 minims. The injection must be repeated every second or third day on two or three occasions.

(2) In Cattle: (a) turpentine (see tapeworm) (b) Sore eyes (due to worm injection) tobacco water or corrosive sublimate in a dilution of 1 in 2000.

(3) In Horse: See Tapeworm.

(4) In Dogs: Oil of chenopodium, 2 minims, per lb. body weight, with maximum of 1 dram; chloroform, 2 minims per lb. body weight, with maximum of 1 dram; castor oil, ½ to 1 oz.

(5) In Fowls: Thymol, ¼ grain made into a pill with flour, followed two hours later by a teaspoonful of sweet oil.

(Union of South Africa, Journal of the Department of Agriculture)

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REVIEW.

Cotton in Tanganyika Territory:—

Mr. R. C. Wood, has contributed an interesting article on cotton in Tanganyika to the first number of the "Empire Cotton Growing Review" from which the following is abstracted for information of the readers of this journal.

In 1913 the export of Cotton from the Territory which was then under the Germans was over 6 million pounds. This was the result of ten years' strenuous work. The chief variety was Egyptian, the country south of the Central Railway is suitable for cotton, the northern portion being affected by rain which interferes with the ripening of bolls but a hardier type like the Nyasaland—An American Upland—would, as in the present year, get on much better. Last year over the whole territory 2,870,000 pounds of kappas was obtained. The Germans in their day had introduced capitalistic as well as small farming methods. As cattle cannot be used on account of the tsetse fly, costs of cultivation especially the labour item bulks largely in the expense of production. There is at present no incentive for the native to grow cotton. It must arise from two causes: the necessity, he is under, of paying Government hut or poll tax and the personal influence of the District Administrative officer.

The holdings (*shambas* as they are locally called) are cultivated on a very primitive scale of agriculture. The land is cleaned by hand of the grass and shrubs and trees, the refuse collected and burnt. The land is then lightly dug out and when the rains are received holes are made at random and 4 to 5 seeds, dropped. The crop is hoed and the kappas picked is fairly clean. The two obstacles a cultivator in Rufigi and Morogoro districts has to overcome are a rank growth of weeds in the very deep and fertile alluvial soils, and the depredations caused by wild animals, elephant, buffalo and pig.

The next consideration is marketing. In German days the difficulty was overcome by fixing a guaranteed price as the native was ignorant of markets and the laws which govern prices, though suspicious of all fluctuations whether natural or artificial.

The present Government, however, have substituted a series of Government auctions or special licences and all cotton is sold between September and December.

As the country has not been opened up by railways, transport is very difficult and the conditions are not very cheerful at present but indicate early improvement.

The two Government Agricultural Stations at Mpanganya and Morogoro are doing good work and will surely aid in the development of cotton cultivation and its spread.

Agricultural Mathematics (Anakapalle), Govt. Press, Madras
Price Rs. 3-2-0.

This is a companion volume to the author's *Agricultural Mathematics* (Taliparamba). Mr. V. Raghunatha Ayyar of the Educational Department who was entrusted with the compilation of these books on mathematics for Agricultural Middle Schools has done his work with care, assiduity and an amount of painstaking associated with few men at the present day.

Though written with a view to aid a teacher of the secondary grade training to handle mathematics in a practical manner, it creates an agricultural atmosphere, gives a distinct agricultural bias and covers a very wide field and in our opinion will be found suitable by a larger circle of teachers and pupils. The variety of problems dealt with, the intimate knowledge of the subjects evinced, the treatment and the easy 'gradient' along which the beginner is led from problem to problem, mark the excellence of the book and single it out as fit for an enduring place in the libraries of all important schools in this Presidency. We congratulate Mr. Raghunatha Ayyar on his production and shall await the publication of 'Agricultural Geography' that was taken up about three years ago by a colleague of his.

GLEANINGS.

Conferences. The Fourth International Conference of Soil Science was held at Rome on 11-19th this month. No Indian investigator attended or contributed papers.

Amongst the papers given by American Investigators we find the following:—1. The influence of plant growth upon the state of Aggregation of soil particles, 2. The significance of soil reaction in controlling Nitrogen fixation, 3. The mineralization of atmos-

pheric Nitrogen in Nature by biological means. 4. Magnesia as a factor in soil productiveness. 5. The investigation of the soil from the point of view of the physiology of the plant.

A similar conference of Botanists meets in London in July and of Sugarmen in Honolulu in August next.

V. M. A.

56,000 acre Estates sell for 2d., per acre. At the sale in London on 4-3-1924, Lord Leverhulme's properties in the island of Lewis were offered when the Estate of Galston extending to 56,008 acres was sold for £500. Galston produces a rent roll, excluding shooting, of £1,323 per annum, and the burdens are given as £1,242 exclusive of the occupier's rates. (*Farmer and Stockbreeder, March 10, 1924*).

Alien hands in Australian sugar industry. A report by the Director of Sugar Experiment Stations, throws some light on this matter. Most of the men who have secured farms are Italians and they have gone into the Innisfail district, where there are 462 non-British growers, whereas there are about 5,000 growers throughout Queensland. *The trouble, of course, is that non-British growers are in communities and they form groups among themselves and do not become absorbed in the general population.* The position regarding cane cutters, most of whom are Italians, does not show even this favourable comparison. For instance, at one mill, there are 20 British and 215 foreign cutters. Most of these Italian cutters aspire to become owners of the land they till, so that the danger of the industry passing into the hands of foreigners, in this district at all events, is very real. (*The Louisiana Planter March 1st, 1924 page 178*).

Canadian situation. From reports published it would seem that Canada is still essentially agricultural. In 1921 the acreage under wheat was 21,261,224 acres and the total yield was 300,858,100 bushels valued at 242,936,000 dollars. The production was in excess of requirements and a large quantity was exported. The next crop is oats cultivated on 16,949,029 acres and is used as horsefeed. Besides these fodder and forage crops occupy many millions of acres. These account for the following numbers of livestock:—Horses 3,813,921, Milch cows 3736,832, other cattle, 6,469,373, Sheep 3,675,860, Swine 3,904,895, Fowls 40,000,000.

Is it any wonder that with the consequent development of cattle industries Canadians should have fought so hard with the British Parliament to remove the embargo on importation of Canadian cattle into British ports? The population of Canada is only 8.3—4 millions. Where does India stand in the matter of cattle wealth?

To purify water in a tank.—An inquiry was received recently as to the best method of preventing the formation of green slime on well water that had been pumped into an iron tank. "The water is clear and fresh", wrote the correspondent, "and I wash the tank over frequently, but within a few days this green slimy stuff appears, and gets along inside the pipes, causing considerable trouble. Kindly advise if there is any uninjurious chemical, or what method I could adopt, to prevent the growth. The water is used for domestic purposes."

The writer was advised to clean out the tank and cover it so as to exclude the light. Simple aeration of the water in the tank by blowing air into it would tend to prevent the abundant development of the algae (vegetable growths) with their objectionable tastes and smells. The following methods were suggested for the chemical purification and elimination of algae, etc.—

1. Bleaching powder, used at the rate of 2 to 2½ oz. per 1,000 gallons of water. The chloride of lime should be mixed in a bucket with water, and the contents added to the water in the tank, and stirred through the mass.

2. Prepare a fairly strong solution of permanganate of potash in water. Add this in small quantities at a time to the water in the tank, stirring well after each addition until the bulk water acquires a very faint pink colour. The final depth of colour may be observed in a tumbler

3. Copper sulphate (bluestone) is a highly effective algicide, and is extensively used in large water reservoirs, but the amounts used must be very accurately measured. It should be used at the rate of one part bluestone to six million parts water, or 12 grains (actually 11.7) per 1,000 gallons.

In using any of the above methods, two tanks may be employed, in one of which the purification process would be proceeding while the other was being used for any necessary purpose.

A. A. RAMSAY, CHEMIST.
(*Jour. Dep. Agr. Victoria*).

Record yield by a Karachi Cow. Since the breed of cows in Sind generally yields a large quantity of milk, the Animal-breeding Department, Bombay took over the Malir and Kandhi farms in the suburbs of Karachi and the average yield per cow has now risen to nearly 15½ pounds per day. Six cows at Malir farm are now yielding over 5,000 pounds of milk per lactation year of 300 days, whilst one special cow is now estimated to have yielded approximately 10,000 pounds in 300 days—a record for India.

Justice, April 19, 1924.

Sugar notes. (1) The new democratic Kemal Government is instinctively turning its attention to the improvement of its internal source of supply in the matter of sugar. It believes that no genuine progress can be made till there is a good supply of this important article of food. A corporation has been formed in Asia Minor with a capital of 300,000 Turkish pounds and a factory is soon to be erected with an out-turn of 20 tons of sugar per day.

(2) From Madagascar is reported a very interesting experiment at transporting dried canes to a central factory, the extraction of sugar being made in the factory as time is available. Such canes powdered gave the following analysis:—Humidity 3.45, Sucrose 60.36, Glucose 2.71, Salts 0.52, Organic on-sugar 3.02, Cellulose, gums 29.38, Mineral matters 0.62, Total 100.00.

T. S. V

"Council of State Debates" on Sugar Industry.

Discussion on 10th March Vol. IV No. 18, page 511.

"I have recently had a very interesting conversation with Mr. Venkatraman on the subject and he hopes to be able to solve on the botanical side the problem of finding a cane suitable to the climatic conditions prevailing in Upper India and enabling factories to continue the process of manufacture without a break so that the yield to the manufacturer may be nearly as good as it is in Java."

(Speech of the Hon'ble The Member for Education, Health and Lands).

Discussion on 12th March Vol. IV No. 20, pages 535 and 536.

"If we take into account the average yield of the local varieties, which does not exceed 300 maunds of stripped cane per acre, each of these Coimbatore canes yields over double the amount.

".....It is obvious that the adoption of the canes by growers in Bihar will considerably add to the profits of cane cultivation, while the sugar industry will get an increased supply of cane for the factories which are usually below their raw material capacity and also enable them to prolong their working season, reducing the cost of production per maund of sugar by cutting down silent charges."

(Speech of the Hon'ble The Member for Education, Health and Lands.)

World sugar supplies.—The Louisiana Planter for March 8, makes a very appreciative reference under the above heading to a report issued this year by Lamborn and Company, New York. The compilation furnishes details relating to production, consumption and stocks of sugar in ninety countries of the world. "The forecast for 1923-24 is for a production of 19,886,000 tons with a consumption of 19,808,000 with a margin of probable error in production of 275,000 tons and consumption of 290,000 tons in the world's supplies." Changes which take place in stocks in several countries are definitely indicated and the report is of special value to the sugar world.

Army worm. Union of South Africa Journal for March 1924 recommends baiting as one of the universal measures for infestation of the army worm. The bait may be made of bran or other food stuff or finely cut green stuff. The other ingredients are arsenite of soda (or other insecticide form of arsenite,) sugar or molasses and water. The proportions are one pound of arsenite, two pounds sugar with as much bran or finely cut green stuff as the liquid will thoroughly moisten. Sixteen gallons (equal to four kerosine tins) are sufficient for 150 lbs. of green stuff.

Bran bait is easy to prepare and to spread. The bran should be sprinkled and meanwhile turned over and over until it is uniformly moist, but not sloppy, when it is wetted to the right consistency it can be broadcasted so thinly that no stock can pick it up. Green stuff is best wetted by immersing it in the liquid: it should then be drained. The bait can be spread in grain crops at about 100 pounds to the acre. It is advised that a few furrows be ploughed immediately in front of the moving mass of worms and then heavily baited. The soil can be harrowed afterwards and thus any danger to stock removed.

Poison bait for cutworms. Poison bait made of 1 lb. paris green, 24 lbs. bran and 9 quarts water in which 9 ounces of salt had been previously dissolved was laid for cutworms attacking tomatoes. Though not many dead ones were found on the following morning, fully 80 per cent. of the cutworms round each vine were dead on the second day.

(H. G. White, Superintendent, Narara Viticultural Nursery.)

Indian Labour in Malaya. We are indebted to the Planters' Chronicle of April 12, for an illuminating address, given by Rao Saheb D. Arulanandam Pillai, to the Malacca Planters' Association. Mr. Pillai shows why the South Indian Labourer does not take so kindly to Malaya to-day and manifests signs of discontent. Rao Saheb Pillai, as the Government of India Agent in Malaya, is in a position to study the subject and with the full responsibilities of a Government official, says, "When it is said that wages in a particular estate are 40 cents for man, it does not mean that the man earns anything like 12 dollars a month nor even 10.40 for 26 days exclusive of four Sundays. As a matter of fact the maximum number of days on which the coolies actually do work on the estates do not on an average exceed 20 to 22 days. Several cases have come to my notice where a large number of labourers work only for 17 days in the month". Why this is so, is not explained. From statements he had prepared of the classification of labourers according to the rates of wages and according to their actual monthly earnings less deductions on account of rice advance allowed at 6 gantangs per man and 5 gantangs per woman, a gantang being valued at 40 cents, Rao Saheb shows that 34.4 per cent of men earned less than 4 dollars, 50 per cent of women less than three dollars, a month, while as per budget of expenditure for a single male coolie furnished by an estate manager, a man requires 6.38 dollars per mensem. This excludes barber 10 cents, dhoby 15 cents, mutton $\frac{1}{2}$ lb., 30 cents, feasts and temple deductions 35 cents and upper cloth 24 cents.

Mr. Pillai emphatically denies the statement that the very large percentage of remittances to India are made by coolies.

Amongst his suggestions for improving the conditions of labour are (1) the payment of suitable wages to the labourer and making him realise his ambition, (2) affording facilities to labourers for saving a portion of their wages preferably through a co-operative scheme.

V. M. A.

Rural Studies:—Mr. Rajaiah D. Paul contributes a series of articles on "Agricultural Holdings in South India" to the "Everyman's Review" Madras. The first of the series has appeared in the April issue of this Monthly and is entitled, "The actual state of affairs."

In Mr. Paul's opinion which he shares with a majority of his countrymen, "minuteness, numerousness and scatteredness are the three evils in the present condition of Agricultural Holdings". To bring home to the forceful attention of the public, the seriousness of the situation, Mr. Paul has examined a few typical villages in North Arcot, one of the central districts of the Presidency. The account relates to four villages in two taluqs Tiruvalam in the Gudiyatham Taluk and Vengunam, Avanavadi and Nariambadi in the Wandiwash Taluk. Mr. Rajaiah has marshalled a large mass of figures and skilfully used them in elaboration of his scheme and in support of his contention. We hope his succeeding articles will be as clear, concise and free from cant as is the present and the whole series will add to the useful mass of literature on the subject.

V. M. A.

Country life. Agricultural knowledge in the United States of America, has, during the last generation, been vastly extended by researches and investigations in regard to land and capital and somewhat less widely in regard to that part of the main factor, which functions as farm labour and 'farm management'. Thus writes Mr. C. T. Calpin in the International Review of Agricultural Economics for July to September 1923.

It was the recognition of this gap which gave rise to the so-called "country life movement". The awakening led President Roosevelt to appoint a commission in 1908 which made three important recommendations.

"First was for a comprehensive plan of study or survey of all the conditions that surround the people who live in the country.

Second, a campaign for rural progress was mapped out, designed to unite the interests of education, business organization and religion into one forward movement for the rebuilding of country life.

Third, each state college of agriculture should be empowered to organise a complete department of college-extension so as to forward not only the business of agriculture but sanitation, education, home making and all the intimate interests of country life.

The report aroused universal interest and the agitation in the press, in the pulpit and on the platform has left a distinct trace in American thought, with a determination to study seriously all phases of human life as related to the farm.

Rural hope in America is high because so many farm communities can answer even now "Yes" to the question "Can you get in

your community all the modern facilities for home, comfort, trade, health, education, religion and recreation?" This, Mr. Calpin states, is the hope and test of democracy in America as it pertains to agriculture that there is no cultural discrimination against the farmers by reason of the nature of his occupation. This is the situation in America which is only 300 years old and is but a child compared with Asia and Europe. Can any one make bold to enquire what is, and to suggest what should be the state in our own country the antiquity of which is not open to question?

V. M. A.

Department of Agriculture, Madras.

Cultivation statement for 1923-24.

General. The season in 1923-24 was normal only in the Godavari and Kistna deltas, Tanjore and the Periyar tract. Elsewhere, the rainfall was ill-distributed with excessive rains in some parts and drought in most other parts.

The South-West monsoon gave torrential rains on the West Coast. It was fair in the Circars and Kurnool but elsewhere it was poor.

The North-East monsoon gave excessive rains in the coastal tracts of Ganjam, Vizagapatam, and Tinnevely. It failed almost completely in the Deccan and on the West Coast. North Arcot, Salem and parts of Coimbatore suffered from drought during both the monsoons.

The water-supply was sufficient only in the main river systems. On the whole, the year was unfavourable.

2. **Dry lands.** Sowings in 1923-24 were satisfactory in Ganjam, Kistna, and Kurnool and restricted in Anantapur, the Central and Southern districts and Malabar. On the whole, sowings in the Presidency were restricted by five per cent.

3. **Wet lands.** Sowings were satisfactory in the Circars and parts of the southern districts. They were restricted in Anantapur, Nellore, Chingleput, and the Central districts. On the whole, the area sown in the Presidency was the same as the average but less than last year by five percent.

RUDOLPH D. ANSTEAD,
Director of Agriculture.

9-5-24.

STUDENTS' CORNER.

B. Sc. Ag. Results: Owing to a clerical error, the name of Mr. M. A. Sankara Ayyar, B. A., was omitted to be included in the list of successful students of Part I. B. Sc., examination published in our last issue. We very much regret the omission.

University Convocation:—The South of India Observer of May 3rd, understands that at the next Convocation of the Madras University to be held on Thursday August 21st, the Honourable Mr. C. P. Ramaswami Ayyar C. I. E., will deliver the address to the graduates of the year.

The Short Course. Pending decision regarding the introduction of an Intermediate Course in Agriculture, no applications will, we understand, be entertained for admission into the Certificate course this year.

College Reopening. The College reopens on Monday the 16th June when Class II of the Certificate and Classes II and III of the B. Sc. Ag. Course will reassemble.

Selection for B. Sc. Ag. Course. Students for the B. Sc., Ag. course will be interviewed and selected at Coimbatore, Madras and Samalkota on 20th, 25th and 28th June respectively by a committee consisting of the Development Minister, the Director of Agriculture and Principal.

A New Seed-drill. The Cotton Specialist has introduced a new type of seed drill, which the students may with advantage to themselves examine and acquaint themselves with the working thereof.

ESTATE NEWS.

Estate Planting. Since 1st April 1924 when the control of the Botanic Garden and Estate Planting passed into the hands of the Government Lecturing and Systematic Botanist, a special officer of the Lower Subordinate grade has been added to his staff. Evidences of change are already visible. A variety of shade-tree seedlings have been planted in the new Provincial quarters and there are evidences to show that greater attention is being paid of late to the Botanic Garden than formerly.

An Amateur Dramatic Performance. The histrionic talents of some officers of this department stationed at Coimbatore found scope for development and expression when Mr. A. C. Rajagopala Ayyan-

gar organised an amateur dramatic party about 3 months ago. Working with unceasing zeal he was able to stage "Vasanthika"—a Tamil drama, on 19th instant at the Variety Hall, before a full house. The credit of organising the troupe and coaching it up is entirely due to him and the day's success, is very largely the result of the very great personal interest taken by M. R. Ry. C. Tadulinga Mudaliar and the readiness with which Messrs. Vincent Brothers placed the Hall at the disposal of the party free of rent, for both of whom thanks are tendered. Part of the profits of the day's performance has been generously offered by the organiser and his young and enthusiastic co-workers to the trustees of the late Rao Sahib. Maranna Gowder's Free Girls' School, Coimbatore. The members of the troupe are to be congratulated on the conspicuous ability displayed by them in personating the various characters.

The Lawley Road Dispensary has been closed to the public with effect from the current official year and will be maintained solely for the benefit of the residents of the Forest and Agricultural Colleges, funds being provided equally in the budgets of the two departments concerned.

The Estate Sanitary Committee. Messrs C. Tadulinga Mudaliar, V. Ramanathan, C. J. George and Gnanapragasam have been elected Members of the Sanitary Committee for 1924-25.

Scottish Pigs. Of the 4 Scottish pigs which Mr. Littlewood introduced, two died a few weeks ago, and the other two are progressing well.

Hill Recess. Messrs. R. W. Littlewood and R. C. Broadfoot are up on the hills, enjoying the concession of Hill Recess granted by Government, while M. R. Ry. Rao Sahib M. R. Ramaswami Sivan has just returned.

Visitors: Messrs Hayes and Hatch of the Ewing Christian College, Allahabad, visited the Estate during the month and Mr. P. Peddi Raju, M. L. C., Kistna District, at its close.

CORRESPONDENCE.

To

The Editor,

Madras Agricultural Students' Journal.

DEAR SIR,

I trust I shall not have to introduce myself, though I deserve to be forgotten for having left you so long without any word of me. Still, I once was at Coimbatore, even at the Agricultural College there, and I get your news regularly through this Journal.

Well, a word about myself first. Almost immediately on arrival I went off to one of the experimental Stations of the Department, Mpanganya. To reach this place, which is some 120 miles from Dar-es-Salaam, I had to go on 'safari' that is to say, I had to walk, accompanied by a string of porters carrying my tent, furniture, cooking pots and all my clothes and books. We, for I was accompanied by my assistant, took it fairly quietly, and by dint of losing our way, and making a detour to visit the headquarters station, we took seven days to reach the place, about the middle of August 1922. Here we stayed till November, making single plant selections, learning the language, Kiswahili, and getting the place into order. It had been deserted for some six years, and you can have no conception in a country like India which is thickly populated, what real unoccupied country is like. The weeds are terrific, and any land left for a year is absolutely indistinguishable from old jungle except to the expert. Wild animals abounded, the river Rufiji which borders the station, swarms with Hippopotamus and crocodiles: lions could be heard roaring,—mostly on the opposite bank,—almost every night, while elephant and buffalo did serious damage to the crops and even to the experimental plots. We left in November, doing a fourteen days safari across country to the Central Railway, through some very nice country, and returned to Dar-es-Salaam in December. Here we worked till February at the selections we had made, and arranged for the purchase of a house in Morogoro, where I am now writing, and which is our headquarters; I have a small house, up the side of the Uluguru Mountain, some 40 minutes from the Station, on which I look down, and quite convenient in many ways. I toured in the Northern part of the territory and visited Nairobi, in the neighbouring Colony, of Kenya, in February and March, and at the end of March 1923, went down again to Mpanganya, and saw to the sowing of the selections and generally instructed my assistant as to the treatment and recording of the various experimental plots. You must remember we had no African assistant or clerk, not even a single man who could speak English, so we had to do a great deal of the routine work ourselves. I was fortunate in getting hold of a man who had worked on this place for the Germans, before the war who knew something of laying out plots, and could instruct the gang of small boys and girls we collected for the work of stitching up the cotton flowers. I travelled down the river to the mouth by canoe and got back to Dar-es-Salaam by steamer in the month of June. I came up here to do selection work in this district in the same way as I had done it for the Rufiji District in the previous year. My second Assistant came out that month and was sent off at once to help No. 1 at Mpanganya. The former brought up all his selections here in November and after careful examination, I chose four of them and

sent him to England with them for expert trial and valuation. He was due out again last month but has resigned his post. The second assistant finished up the season at Mpanganya and came up here in December. In January 1924, I went off on a prolonged tour through the North-West of the Territory, up to Lake Victoria Nyanza and across by steamer to Uganda and Kenya, finally getting down to Mombasa, and home by sea after an absence of just two months. I sent off the assistant who had been giving this year's selections a preliminary examination, to Mpanganya, and have taken on the plantation here for the time being, as I am all alone, pending the arrival of a temporary man who will enable me to get away on tour.

The above is a very brief sketch of the way my time has been put in during the past nearly two years. It was just the middle of April, 1922 when I left Coimbatore; as I stopped a few weeks in England, I did not get out here till July 29th. Now, I have been asked by the Director of Agriculture to let you know when I was writing, that he has some posts open to you, of Overseers of Agricultural Stations in this country. I am not sure how many he wants, but the terms he is offering are as follows. The pay is progressive, Shgs. 333-25-500 a month, this means an opening salary of about Rs. 250 a month: free quarters and medical attendance. The engagement would be at first for three years, with the option of re-engagement at the end of that period, when three months leave would be due. This means three months clear in India, as the time spent on the voyage does not count, while during the voyage, I think, half pay is drawn. Second class passage is provided. The Director adds that he would prefer, at any rate as a start, an unmarried man.

The terms seem liberal. Living out here is very cheap compared with India, provided you do not want to use imported things. In some places milk cannot be got, in others only goat's milk. Ghee can always be bought, of fair quality: good jaggery is on sale in most bazaars. Rice, cholam, dholl and gram are commonly grown and are cheaper than in India. Plantains, papaya, mangos are plentiful. Life in a place like Morogoro is civilised; there are two trains a week, and a soda water factory. At Mpanganya it is different. One is sixteen miles from the nearest bazaar. One can get down the river easily in a canoe, though getting up again is harder work. There are, of course, wild animals but they do not, as a rule appear by day, and no danger need be anticipated. Parts of the country are malarious and nets and quinine are a necessity, but other parts are perfectly healthy and as a rule cooler and pleasanter than South India. African servants will cost you about Rs. 10 to Rs. 15 a month. There are, of course, many Indians already in the country. They are mostly Goanese clerks, Bombay traders, or Sikh maistries,

and possibly a Madrassi would not find them very congenial society. Life would on this account be rather lonely, but three years is not very long, and the work would be congenial, while the opportunity for saving is considerable. I shall be very glad to give any further information to any student past or present of the College who will write to me. For details about the conditions of service, application should be made to the Director.

Yours faithfully,
R. CECIL WOOD,
(still) Principal.
A. C. R. I.

[N. B.—This letter without date was received on 6-5-24.—Editor,]

CORRESPONDENCE.

From

M. R. Ry. A. Kondayya Sarma Garu,
Secretary, Gupta Memorial Committee,
Rajahmundry.

To

The Editor,
Madras Agricultural Student's Union Journal,
Lawley Road - P. O., Coimbatore.

Sir,

Please permit me to approach you, with a request to kindly publish the following few lines in your valuable Journal as early as possible.

Gupta Memorial Fund.

A meeting of the officers of the Agricultural Department of the I Circle was held on 23-2-24 at Samalkot and the following resolutions were passed:—

1. The Officers assembled express their deep sorrow for the premature death of the late M. R. Ry. Kantheti Satyanarayana Gupta Garu.
2. Resolved to perpetuate his memory by collecting contributions and utilising the interest thereon in awarding an Annual Prize to the best student of Class II in the Agricultural Middle School, Anakapalli. To achieve this end a Committee consisting of,

1. M. R. Ry. G. Jogiraju Pantulu Garu,
2. " A. Kondayya Sarma Garu, (Secretary)
3. " V. Atchyutarammah Garu,
4. " S. Gurumurti Garu, and
5. " V. Narasimham Garu, (Treasurer)

was formed to start work as early as possible. I request the Departmental officers will kindly subscribe for the above fund.

List of Subscribers.

A. C. Edmonds, Esquire, Rs. 50, M. R. Ry. Y. G. Krishna Rao Naidu Garu 15, „ G. Jogiraju Garu 10, „ S. Sitarama Patrudu Garu 10, „ V. Atchyutaramiah Garu 10, „ N. Sitaramaswami Naidu Garu 10, „ Dy. Director's office, I Circle 10, „ D. Panakala Rao Garu 15, „ N. Ramadoss Pantulu Garu 5, „ P. L. Narasimham Garu 5, „ Peri Lakshminarayana Garu 5, „ A. Kondayya Sarma Garu 5, „ S. Suryanarayana Garu 5, „ V. Butchiraju Garu 5, „ M. Gopal Rao Garu 5, „ M. Ramamurti Garu 5, „ Neelamani Bhukta Garu 5, „ K. Suryanarayana Garu 5, „ B. Madhavarao Patnaik Garu 5, „ T. Lakshmipathirao Garu 5, „ C. V. Sundaram Iyer Avergal 5, „ P. V. Sambasivarao Naidu Garu 5, „ R. Vasudevarao Garu 5, „ D. Suryanarayana Raju Garu 2, „ A. Suryanarayana Raju Garu 2, „ R. Sitaramiah Garu 5, Total Rs. 214/- of which Rs. 179 are paid and Rs. 35 are still due.

Subscribers are requested to send their contributions to the Treasurer Mr. V. Narasimham, Agricultural Department, Cocanada.

(Sd.) A. KONDAYYA SARMA.

DEPARTMENTAL NEWS.

Hebbal Agricultural School. The course of studies in this school will, with effect from July 1st this year, be altered to one of three years, entitling the successful student to a Licentiate'ship in Agriculture. Students will have to pass a preliminary entrance examination and, on arrival at Hebbal, to deposit a sum of Rs. 30/-—Rs. 10/- for possible breakages as caution money and Rs. 20/- for hostel advance.

(*The Hindu*—May 28th 1924.)

Tiruppur Cattle and Pony Show. This year's show was very wisely given up owing to the extreme scarcity of fodder and water which has followed the deplorable failure of rains last season in parts of this district, but the local Agricultural Department arranged during the Car Festival this month for a demonstration in ploughing in the open field opposite the Cattle Fair Grounds, when ryots from over 300 villages witnessed Monsoon and other ploughs at work.

Demonstration Plots:—Government have sanctioned the opening of demonstration plots in Kistna, Chittoor, North Arcot and South Arcot—one in each district. The extent will be 10 acres. On five

acres, improved methods of cultivation will be adopted and the crops will be compared with those raised on the remaining five acres according to the ryot's method; and the landowner will be reimbursed to the extent of the difference between the two systems of cultivation, should the departmental methods result in a loss. The cultivation will be under the immediate direction of a trained maistry. This method of popularising improved methods is a very modest and least expensive attempt compared to the opening of big demonstration farms with wirefencing, roads, and costly buildings and the experiment will be watched with interest.

Agricultural Education. We understand that an Agricultural College and Research Institute will be opened at Mandalay, Burma, in July. There will be two courses, one of two years, and the other, of four years finishing with a diploma. 24 students will be admitted this year and stipends of Rs. 50/- will be given to each student. We trust that the Government of Burma have, in this matter, fully taken into consideration the experience of our College at Coimbatore as regards the trial of similar courses here, since Mr. Carleton, Principal of the Mandalay College visited Coimbatore in February last and must have made a report of our experience to his Government. We wish our sister institution all success.

UNION ACTIVITIES.

The Working Committee at its meeting held on 26th May 1924 decided to hold the College Day and Conference this year in July next, on the 14th and the three following days. A special item of the programme will be the opening of the new Union Building which is nearing completion. It is earnestly requested that contributions promised or intended for the Building Fund may be remitted early in June to save inconvenience to the out-going Committee in closing accounts.

All Members and other gentlemen interested in Agriculture are cordially invited to contribute papers that might be of interest to the Agriculturist.

The Committee begs officer members in the subordinate ranks in Madras and the S. Indian States to send their papers through their superior officers, who have been addressed already with a request to permit their subordinates to contribute.

All papers should be forwarded so as to reach the Secretary Madras Agricultural Students' Union, Lawley Road, P. O., by first July which alone will enable the committee to print the programme for circulation in time.

Vadamalapuram Agricultural Exhibition. Under the auspices of the Tiruthangal Co-operative Society, an Agricultural Exhibition was held in the last week of April at Vadamalapuram in Satur Taluk, Ramnad District and a variety of improved implements, seeds and manures were exhibited. A large number of these were the property of ryots in the neighbourhood. The Disc plough and Black cotton soil plough and the B. S. plough owned and demonstrated by two rich and influential ryots, Messrs Sankaralingam Reddiar and Konda Reddiar respectively, convinced the ryots far better than scores of itinerant officers could have hoped to do. Mr. Sankaralingam Reddiar is reported to have told the ryots assembled how by using the disc plough for removing bariali, he had saved about Rs. 50 to 60 per acre and that they could profit likewise by using that plough. This is certainly an eyeopener to a black soil ryot pestered with that wretched weed. The Thiruthangal Society has been, we are glad to hear, doing very good work by maintaining a Girls' school and attending to the sanitary needs of the village besides its other co-operative work of a very useful nature.

Farm Managers' Conference. All officers in charge of farms and demonstration work are requested to note that suggestions for farm managers' conference at the ensuing College Day and Conference are due at the Central Farm Office before the 25th June, as they are to be submitted to The Director of Agriculture for his approval and orders. They should be sent in immediately.

EDITORIAL NOTES.

His Excellency Viscount Goschen's visit to the College:

His Excellency Viscount Goschen will, we are informed, pay an official visit to the Agricultural College on Thursday the 19th June arriving from Madras that morning. We offer a respectful welcome to him and trust that he will carry with him a pleasing remembrance of the forenoon which he is to spend at the Central Farm and the Cane, Paddy, Cotton and Millets Stations. That His Excellency should have, within the brief space of about two months after his landing in Madras found time to visit some of the centres of activities of the agricultural department,—for His Excellency has already inspected the Nanjanad Potato Farm, the Jam Factory, the Fruit Farm and the Silk Farm at Coonoor—reveals his native sympathy with the profession of the ploughman.

Besides being the centre of the activities of Breeding Work for four of the important crops of the Presidency and of Research Work in various other branches of Agricultural science, Coimbatore is by itself an agricultural centre of great importance since it epitomises the conditions of agriculture of the whole province. It possesses all the chief types of soils to be met with in the Presidency and all the important crops thereof and is in possession moreover of a thrifty and industrious population practising intensive agriculture. And we believe the present visit will enable His Excellency to gather a general idea of South Indian agricultural conditions, though, of course, it is rather unfortunate that the time selected is not very suitable since there will be but few crops on the ground to see.

We understand that His Excellency will at present confine his visit to the cattle yard, the Central Farm, the Sugarcane, Paddy, Cotton and Millets Breeding Stations, the Insectary and the New College building, but we trust that he will graciously pay another visit to the Institution at a not very remote date so as to inspect the various laboratories of the Research Institute and view the students at work during the college sessions.

We are informed that His Excellency will, after finishing his inspection of the Institute, motor to Ootacamund the same day.

Agr. Middle School, Anakapalle.

The Agricultural Middle Schools have been working at Taliparamba and Anakapalle for the last 2 years and this year the Director of Agriculture assumed control of these schools. At Anakapalle the school buildings were completed and were opened on the 15th instant by the Hon'ble M. R. Ry. B. Venkatapathi Raju, M. L. A., amidst a large gathering of well-wishers, ryots, parents of students, officials and townsmen. Excellent arrangements had been made and the programme included the reading of two papers on paddy cultivation and sugarcane by Messrs. C. Jogi Raju and Sitaram Patrudu. The department is, we are sure, thankful to Hon'ble Mr. Raju and other gentlemen who made the function a success. We congratulate Mr. K. T. Alwa, the Dy. Director and Mr. D. Panakal Rao and other members of the staff on the success of the opening ceremony.

Promotions.

We are glad to note that Messrs D. Ananda Rao and Rao Sahib T. S. Venkataraman have been confirmed in the Indian Agricultural

Service, and that Mr. C. Tadalinga Mudaliar has been promoted to it, and that Mr. P. S. Jivanna Rao has been placed on probation in the Madras Agricultural Service in his place. We offer our hearty congratulations to them.

Mr. B. Viswanath, F. I. C.

We are glad to announce that Mr. B. Viswanath, Offg. Government Agricultural Chemist has been admitted a Fellow of the Institute of Chemistry in London (F. I. C.) as a result of examinations held a few months ago. He is one of the few Indian F. I. C's in India and we believe, he is the only Indian Chemist who has qualified in the Agricultural Chemistry Division of the F. I. C. Examination. We offer our sincere congratulations to him.

Letter from Mr. R. C. Wood, Daar - Es - Salam.

We invite the kind attention of our readers to a letter, printed elsewhere in full in this issue, received by us during the month from Mr. R. Cecil Wood who is now Cotton Expert in Tanganyika Territory. Besides giving a brief account of his experience, his interesting letter invites the attention of young men with agricultural qualifications to the conditions of service out there. We trust it will serve to tempt some of our young men to go out and gather such unique experience.

We also invite our readers' attention to a letter published in this issue received from the Secretary of the Gupta Memorial Fund started with the idea of founding a prize at Anakapalle School to commemorate the late Mr. Gupta's memory.

New Appointments.

We are glad to note that in view of the 16 new posts sanctioned by the Legislative Council, many of our new Agricultural graduates as well as some out of the waiting list of Licentiates have been taken into the Department. We trust that the gloom cast over our young men by the policy of retrenchment will thereby be dispelled and we hope better days are in store for our future graduates.

Mr. Noyce, C. S. I.

As we go to Press, we find the list of Birthday honours published and we are very glad to note that Mr. F. Noyce, I. C. S., Secretary to Government, Development Department has been decorated with a C. S. I. Mr. Noyce, besides having served the Government in other capacities, showed conspicuous ability as Secretary of the Indian Sugar Committee and of the Indian Cotton Committee. He richly deserves the honour conferred on him and we beg to convey to him the hearty congratulations of the Union.

Prize Winners, B. SC. (AG.) 1924.

As we go to press we learn that the *Keess Prize* for proficiency in Chemistry and *Robertson Prize* (for aggregate marks) are won by Mr. C. Venkata Sarvayya Chetty, B. SC. (AG.) and the *D'Silva Prize* for Animal Hygiene by Mr. M. Satyanarayana B.A., B.SC. (AG.) and we convey our congratulations to them.

Obituary.

We regret to have to record the death of two of our members Messrs W S. Soans and Satagopa Ayyangar. The late Mr. Soans, passed successfully in the short course in 1922 and was an assistant farm manager at the Coconut Station, Kasaragod, in South Kanara his native district, at the time of his death which was due to an attack of malaria. He was young unobtrusive, gentle and God-fearing. The late Mr. Satagopa Ayyangar was one of the first batch of L. Ag's of this College. He was first attached to the Home Farm, Parlakimidi. He was then Agricultural Instructor at Ramnad and then Farm Manager, Palur and at the time of his death, was Agl. Assistant at the Borstal Institution, Tanjore. His untimely death is much regretted.

DEPARTMENTAL NOTES. (Leave).

Appointments, transfers etc.—

1. Mr. D. Ananda Rao, Dy. Director of Agriculture, on probation, will be confirmed in the Indian Agricultural Service with effect from 10th June 1924.
2. Rao Sahib Mr. T. S. Venkataraman, Government Sugarcane Expert, on probation will be confirmed in the Agricultural Service from 10th June 1924.
3. Mr. C. Tadulinga Mudaliar has been appointed to the Indian Agricultural Service with effect from 3-9-1923 vice Dewan Bahadur K. Rangachariar.
4. Mr. P. S. Jeevanna Rao, to be Assistant Govt. Lecturing and Systematic Botanist on probation from 3-9-23 vice No. 3.
5. Mr. K. S. Ramana Rai, Officiating Upper subordinate, to be on probation with effect from 1-8-24.
6. Mr. T. G. Anantarama Ayyar, do. do.
7. „ M. Chinnaswami Naidu, do. do.
8. „ C. K. Krishnaswami, do. do.

9. " T. Rangabrahma Rao, B. Sc. (A.g) Science Section to work in the I Circle with effect from 1-6-24.

10. Mr. P. Gopalaratnam Sub-Assistant on probation Cotton Section to be Upper Subordinate Agl. Section on probation, but to continue to work under Cotton Specialist.

11. Mr. N. Sitharamaswami Naidu, Lower Subordinate III grade to be Upper Subordinate, V grade, Agricultural Section, on probation, to continue in the first Circle.

12. Mr. R. Kesavanurani Nambiyar L. Ag. to be on probation, Upper Subordinate V grade to report to VII Circle.

13. " K. K. Subrahmanya Ayyar, L. Ag. do. do. VIII "

14. " M. Eggiawami, L. Ag. do. do. IV "

15. " C. Venkatasaravayya, B. Sc. (Ag.) do. do. Government Economic Botanist.

16. " K. B. Viswanatham, B. Sc. (Ag.) do. do. Supdt., Central Farm.

17. " M. B. Venkatanarasinga Rao, B. Sc. (Ag.) do. do. Government Economic Botanist.

18. " M. K. Swaminathan, L. Ag. do. do. Dy. Director of Agriculture IV Circle, St. Thomas Mount.

19. " V. Thirumal Rao, B. Sc. Ag. do. do. Government Entomologist, Coimbatore.

20. " P. Narayanan Nair, B. Sc. (Ag.) to be officiating, Upper Subordinate, V grade to report to Cotton Specialist.

21. " Gomati Nayagam Pillai, B. Sc. (Ag.) do. do. to Millets Specialist

22. " A. Krishnaswami, (L. Ag.) do. do. Dy. Dir., III Circle.

23. " R. Govindaramayya, (L. Ag.) do. do. do. V "

In the above appointment order six Upper Subordinates of the Agricultural Section have been temporarily deputed to work in the Science Section.

24. Mr. M. R. Balakrishnan B. A., B. Sc. (Ag). to officiate as Upper Subordinate, V grade, Science Section, to report to the Govt. Agricultural Chemist, vice Rangabrahma Rao.

25. Mr. S. Varadarajulu Naidu, to be on probation as Lower subordinate V grade to report to the Dy. Director of Agr. III Circle [Mr. C. Chenchayya's appointment as lower subordinate is cancelled.]

26. Mr. P. K. Kannan Nambiyar, to be on probation as Lower Subordinate V grade to report to Seventh Circle.

27. Mr. M. Ratnavelu, to be on probation as Lower subordinate V grade, to report to the Government Lecturing Botanist.

28. Mr. M. Raghavulu Nayudu, on relief by Mr. K. Narayanayangar, to continue his Ongole Cattle Survey in the Guntur District.

29. Mr. K. T. Bhandary, Teaching Assistant, to be Farm Manager, Palur.

Retirement.—

1. Mr. F. R. Parnell, Government Economic Botanist, permitted to retire from the Indian Agricultural Service from the date of expiry of the leave granted to him on 21st February 1924.

Leave.—

1. Mr. P. H. Rama Reddi, Dy. Director of Agriculture, III Circle, leave on average pay for one month from or after 7th May 1924.

2. Mr. P. Venkataramayya, Assist. Lecturing Chemist, leave on average pay for one month from 12th May 1924.

3. Mr. T. V. Subrahmanyayyar, Asst. to the Entomologist, leave on average pay for two months from or after 1st May 1924.

4. Mr. U. Vittal Rao, Assistant, Govt. Sugarcane Expert's office, leave on average pay for one month from 15-5-24.

5. Mr. P. N. Krishnan, Asst., to the Entomologist, leave on average pay for 28 days from 19-5-24.

6. Mr. S. Jobitharaj, Assistant to the Govt. Economic Botanist, leave on average pay from 19-5-24 to 4-6-24.

7. Mr. S. Dharmalinga Mudaliar, do. do. do. do. leave on average pay from 20-5-24 to 14-6-24.

8. Mr. P. Vishnusomayajulu, Assistant to the Govt. Mycologist, leave on average pay for six weeks from or after 26-5-24.

9. Mr. K. W. Chakrapani Marar, Farm Manager, leave on average pay for one month from or after 15-5-24.
10. Mr. K. Rama Rao, Farm Manager leave on average pay for one month from 23-4-24.
11. Mr. L. Narasimhachari, Farm Manager, leave on average pay for 15 days from 16-5-24.
12. Mr. N. Narayanayyar, Assistant Farm Manager, leave on average pay for three weeks from 4-6-24.
13. Mr. G. R. Venkatachalapathy, Assistant Farm Manager, leave on average pay for three weeks from 4-6-24.
14. Mr. T. V. Srinivasachari, Assistant Dairy Manager, leave on average pay for a fortnight from 1-5-24.
15. Mr. P. Nagadhara Naidu, Asst. Agricultural Demonstrator, leave on average pay for one month from 1-5-24.
16. Mr. E. K. Govindan Nambiyar, Agricultural Demonstrator, leave on average pay from 12-4-24 to 1-5-24, the unexpired portion having been cancelled.
18. Mr. K. Srinivasacharya, Agricultural Demonstrator, leave on average pay for 10 days from the date of availing.
19. Mr. V. T. Subbiah Mudaliar, Agricultural Demonstrator, leave on medical certificate from 16-5-24 to 15-6-24.
20. Mr. K. Vasudeva Shenai, Assistant Agricultural Demonstrator, leave on average pay on medical certificate from 20-4-24 to 3-5-24.
21. Mr. C. A. S. Ramalingam Pillai, Assistant Farm Manager, extension of leave on medical certificate for one month.
22. Mr. M. Krishnasawmi Ayyangar, Assistant Farm Manager, leave on average pay for 15 days from 2-4-24 with permission to suffix the Easter Holidays.
23. Mr. V. V. S. Varadarajan, Assistant Agricultural Demonstrator, extension of leave by one month on medical certificate.
24. Mr. K. Balaji Rao, Asst. Agricultural Demonstrator, leave on average pay for 20 days from 1-5-24.
25. Mr. D. Ananda Rao B. Sc. (Edin) Deputy Director IV circle leave on average pay for one month from 1st June 1924.
26. Mr. A. Ramalinga Ayyar, Assistant Agricultural Demonstrator Tirumangalam, leave on average pay for 1 month from 3rd June 1924.
27. Mr. M. Krishnasami Ayyangar, Assistant Farm Manager, Hagari leave on average pay for 15 days from or about 2nd June 1924.
28. Mr. K. Rama Rao L. Ag. unexpired portion of 5 days out of one month's leave granted, cancelled.

AMENDMENTS AND ALTERATIONS.

I.

Notice is given of the following alteration of Rule No. 13 (printed elsewhere in this issue).

Rule 13. The Editorial Board.—Seven Members shall constitute the Editorial Board to conduct the Journal. Of the seven members, three should be members of the Working Committee viz., the Editor, the Sub-Editor, and the Manager, and the remaining four shall be elected at the General Body Meeting from a panel of 10 names suggested by the out-going Working Committee and notified by the President on the Business Meeting Day before the proceedings commence.

Proposer.—M. R. Ry. Rao Saheb Y. Ramachandra Rao.

Seconder.— „ T. V. Rajagopalachari.

II.

We give notice of the following resolution for discussion at the Business Meeting of the Union to be held at the time of the next College-Day.

(1) "That this General Body is of opinion that the subordinates of the Agr. Dept., in the several Durbars, with qualifications similar to those in British provinces, should have the same scales of pay and prospects, and prays that the Govts., of their Highnesses may be graciously pleased to consider this matter as of urgent importance and pass favourable orders."

(2) "That the Working Committee be authorised to forward the resolution to the various Durbars concerned and place themselves in communication with them."

Proposed by, V. Muthuswami Iyer.

Seconded by, M. U. Vellodi.

The Rules of

The Madras Agricultural Students' Union, Coimbatore.

FOUNDED IN 1910.

(Revised at the General Body Meeting held on 17th July, 1923.)

1. *Name of the Association and its Headquarters*.—The Association shall be called "The Madras Agricultural Students' Union" with headquarters at the Agricultural College, Lawley Road, P.O., Coimbatore District, and code word shall be 'Union'.

2. *Objects*.—The objects of the Union shall be:

- (i) to encourage an *esprit de corps* among its members.
- (ii) to exchange opinions and experiences in matters agricultural and to make a record of the same.
- (iii) to act as far as possible as a bureau for procuring employment to members of the Union,
- and (iv) to protect and promote the interests of members.

3. *Objects: how attained*.—The above objects shall be attained by:—

(i) The Annual celebration of a College Day. The date for the celebration shall ordinarily be the 14th July, which is the date on which the Coimbatore College was opened by his Excellency, the Governor of Madras, in 1909.

(ii) The holding of a conference in continuation of the College Day at which papers will be read and discussions held on Agricultural subjects.

(iii) The maintenance of a corrected list of addresses of all members of the Union,

and (iv) the conducting of a Journal as an organ of the Union primarily to cater for members of the Union, but also to contain information of general agricultural interest.

4. *Membership: eligibility*:—The following shall be eligible for membership:—

(a) *Student members*:—

(i) The students of the late Madras College of Agriculture, Saidapet.

(ii) The past students of the Agricultural College, Coimbatore.

(iii) The present students of the Agricultural College, Coimbatore.

(b) *Officer members*:—

(iv) The officers, past and present, of the Agricultural Department.

5. Every member shall on joining pay an entrance fee of Rupee one and an annual subscription according to the sliding scale below:—

Students under training	...	...	Rs. 2.
Members with an income up to Rs. 100 per mensem	...	...	Rs. 3.
Members with an income of Rs. 100 and above up to Rs. 250 per mensem	...	...	Rs. 4.
Members with monthly incomes of Rs. 250 and above	...	...	Rs. 5.

6. Every member shall be entitled for a free supply of one copy of the Journal.

7. *Patrons*:—Gentlemen who are interested in the welfare of the Union and contribute a sum of not less than Rs. 100 to the Permanent Fund of the Union shall be styled Patrons.

8. *Honorary Members*:—Gentlemen interested in the welfare of the Union may be invited by the Council to become Honorary Members. Donations will be thankfully received from them.

9. *Associates*:—Gentleman interested in Agriculture may be admitted as associates on payment of an annual subscription of Rupees Five.

10. *The Council*:—The affairs of the Union shall be managed by a council consisting of a President who shall be the Principal, ex-officio, and four Vice-Presidents and 20 Members, of whom one Vice-President and 10 members shall be resident members. From amongst the last, the General Secretary, the Treasurer and the Editor shall be elected.

11. *Election of Council*:—All members of Council shall be elected at the General Meeting on the occasion of the College Day. The resident Vice-President and the 10 resident members of Council including the General Secretary, the Treasurer and the Editor shall be elected by all the members of the Union including student members. The mofussil members of the Union including the mofussil Vice-Presidents shall be elected by all members excepting the present students, the votes of mofussil members being also obtained.

12. *The Working Committee*:—The resident Vice-President and 10 resident members of the Council shall form the Working Committee with as many student members as there are classes, elected by the student members. The Working Committee so formed shall appoint an Assistant Secretary from the student members of the Committee and a Sub-Editor and a Manager from among the rest.

13. *Journal*:—The conduct of the Journal shall be in the hands of an Editorial Board of 7 members consisting of Editor and Publisher, Sub-Editor, Manager and four other members.

One copy of the Journal will be given free to Patrons, associates and members other than Honorary members and an annual subscription of Rs. 4 shall be collected as the subscription for the Journal from all others.

14. *Vacancies*:—Vacancies occurring in the Committee in the interval may be filled by the Committee.

15. All proposals of amendments to the rules shall be communicated to the General Secretary before the 31st of May

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Coimbatore Manurial Works,
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Standard Saltpetre Refinery,
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17. (1) There shall be a Reserve Fund which shall consist of donations from Honorary Members and Patrons, entrance fees and such other amounts from previous balances as may be transferred at the Annual meeting and this Fund shall be utilised to meet such charges as may be decided on at the General Body Meeting.

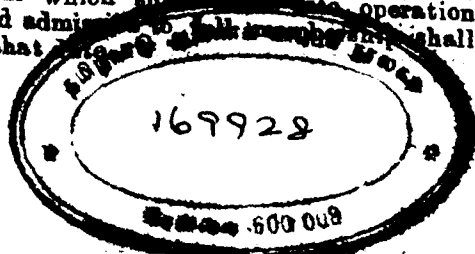
(2) For general expenditure the budget of the following year shall be passed by the General Body, the draft budget being published in the issue of the Journal missing the one immediately preceding the College Day.

(3) The Working Committee of the Union shall arrange to invest the several Funds of the Union in fixed or current deposits in suitable banks.

(4) The accounts of the Union shall be audited by two members of the Union who are not members of the Working Committee and the financial statement together with the balance sheet under each head as they stand on 31st May every year, shall form an essential feature of the Annual Report, the Auditors for the purpose being selected by the General Body.

Transitory Rules:—(1) Members, benefactors and associates admitted prior to 17-7-23 will exercise all rights and privileges under the old rules, but may be allowed to come under the new rules provided no concession is claimed for their paid-up subscriptions for the membership in whole or in part.

(2) The revised rules shall come into force from 17th July 1923 for all purposes except in the case of Membership and subscription to the Journal which shall continue in operation from 1st January 1924 and administration of the Journal shall be kept in abeyance till that date.



(vi)

Groundnut Decorticator,

நிலகடலைத் தோல் உடைக்கும் இயந்திரம்.



or Opener Worked by Engine power. The machines are of three types—A, B, C and their working capacity is 80, 100, 120 bags of seed in 12 hours respectively. Write for illustrated pamphlet.

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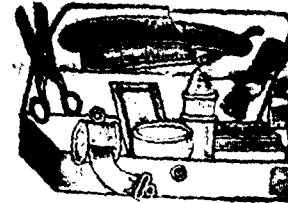
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(vii)

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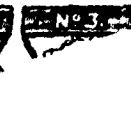
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