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

The Madras Agricultural Journal.

(ORGAN OF THE M. A. S. UNION).

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EDITORIAL.

Importance of Fruits.—Madras is notorious for absence of adequate quantities or kinds of fruits which dieticians say are essential for the development and health of the human frame. The mango, the banana, the jack are perhaps the only ones known in most parts of the Presidency. Even these are not available nor are used on an adequate scale nor do they form part of the *menu* of an average man. This defect in a man's food has not however been unknown to people of this province but few seem to have taken any serious steps to introduce fruits of different kinds and what attempts have been made have been confined to a few negligible centres. True it is, western fruits have been introduced and successfully too on the hills and the Government gardens on the Nilgiris do certainly supply the needs of persons who have developed a taste for these, yet their scope is limited and on the plains, there are no fruit gardens nor a very general distribution of assortment of fruit trees. This is perhaps due to want of patronage on the part of big landed interests and it

is unfortunate that the general public have not developed a taste for the use of fruits as a part of the dietary. There is any amount of land available and different localities would certainly be found suitable for different kinds of fruits and it needs a general awakening on the part of rich men to create a demand and thus familiarise the cultivation of fruit trees and use of fruits. Would medical men take up this question and rouse the Madrassee to this serious defect—it is then time for the agriculturists to step in and grow fruit trees suited to their localities—or will both combine and make joint efforts in removing this national defect? This will not add to extra expenditure on a farm nor reduce the income. By no means will it bring about a reduction in the area of food crops. Will anyone amongst the leisured agricultural classes prove the pioneer and lead the way?

The Nightmare of Assessments. In this country all lands are assessed to a greater or less extent. In pre-British days, the system in vogue seems to have been pretty elastic though opinions differ whether they were not unduly heavy. The theory of assessment has for its basis the question of rent but various men—whether officials or no officials but all distinguished in their own way—have interpreted according to their own lights and the controversy over the resettlement and its duration has raged very bitterly almost in every province, politicians mostly favouring *status quo* or slight advance while executive officers have ranged themselves on the other side. Until the intricacies of the problem and a full knowledge of the processes of farming combined with a reliable and unimpeachable record of the advance or retrogression are available, it is natural that both sides may err to a large extent. The question of adjustment of assessment is not a matter entirely between the cultivator and the Government. Innumerable other persons exercise an indirect influence and in the discussions of solutions of such problems, a judicial exercise of judgment is necessary. Fundamentals having been first agreed upon in unmistakable terms, it is easy to arrive at a reasonable figure. It was Lord Morley who, we believe, once said that the world is not governed by wisdom but by sentiment. And in financial considerations mere

logic alone will not gain one's point, an element of human sympathy or sentiment should be introduced at any rate not be banished altogether. We are led to make this comment by a perusal of Mr. Anderson's "Facts and Fallacies of the Bombay Land Revenue System." We admire the author for his merciless and trenchant logic but have poor praise for his reading of the agricultural situation that exists in Bombay, perhaps also to an equal or greater extent in a few other provinces. We certainly endorse his opinion that other members of the community should understand how the cultivator is wrong in supposing that he can claim greater wages for less work but we cannot say whether a real understanding between the cultivator and others will always give the results anticipated for the ryot. Now that Mr. Anderson has retired and is free we hope he will use all his influence with the public and help at a practical solution of this vexed Indian question.

Cattle Breeding.—During the short period of ten years that the Live-Stock section of the agricultural department has been in existence in Madras tremendous and laudable efforts have been made in the direction of improving local breeds or introducing better breeds. One very tangible effect seems to be the increase in milk-yield of animals stationed on Government farms which influence is bound to be felt at least in the immediate neighbourhood in the course of a few years. Maintenance of stud bulls in different centres is also making its influence felt but in a province all dependent on agriculture and cattle where owing to the peculiar local conditions adoption of large scale agricultural machinery is well nigh difficult of attainment, improvement of local animals, whatever their character be, is absolutely necessary on a mass scale. We do not know whether the majority of agriculturists know the seriousness of the situation and whether concentration of attention on the study of excellences and defects of local cattle in different tracts irrespective of the introduction of superior breeds is not also equally necessary simultaneously. A cattle survey on these lines has been made for the Ongole and adjoining tracts and is we expect in contemplation for other tracts also as funds permit but we venture to submit

that such surveys may extend over very long periods before the whole Presidency is completed, will be productive of doubtful results and leaven any recommendations that may be made at the end with uncertainty as being out of date. The department cannot of course help it and funds are needed on a pretty large scale and it is for the legislators to provide them with due discrimination.

Daily Press and Agricultural Journalism.—The growth of the Press and the power it wields for good or ill has been the subject of comment on various platforms and in the Press. The Press educates the public who are eager for news, reflects their opinion and often leads them onward in critical situations. In the daily press one finds and does not get disgusted with items of news as varied as the 'breach of a rivulet in Pernambuco' the escape of an under trial prisoner, the change of his furcoat by an aristocrat in Tobolsk, the running over of a buffalo by a passenger train at Kimidi, G. B. S's lectures on decency, the heated controversy in the Legislative Assembly—all these are read with jest and quietly passed on, though most of these are put in to make up space but such things will look queer and perhaps fantastic in technical journals. These therefore have to confine their attention solely to matters which are within their legitimate purview which is limited. The extraction of fuel power from water by an Engineer from La Plata may perhaps interest an electrician but excites derision in a reader of agricultural journal, because mostly he wishes something new, something which is of local application. Herein lies perhaps the strength and weakness of agricultural journalism. It has to steer clear of a repetition of unfounded popular beliefs and easily controverted rumours as well as high technicalities which are the *sine quanon* for the progress of science. In the United States and countries similarly situated which have been recently populated, the farmers have no hoary tradition to lean upon, have vast tracts of land to deal with, immense resources to profit by, and can take or give up a new crop, implement or method when each fails and yet succeed in farming. Being mostly new to farming, they seize with avidity any fresh piece of news broadcasted by agricultural journals. These also thrive in turn, a few running over

two millions in circulation. Further, research stations are dotted over the whole country where hundreds of workers are every day tackling problems of great magnitude and notifying the results to be confirmed or contradicted by fellow workers and adopted or discarded by farmers as they choose. This advantage is denied to countries where research work is confined to a few workers and which enjoy conditions dissimilar in very many respects. Thus the agricultural journalist in an old country suffers from handicaps which his brother elsewhere is free from and he has to exercise great caution in picking or rejecting items which a daily pressman or agricultural journalist elsewhere need not in the least worry about. This is one reason why agricultural journalism can only be of very slow growth in a country like India and it is appreciation of this aspect on the part of the public that can help its development and progress though they may not be actually conscious about it.

M. A. S. Union Rules. The working committee have had under contemplation the entire revision of the rules so as to meet the increasing needs of the Union. They were last revised in 1923 and one or two amendments have been brought up in the interval and passed. The conditions of old membership and of the new which was unmistakably put down in 1923 have created a situation in which the future of the journal and the satisfactory working of the Union need clear emphasis. Further, rules now in force have been a good deal elastic, and in some instances defective. These are sought to be remedied by a revision of them. The committee are working at it and it is hoped they will be duly published in good time before the next annual business meeting.

A Scheme of Rural Education and Reconstruction.

BY K. UNNIKRISHNA MENON,

Assistant Director of Agriculture, VII Circle, Tellicherry.

The villagers are mostly farmers of insufficient means. Before starting any work to improve the lot of the farmer one has to study the essential points of his psychology. Every one will admit that any scheme of work meant to improve the farmer must remain attractive to him. It must be attractive almost at the very outset. It is also true that nothing except an immediate money profit will serve to be the most attractive feature of any scheme. He is not sufficiently patient to wait long to obtain it; nor is he always cultured enough to study a situation so thoroughly as to satisfy himself that he has to hold on, spending something upon it, so as to reap increased profits later. He is not also prepared to leave his village for even a couple of days to study profitable ways from elsewhere and to adopt them. He is almost always working under the firm belief that his ways are the best and people coming from elsewhere can therefore render him little help in his own line of work, except when the new-comer is prepared to give him a loan to finance his own cultivation in his own ways. He is also of very strong opinion that any change in his farming methods will bring him loss. He is fatalistic enough, to believe that any loss sustained in his usual business is almost always due to bad season. He is seldomable to assimilate theories and even facts lectured to him or published in leaflets. Therefore the scheme of work with him must necessarily be one in the field in his own village bringing him increased profits in his own rupees annas and pies. Any profits made in a Government Farm run at Government expense or in a farm of a rich land-owner do seldom serve to appeal to his senses as realities.

With these points in view and a guarantee of funds for what may appear to him a risk even in fair seasons, it is possible to start work with one or more farmers in any locality. When increased profits are proved to him in his own lands under his own control by following the advice of an agricultural expert, many a farmer is made a faithful adherent and admirer of the agriculturist whom he begins to follow as a useful guide in all his affairs.

Therefore the question resolves into one of evolving a scheme of work in the field in collaboration with a typical average farmer of popularity in a village. The first consideration for such a scheme is to find out the essential factors which increase the profits of a farm. To be brief I shall put them as:—(1) Efficient and complete use of labour, (2) Selection of profitable crops and live-stock, (3) proper use of cropping practices and proper care of live-stock, (4) knowledge of the cost of production and selling prices showing a margin of profit always, (5) turning all the by-products into money and (6) preventing all lines of waste of time, labour, capital and land.

With these profit factors in view the Agriculturist has to consider which all of them can be adopted in the particular case he has to deal with. The individual farmer with whom the agriculturist has to collaborate and the piece of land in which he undertakes to prove the efficacy of the improved methods to bring in better profits, must be both selected in a suitable locality with great care. A farmer so selected must adopt all improvements for any loss. The agriculturist must also dictate improvements gradually so that a thorough reorganisation of labour and cropping arrangement of the farmer has not to be at once effected. Probably in a few cases the farmer will have to be financed for all the additional expenditure, if any, involved on account of the new method followed. Some common good funds of a co-operative society or the state will have to finance these things to commence with and the agricultural expert will have to supervise the progress of work in every detail. He must be sure to bring about a higher net profit. Any extra expenditure must be deducted from the profits and the net amount should go to the farmer who must have made use of his labour and cattle on this land as on his other areas under cultivation.

If one or two farmers have been for one year made to carry on the work with annual crops meant to produce quick results under the strict supervision of the agricultural expert the profits they must make will certainly be the subject of frequent talk among the villagers. As a consequence more farmers are sure to come forward and

volunteer to adopt such new ideas in their farming without any guarantee of funds to compensate losses. Thus, before long an association of farmers adopting new methods can be formed under the guidance of the expert.

Once it becomes possible to form an association of this type for which the necessity arose from within the village, it happens to be a strong centre of work because the membership thereof could be claimed by people who secured faith in the practical aspect of improvements. They will always remain more agreeable to adopt new ideas. Thus an organisation of the type can be made to serve more purposes than the one originally outlined and work without a local organisation is not effective and lasting. Therefore it becomes in reality a co-operative society of farmers run under the guidance of the agricultural expert. Thus it can with little of conflicting interests work as an unlimited liability society to finance the members for their farming and other requirements. It can serve as the most effective centre to impart useful knowledge about anything the villagers require. This should be the end and aim of all rural educational institutions. Thus a strong desire to read and understand things will gradually and automatically be created in the mind of the villager and he will be glad to attend night-schools himself and to send his children to day-schools. Village reading rooms and libraries will soon rise up as side activities of such farmers associations. Their outlook will be widened as they begin to communicate with one another and a central association which they will find it necessary to form sooner than any can imagine. Therefore through the intervention of the agricultural expert who becomes the central figure of any such association all items of work like adult education, rural education, village sanitation, veterinary and health works, etc. can be introduced into a village with greater ease. At present many of the new ideas become as it were an infliction upon the villager who, generally, is at a loss to see how they are so essential to his well-being.

In America also such organisations were started by the agricultural extension service with success. The work of the independent departments of co-operation, education,

veterinary, etc. were combined with this agricultural extension service work to be the sole agency to deal with the rural problems. To quote the words of Mrs. Howard the President of the Agricultural Section of the Science Congress this year, "If the cultivator is to be made a willing partner in the new scheme he will have to be handled from the outset by men who are in sympathy with him, who understand his point of view, who speak his language, wear his dress and who can live in his village." The present agricultural expert (the Agricultural Demonstrator) is therefore the one man who fits in properly as the rural worker to start such associations and work such schemes. He can later on train village school-masters and educate energetic members of the associations to carry on the increasing work of each association serving it as a Secretary. If the worker happens to be a village school-master he is sure to give a good rural development bias to the system of education to the young. The agricultural expert can himself assist such work in a few suitable schools. The workers might be given a small honorarium from State aid to commence with, and later from the funds of the associations.

"Some facts of Importance to Paddy-Growers"

BY K. VENKATARAMAN, M. A.

Assistant Paddy Specialist, Aduturai.

1. *The maintenance of seed-purity in paddy strains.*—The Paddy breeding station, Aduturai was started in 1922 and the selection-work on paddy that had previously been commenced at the old Manganallur Agricultural Farm, was continued at this station. As a result of several years of arduous work nine improved strains of paddy have been evolved and seed of these pure strains distributed to ryots in the Cauvery delta to be grown in place of the inferior, mixed, local seed. These Aduturai strains of paddy have proved very popular and the demand for seed is far in excess of the possible supply. Ryots who have grown these strains have appreciated their qualities of even heading, uniform ripening, and high yield. These good qualities shown by the crops raised from improved strains will be kept up only so long as the seed is kept pure and free from admixture of any kind. If care be not taken to keep the seed pure, the crop deteriorates and the yield diminishes in proportion to the degree of contamination in the seed. It is therefore very essential that precautions should be taken by every ryot for keeping the seed pure.

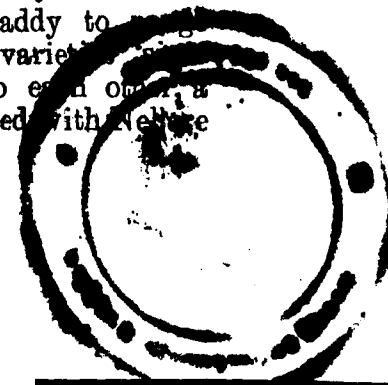
There are four stages at which seed is likely to get contaminated, to wit, the seed-bed, the planted-field, the threshing floor, and storage receptacles.

'Seed-bed'.—The nursery fields often contain stray seeds fallen from the last harvested crop. Such seeds should be sprouted and removed, so that they may not get mixed up with the pure seed to be sown. For doing this, the nurseries should be ploughed and water let in for 3 or 4 days and sufficient time allowed for all the seeds lying in the field to sprout up. It is uneconomical to hand pick and remove the sprouted seedlings. When all the seeds have sprouted which will be in about a week after the letting in of water, a thorough ploughing will uproot all the sprouted seedlings, and they will gradually rot. The seed beds should then be finally prepared and pure seed sown.

This can be practised in all 'samba nurseries' in the Tanjore delta, since wet nurseries only are adopted for samba crops. However in the case of dry nurseries for kuruvai crop, this precaution is not practicable and the other precautions detailed below should be taken to ensure purity.

Planted fields — The fields in which seedlings are to be transplanted also contain dormant paddy seeds fallen from the previous harvest. It is essential that these residual grains in the field should be sprouted and removed before the field is got ready for planting. This object is easily achieved by letting water into the field after the first ploughing, and keeping the field wet for a week. The residual seeds in the field would have sprouted well by that time, and the subsequent ploughing would uproot and destroy them. The fields should then be got ready for transplanting. The flowering-time of the crop is another stage at which plants belonging to other varieties can be easily spotted out and removed. This operation is called roguing. When the crop has fully flowered the very early and late plants in the field should be pulled out and removed. Other plants which look dissimilar to the general type in height, colour or habit, should also be removed. It is not necessary that this 'roguing' should be done in all the cultivated fields. It is quite sufficient to confine this operation to a small area, the harvested grain from which will provide adequate stock of seed for the next season's sowing. For example, if a ryot is cultivating 20 acres of land with a particular variety of paddy, if roguing should be done only in one field about a 'mah' 1/3rd of an acre in extent, he will have enough pure seed for the next sowing.

Lurking rogues.—It is a common practice for some ryots to grow different varieties of paddy in very closely adjacent fields or even in portions of the same field. Whenever two crops, 'sirumani' and 'Nellore samba' for instance, are grown in adjacent positions, a certain amount of 'natural crossing' takes place in the rows of the two crops that are in close proximity to each other. This amount of 'natural crossing' has been estimated in paddy to range from 1.4 to 2.9 per cent. If in the two varieties 'sirumani' and 'Nellore samba' grown close to each other, a spikelet of a sirumani plant should get crossed with Nellore



samba, the resultant grain could not be distinguished from other sirumani grains. The crossed 'sirumani' grain would in the succeeding crop produce a sirumani plant with sirumani-like grains. This is so because 'sirumani' size of grain is dominant to Nellore samba size of grain. Here then is a lurking rogue, a plant so like the true type, but none the less a rogue! The lurking rogue naturally escapes observation and in the next crop produces to the surprise of the ryot, some plants of Nellore samba type and some plants of sirumani type! How then is the ryot to get rid of the lurking rogues that elude the chase. The remedy is very simple, and consists of eliminating the border-crop from the sheaves that are meant to be threshed for seed-paddy.

Threshing floors.—The ordinary ryots' threshing floor is a great source of contamination. Sometimes a common threshing floor is used by several land holders, and often different varieties are threshed on the same threshing floor without any attention being paid to cleanliness. It is not certainly necessary to have costly brick or granite threshing floors, but with the exercise of sufficient care, even the ryots' ordinary threshing floor can be made to serve quite as well. In threshing sheaves, the grain from which is to be used for seed purposes, great care should be taken to sweep the threshing floor free of all stray paddy grains, and the sheaves should be threshed right in the middle of the cleanly-swept space. The grains that get scattered all round the threshing-floor should not be gathered up for seed-purposes. If the seed taken from such carefully-threshed sheaves is kept for sowing the next season, purity of seed will be ensured. Here again, all this care and vigilance need be confined only to threshing small lots, the grain yield of which is to form the seed-stock for the next season.

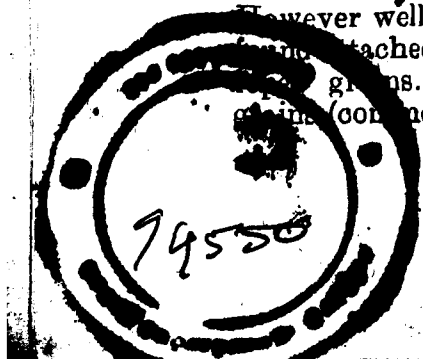
Storage receptacles.—Very commonly seed-paddy is stored by ryots in straw-twists (kottais) or in gunny bags. These straw twists are dangerous envelopes for seed-paddy. However well straw may be threshed, there will still be grains attached to the panicle portions of ill-filled and undeveloped grains. These half-filled and ill-developed paddy grains (commonly known as karukkai) sticking on to the

straw have been found to germinate quite well and grow. Since threshed straw from different varieties of paddy is all usually stacked in the same heap, one can easily imagine what happens when sirumani paddy seeds should be wrapped up in Nellore samba straw-twists. Herein lies the danger of using straw-twists for preserving seed-paddy. If straw-twists cannot be altogether dispensed with for storage the obviously safest course would lie in using the straw of the same variety for each kind of paddy seeds, after making sure that straw of the wrong type has not crept in.

Gunnies again, are receptacles that have to be used with great vigilance. When a gunny is used for storing seed-paddy, it should be turned inside out and the corners and chinks examined carefully for stray grains sticking to the sides. A stray grain of another variety lurking in a corner of the gunny is enough to vitiate seed-purity if left undetected.

Lastly, seed-paddy should be dried occasionally during storage in order to keep off mouldiness, etc., and it is very necessary to exercise the strictest supervision during drying so that a few seeds of one variety do not get mixed inadvertently with seeds of another variety.

2. Turning to good account leaf and waste organic matter.—The application of dressings of green leaf as a fertiliser for paddy is recognised by every paddy cultivator. Green leaf is scarce in deltaic tracts, and there is a keen scramble for leaf as soon as freshes in the river arrive and cultivation operations have to be begun. All available green leaf by the side of river banks, channel courses etc. is then hurriedly gathered up and applied to nurseries and fields, but the supply proves very inadequate. If, however, during the rainy season, when hedge prunings, weeds and other organic matter are available in large quantities, should be turned to good account by being composted in pits together with a sprinkling of water-suspension of cattle-dung and bonemeal, a supply of synthetic Farm Yard Manure would have been put by, for use during the ensuing season. Such pits which are used for making Synthetic Farm Yard Manure should be protected from the sun and



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rain. If all organic waste matter, such as weeds, green leaves, dry leaves etc. should be carefully utilised for making manure, the manurial problem would be rendered a little easier of solution.

3. *Prevention of crab-damage in paddy fields, and turning dead crabs to manurial account.*—Crabs cause damage to paddy crops in several ways. They nibble sprouting seedlings in the nurseries and also cut across newly planted seedlings in fields. The former mischief results in a dearth of seedlings in seed-beds, while the latter renders it necessary to fill up gaps caused by the destruction of plants. This annoyance is most felt in thin-sown nurseries and economically planted fields. The crabs also make holes through the bunds of fields and a field may get completely drained through these holes at a time when water is most needed by the crop.

A simple method of preventing crab-damage has been adopted at the Paddy breeding station, Aduturai with highly successful results. The device is inexpensive and self acting. A wide mouthed ordinary mud-pot (chattie) is buried in a corner of the paddy so that the mouth of the pot is just flush with the level of the soil in the field. The pot is baited with two handfuls of raw rice bran, moistened, and made into large lumps for convenience in handling. If the whole field is under water, the pot also will naturally get filled with water. This, however, will not wash out the bran in the pot as wet-bran quickly settles to its bottom. The smell of the rice bran attracts the crabs which drop into the pot and are held captive there, the sloping convex neck of the pot effectively preventing all means of escape. The bait, to wit, raw rice bran, may be renewed every alternate day. Usually five crab traps should be placed in each acre field, one near the inlet, one near the outlet, one at the centre, and two at the corners. Since channel courses act as the courses of supply these traps may be put down in beds of channels as well. The irrigator who usually looks after the irrigation and drainage of fields may be entrusted with the looking after and baiting of these crab-traps. The crabs which fall into the pots should be cleared every day, otherwise they die

by drowning after twenty four hours, and the dead bodies start decomposing. The crabs cleared from the pots every day should be killed and thrown into pits, and a layer of earth strewn well over to prevent birds of prey being attracted. This process is repeated every day and when the pits are full, the rotted crab-manure can be dug out and applied to fields. At the Paddy Breeding station, Aduturai a systematic campaign against crabs resulted in the production of over 20 cartloads of manure during one season from the daily catches of crabs in crab pots. Such crab manure when tried in a field scale against an equal bulk of local cattle manure proved to be of high fertilising value. Using a crop of Aduturai No. 1 (Red sirumani) crab manure and village-cattle manure were turned in at the rate of 300 lb. per cent, and the results showed that crop reared on crab manure yielded 11 per cent more grain and 37 percent more straw. The manurial value of dead crabs enhances the usefulness of crab traps, firstly as a preventive measure against damage, and secondly as a beneficial fertiliser for the crop,—a case of "pressing the enemy into service".

**Welcome Address by the Director of Agriculture,
Madras*.**

Mr. R. D. Anstead, Director of Agriculture, in welcoming the delegates, spoke of the importance of having such Conferences and of the benefits derived from them. The departmental officers and the mirasdars by meeting on a common platform had an opportunity of discussing their local problems which could be solved in a friendly and unofficial way which he felt was an enormous advantage. The main object of the paddy station was to produce new and better strains of paddy and since the station was opened they had been able to evolve 9 kinds of strains. The department was at present engaged in trying to make strains which would be resistant to the paddy blast and he hoped that their efforts would be crowned with success.

The multiplication of seeds was not a departmental job at all, but was one that ought to be taken up by private individuals and co-operative societies. Though the department had been making strenuous efforts to do something in this direction, the mirasdars should come forward to play their part; otherwise this problem could not be solved. He did not agree with the mirasdars when they stated that the department should take up a seed multiplication farm.

Dealing with agricultural and manurial problems, Mr. Anstead said that the department was beginning to tackle this problem and had been making considerable progress. In this district the use of artificial manures had become a general thing. Very large quantities were being used to supplement the farm manure. One of these manures was sulphate of ammonia combined with superphosphate. They should always use these to supplement organic manure and not to replace them. In certain quarters it was being said that it was unpatriotic to use artificial manure because it came from Europe. If they should think so, the remedy was to make these things in India. What he wished to say was that, if it should be a good stuff, it should be used. In order to conserve organic manure greater care should be taken with regard to cattle manure,

* At the Mirasdars Conference at Aduturai.

the two methods for the conservation of cattle manure being one, the loose box system and the other the dry earth system. In addition to this it was possible to make synthetic farm manure which was found to be very useful.

He hoped that the Agricultural School, the proposals of which had been approved by the Board and would be shortly placed by him before the Government would be started before he would be leaving this country.

In conclusion Mr. Anstead said that the Agricultural department stood for the good of the mirasdars and they were not interested in raising the taxation. Their main desire was to teach better methods of farming and how to improve the prospects of the mirasdars.

Opening Speech by the Honourable Minister*.

I am thankful to you for the honour you have done me by calling upon me to open the Conference of Trichinopoly and Tanjore ryots today. Your call, I felt, was a call to duty, both in my official and private capacities.

In olden times, matters affecting the common weal were often discussed in congregations of elderly people, who had vested interests. Our conferences are no more than those congregations, except that we observe certain forms and conventions, which modern environments require. We meet in conferences of this kind to give expression to our grievances and needs, to pass resolutions and to forward them to the authorities concerned for such relief that they might afford. I am inclined to think that, beyond this, we should endeavour to be self-dependent, wherever it is possible.

As one connected for sometime past with the administration, I may tell you that the exigencies of administration do not very often permit the grant of all the demands you make—not that the Government are unwilling to meet your wishes, but circumstances are such they feel it impossible to give effect to all your resolutions. I am anxious, in my own humble way, to be useful and serviceable, but I often find it is not possible to satisfy all. The Government are no doubt, desirous to do all they can to improve the condition of the agriculturist. It is their interest as their chief source of revenue is from the landowners. The disadvantages under which the agriculturists suffer from are really many, and they are being gradually removed. Irrigation is the chief thing and several schemes for different areas come up before the Government for consideration. The financial position is such that the Government can ill afford to give effect to all such schemes but they have never failed to consider schemes of urgent necessity and of lasting benefit to the ryots. I should not be misunderstood as one holding brief for the powers that be. I would very much wish that we are more self dependent and self-sufficient. In all our demands, we must

* At the Aduturai Conference.

be united. Very often the Government are in a fix as to what to do when there is divergence of views among the same class of people in reference to schemes of public utility.

Ours is purely an agricultural country, and its prosperity is bound up with the welfare of the agriculturists. The Agricultural department is doing its best to render all possible help to the agriculturists in improving the soil, and increasing its yield by application of scientifically prepared manures and adoption of selected strains. The several Demonstration Farms which are the results of weary researches, are intended to give practical lessons to cultivators in the several stages of cultivation. Besides these demonstration farms, demonstration vans are now taken round villages to give lessons through magic lantern, exhibit new strains and show by illustration the increase in production by the adoption of new and scientific methods. Bulletins and leaflets in several languages are issued to propagate the results of research work, and to enable the enthusiastic agriculturists to try those methods with profit on their own lands.

Seeing that full advantage of the existing demonstration Farms is not taken by a large section of the agriculturists, the department has for sometime past been demonstrating in private holdings the new and improved methods side by side with the time-honoured methods, to show the difference in results between the old and the new methods of cultivation. Besides, fairly extensive areas are taken on lease from big landholders, and there also the new methods are adopted for the enlightenment of the agriculturists. Such propaganda work which is essential requires an additional experienced staff which means enhancement in expenditure. This enhancement in expenditure is sure to have its own return, and it directly goes to the advantage of the ryots. The Director of Agriculture, whom we are happy to find in our midst today, is very keen on propaganda and I shall congratulate him on the various means he is adopting successfully to work out the campaign of propaganda.

Gentlemen, you know that the market is now flooded with a number of fertilisers the manufacturers of which are advertising their respective usefulness and value. To save the agriculturists from wasting their money on fertilisers of doubtful utility, the department has in view a scheme to carry out experiments with these new fertilisers so as to be in a position to tell the mirasdars of their relative value. The Director has proposed the opening of an experimental station where these various new fertilisers will be tested by the Department in collaboration with the selling firms.

I am alive to the difficulties we landholders, labour under, taxation, defective system of irrigation in certain areas, difficulties of marketing our produce, high cost of cultivation, increased wages to labour and above all, freaks of nature. The gradual decadence of the land holding classes is mostly due to indebtedness owing to various causes, social as well as economic, not to speak of modern ideas of living. Endeavours are being made to remove agricultural indebtedness by the opening of land mortgage banks. Here also the success of the endeavour lies very much in our own hands. The Royal Commission has offered several suggestions to surmount other difficulties the agriculturists are subject to. A provincial committee has been formed, and ere long it would contrive ways and means of giving effect to the several recommendations of the Royal Commission. In this connection, I would be failing in my duty if I should omit to express our feelings of grateful thanks to His Excellency Lord Goschen who is taking an enthusiastic interest in all agricultural problems. May I tell you in all questions concerning the Agriculturists, he has always exhibited a very generous attitude. His Excellency always has their best interests at heart.

Real work begins in the villages. Old organisations which were the life of the village and of the Nation are neglected. Revive those organisations and if each village could organise itself on proper lines National prosperity is well nigh assured.

A wave of industrialism is passing through our country, and I want you not to ignore the great fact. You

should revive as far as you can, those cottage industries that have gone to ruin. Agriculture is not going to keep our people engaged all through the year. Give stimulus to our old cottage industries and revive them. With the agricultural advancement and industrial regeneration side by side, we are sure to have the dawn of a better day, which would give India the land of ages, its rightful place amongst the most advanced Nations of the world.

Gentlemen, I thank you again for the honour you have done me. I declare this Conference open, and wish your deliberations all success.

**Note on the cultivation of Bunch (Gudiyatham)
Variety of Groundnuts in Kurnool and
Cuddapah Districts.**

BY JAGANNATHA RAO.

In the black cotton soil area of Kurnool and Cuddapah districts the cultivation of Groundnuts has increased very much. It has replaced all the pulses and is encroaching on cotton. For instance in Proddatur taluk, the Groundnut has almost already replaced Cotton as will be seen from the following figures.

Names of the Crop.	1921-22	1922-23	1923-24	1924-25
Paddy	12556	12689	11220	11901
G. Nuts	13447	26689	27968	28837
Cotton	15058	14943	17846	15912
Jonna	50429	45312	50346	52609

Names of the Crop.	1925-26	1926-27	1927-28	1928-29
Paddy	12866	12835	12454	...
G. Nuts	39615	39472	41376	...
Cotton	9284	4987	2533	...
Jonna	46547	47480	44230	...

The soils are stiff and consequently the harvest of the crop is very tedious and costly. Considering the present labour scarcity and the tightness of the money market, many a ryot is thinking of giving up the cultivation of Groundnuts. The present variety that is cultivated is Mauritius—Commercially called Coromandel Machine shelled.

The Department first distributed the bunch (Gudiyatham) type in three places in 1926 after obtaining the seeds from the IV Circle. The seeds were distributed at Proddatur, Nandyal and Adoni, in Cuddapah Kurnool and Bellary districts respectively. The yields are good, some times going up to 70 Maunds per acre; and the cost of harvesting is considerably less than that of Mauritius

variety and the process of harvesting is also easy. So it is gaining ground year after year. The kernels of this type came to the open market just this year only, and at the outset some unforeseen difficulties have set in.

The most important difficulty is this. The two important purchasing Firms Messrs. Ralli Brothers and Volkart Brothers have instructed their sub-agents in these parts to offer one to two rupees less for the Bunch type than that of Mauritius. I may say that Messrs. Volkart Brothers have named all the bunch varieties grown in South India as Natal while the Rallies have termed them as "Khandeish." Whatever may be the name, it appears to be certain that the bunch types seem to be Spanish in their origin. Further the companies have instructed their sub-Agents that if the local variety lots contain more than 5 per cent of the bunch variety they can refuse the lots, but they can be taken if offered in separate lots.

I find from Mr. Lieberherr's note on Indian Groundnuts that the oil contents of this type have increased now by 2% more than what it was at the beginning and this is said to be the cause for the spread of this type in South India and in Mysore.

The exact reason why the Exporters prefer the spreading variety is not known. For the oil contents of the Gudiyatham Bunch is not in any way less than that of the Mauritius as is seen from the reports of the Government Groundnut experimental station Palakuppam 1927-1928.

Oil contents of the Gudiyatham Bunch	...	45.80%
"	Mauritius	 45.75%

It may not be out of place if I mention that Mr. Lieberherr gives the following percentage of oil contents.

Mauritius (Coromandel Machine shelled)	44% to 49%
Natals (Bunch variety Grown in South India)	44% to 49%

In European markets I understand that France alone prefers the bunch.

It is observed in some places that the out-turn of the kernels to the unshelled is greater in the spreading variety than that in the bunch. Taking the well-dried nuts it is observed in Nandyal centre that 28 Mds. or 747 lbs of unshelled bunch variety gave 531 lbs of kernels. (One French Candy) in the case of the spreading while 29 mds. or 773 lbs. of unshelled bunch variety gave 531 lbs. of kernels. Taking this to be correct, even then, it is only the middleman, who purchases the nuts and decorticates them, that is the loser and not the exporter. Therefore it is certain that this is not the real reason for the low price offered.

I therefore request gentlemen who have a better knowledge of this problem to kindly enlighten me on this question through the columns of the journal. If we are to popularize the bunch variety it is essential that we should know the exact position of the Gudiyatam bunch in the commercial world. In particular I should like to know the exact reason for the low price offered and the difficulties the European markets experience with this variety.

A Hike to the Thadagam Hills.

BY KRISHNA.

A rumour came floating to several of us that an elephant was being trapped in a place about 20 miles from the College. The rumour became a Fact. The spirit of adventure and curiosity was aroused.

With all eagerness and buoyant spirit, we started on our two wheelers at 7 A. M. to the hills to see the elephant. Ere we had covered 3 or 4 miles the receding mountains towering on high covered with vegetation seemed to stop and wait our approach while fields in front disappeared after we reached the village at the foot of the range. Look at Nature's handiwork, the sloping walls of the hills approaching and receding quite naked, suddenly becoming perpendicular like the huge compound wall surrounding the "Eternal City". The encircling atmosphere filled our hearts with romance and the greatest admiration for Nature's handiwork. As for fun, we had them in heaps, as on our way one by one skid on the sandy strips. For a mile or two the road was sandy. It is true we started in quest of the captured wild elephant but not one of us knew the real spot; on our way we were making enquiries as to the distance and the locality. We plodded our way without a murmur; we reached a traveller's bungalow at the foot of the hills where we left our bicycles and we started on our climb at 2-15 A. M. sharp and imagine our surprise when we had to get over steep, tortuous rocky paths strewn with all sorts and sizes of stones which gave us a slippery footing. Up the steep we went and we covered nearly 3 or 4 miles in this manner. All of us were breathing hard and the footpath in certain shades covered with dead leaves yielded to our feet and it was of course more welcome to us. From thence our narrow path ran through closely wooded forests and through leafytunnels through which the sun beams sneaked into or through paths that led through cool leafy bowers through which the sunlight played and lightened the dark undergrowth. On we plodded an 5 more miles we covered. Everyone of us was

impatient to see the elephant and our wish seemed to be eluding us. On our way we came across a winding brook which ran in and out through the undergrowth over a bed of pebbles, transparent and pure, we halted and took a refreshing drink and began our march with more pep and energy. The march had already begun telling on us as it was past midday and our stomachs were pinching and by unanimous consent we got a biscuit a piece to munch. We munched that biscuit and it appeared more delicious than it would have been ordinarily. Since our milk supply for the coffee was of the required quantity we had to make a shift by taking only half an ounce of milk each to keep our tongues from sticking on to our plates. Then the truth, how the Arctic and Northpole explorers and other adventurers must have felt when their ration was getting diminished while they were struggling in unknown region far from human habitation and also how they must have faced the exigencies and gone with a slice of bread for a full meal came home to us. At about 12.30 we heard the thud of the axes. We construed it to be some woodcutter and we did not know the exact place, since even our guide had lost his way. As we advanced, nearer to our right the thud came and we pressed through the foliage with delight to see the trap and our place of destination a couple of yards ahead. One of the party Mr. N to whose uncle the elephant belonged by capture was recognised by the foreman of the ranch and he gave us a cordial welcome. We halted and unpacked the eatables, made an equal distribution of them and took a cup of coffee to wash it down.

The place is about 9 miles to the west of Thadagam. The place of capture on the hills is about 3000 feet from the foot and the land belongs to one Mannarkot Muppan Nayar who owns 2,25000 acres of forest areas. The contractor Mr. Ramanatha Ayyar who captured the elephant pays Rs. 300 to Muppan Nayar as lease for each elephant caught and for capture and training and the expenses would come to about Rs. 1000. The preliminary expenses amount to Rs. 1500 and the elephant may fetch 3 to 5 thousand Rupees to Mr. Ayyar. The trap was laid near Vellaikulam village.

Then we made an inspection tour round the ranch and came to learn the method adopted in trapping the elephant. The trappers first of all pick out the most frequented spots of the elephants and start laying the trap. It is simple and ingenious and consists in cleaning the bushes for some distance in one of the likely spots and a pit is dug out 14 feet square with a depth of 20 feet and the width narrows to 13 feet at the bottom. The pit is then covered with bamboo poles and over which loose soil is dumped and beaten down and some grass is raised to make it resemble the surroundings. The unsuspecting elephant on its way to the brook steps over the trap and down goes the monarch of the forest and realizes too late the folly of having taken a wrong step. One can clearly hear the roar it must have made and imagine the vain efforts which its comrades must have made to lift him out of the pit. The man on the look-out telegraphs the news to the foreman of the ranch who the next day arrives and builds a hut of *kusa* grass and encamps near the spot. His men start building a wooden cage at ground level from one of the sides of the mouth of the trap. The tame elephants help in dragging logs of wood which are used in building a cage 15 feet high with barely moving space for the elephant. These logs are notched into one another horizontally like a fence and made strong with a flooring of wooden beams. By this time the wild fellow is slowly made to behave more gently and respond to the orders given from the pit's mouth. At first for a space of two or three days the liberty loving elephant puts on a hunger strike but hunger has its way and it submits to the gentle treatment from its captors. It is the necessity of the flesh that turns a free roaming lord of the forest to a helpless captive in the hands of men.

The elephant was a buxom maiden of sixteen summers, perhaps with many a suitors vying for her hand. She is now no more her free self and who knows, she may be destined to carry the Howdah of a Maharajah or spend her life hauling timbers in the wood and alas no more a free forester. And the truth that even elephants turn traitors to their own kind is seen by the great help the tamed one, renders in the subjugation of his wild sister or brother and

making it feel contented with the new life. Yes! It is true the wild one puts up a game fight for its "complete independence" but since it was to fight against the masterly brain of man it is brought to subjection in the end.

The elephant after 10 or 15 days is slowly raised from the pit to the ground level by throwing in leafy branches into the pit, which serves also as fodder and it is raised to the ground level only after the cage or barricade with only one entrance facing the pit is prepared. The professional knotter passes a rope round the head of the elephant from above and the animal is noosed; the level is rapidly raised and the noosed rope is pulled by hundred or more coolies while the old tuskers stand near the entrance of the cage and goad the new fellow in.

The elephant is now caged in and the training process begins. After several days the elephant is shifted from there to another place by the tuskers where it is shoved in the company of a herd of tame ones; and the taming takes 4 to 6 months. Then no other animal can beat the obedient, strong intelligent worker and its indefatigable energy.

In the Kheddha in Musore, the initial stage of capture differs very much as it is an organised one. Strong big stockades of timber are built; Four hundred to five hundred beaters are engaged and drive them by beating drums and making a huge uproar on the three sides. The side leading to the road of the stockade being left open, the gathering herd make a run into the stockade. The catch of the gate is let go and the herd finds itself trapped. After they are calmed down two tuskers are sent in and these take out the nearest elephant and force him outside to a picket where it is tied by chains to trees to get used to captivity. Ten to one the tuskers will have a hard time and are also trained to fight if need be. They are yoked to a wild elephant and taken to drink water and made to work when sufficiently broken.

Coming to the end of our day's hike, we had a hearty meal though simple prepared by one of us and then all of us had a short ride on one of the tuskers. Oh! what lot of fun it is to ride on a moving mountain of flesh! We started

from the camp at 3.45 P.M. after thanking our host and bursting forth into a "Hip, hip, hurrah" for the newly captured elephant and the successful trappers. All of us got ourselves provided with bamboo sticks from the abundance of the bamboo clumps near by. They were of great help to us in our descent as they gave us a firmer foothold and something to lean upon, especially when descending the rocky footpath. Some of us with great expectation looked out for hyenas and panthers but were disappointed. We reached the foot at 6 P. M. and at the travellers bungalow took our lunch of biscuit and cold water and started pedalling. We reached the hostel at 8 P. M. sharp after a ride of two hours in the dark as we had overlooked to provide ourselves with lamps and had to shift with only one lamp. It was the opinion of the bikers that they had a glorious time of it and I lay a wager that the taste of the pudding is in the eating of it and so did the bikers.

EXTRACTS.

On the Advancement of Science by Published Papers.

Undoubtedly Science is kept alive by teaching; and without good teaching, there can be but little discovery. Edison, for instance, when young, possessed and studied Faraday's masterly researches on Electricity.

The present writer has been engaged in scientific research for eighteen years or so. He does not pretend, however, to have observed all the following rules, of the importance of which he became cognizant by degrees. The foundation of the co-operative fabric of science and scientific discovery has been built up, by the work of early "missionaries of science," when research entailed more or less of a martyrdom. It is hoped that we can pass on posterity this edifice of science, undecayed and even embellished, now that research is a privilege and a giver of prestige. If we do not, the position of science and scientific work may deteriorate without limit.

(1) The truth and nothing but the truth, but never the whole truth for publication. One must omit trivialities. Our scientific magazines are now sometimes more or less packed with never to be utilised details, most of which perhaps would have better rested in the notebook. The penalty for non-observation of this rule is the, probably now imminent, cessation of publication, except in the form of abstracts.

(2) It is perhaps unethical for a research worker, as for a medical man, to advertise. Plethoric papers, pictures not absolutely necessary, repetitions in different magazines, references mainly to one's own work, and unneeded elaboration or enlargement of figures, seem to partake of the nature of advertising. The penalty for infraction is the introduction of competitive business methods into science as an ideal; instead of the co-operative aims, which have produced such good results in the past.

(3) Mere facts, however new, are often (though not always) of perceptible scientific value only when their discovery, or some one else, has demonstrated their relations to other facts, or to a theory or hypothesis of value. If they have no such demonstrable relations, they are probably "trifling though true." The penalty is again the ending of magazine publication *in extenso*.

(4) The repetitions and confirmations of a discovery on similar or related material are of sufficient scientific interest to warrant full publication only to a certain degree of repetition. Whether this is ten or a hundred times, the point is at length reached when only the accounts of exceptions to the rule are worth full publication. The penalty is again the flooding of magazines, and the future reduction to abstract publication.

(5) The publication of a working hypothesis by one who has discovered a sufficient amount of relevant fact is welcome, and indeed almost necessary. (A working hypothesis is one that is immediately to be tested). But a mass of untested hypothesis is readily producible; and may be aimless, except to fill space. A flood of hypotheses, which cannot be immediately tested, may be a brake on the progress of a science. Since it is easier, for many of us, to spin hypotheses than make discoveries, the penalty for the appreciation and prestige of this form of mental exercise is the partial, or even complete, cessation of experiment.

(6) It is probably unethical to claim credit or priority for an untested hypothesis (mostly for writers in the distant past), to the prejudice of those who have borne the full burden of testing it. A writer who has published, among the number of unworkable hypotheses, one which has subsequently been used as a successful working hypothesis, does not apparently deserve to be cited. Perhaps one should not attach priority to any untested hypothesis, but only to true working hypothesis.

(7) It is generally recognised that, in a serious scientific paper, citations of a genuinely relevant previous work should be complete, so far as they are not known to all readers. Even excessive and pedantic citation is a fault on the

right side. But surely much space might be saved by referring to standard numbered annual lists of scientific papers. The penalty for lack of citation is, of course, to leave it doubtful as to how much the writer has himself discovered. It leads also to the isolation of workers or countries. But excessive citations again overload the magazines.

(8) A form of scientific co-operation consists in the sending of separate copies of papers, in not readily accessible magazines to other interested workers. This has now extended to all magazines, even those accessible to everybody. Stanley Hall regards it as a means of working up a personal following or constituency; in other words, it is now an advertising method. Perhaps as much as anything else, it injures the circulation of the scientific magazines.

These and other similar rules are, of course, well known to, and observed by, many experienced workers.

(The Philippine Agriculturist Jan. 1929.)

The Chief Functions of Mineral Constituents of Feeding Stuffs.

The requirements of mineral matter or salts received but very scanty attention until recent time. The chief functions of the mineral constituents performed in the animal body are the following:—(1) They are necessary for the maintenance of a proper physiological balance between the mineral elements in the body fluids. Any excess or deficiency of any one of the mineral constituents will affect the vital processes. A deficiency of potassium in the blood will act on the heart muscle and prevent it from relaxing properly, while an excess makes it relax so much that it stops beating. Common salt is an absolute necessity for nutrition, but given in excess will act as a poison and cause serious troubles. The mineral constituents maintain the practically neutral reaction of the blood. (2) They are necessary for the process of digestion. The digestive processes are affected by acidity and alkalinity of the digesting fluids. In the stomach an acid reaction must exist to aid in the pepsin digestion; whereas in the small intestine an

alkaline reaction is necessary to allow the trypsin to act. The absorption of the digested products again is controlled by the concentration of the salts, and this concentration will also affect the passage of digested and undigested material along the intestines. (3) Mineral constituents are required as constructive material for the formation of new tissue and building up of the bone skeleton. (4) Milking animals require larger supplies of mineral matter to keep up the yield and average composition of the milk secreted.—J. C. Brunnich, Agricultural Chemist, Queensland Department of Agriculture.

(Extracted from the Agricultural Gazette of New South Wales, March 1st. 1929. P. 226.) Y. R. RAO.

The Philosophy of work

To the people of this country who waste their time and energy in mud slinging and bickering over non-essential political differences the following paragraph on the philosophy of work uttered by Dr. Glen Frank, President of the University of Wisconsin, ought to be an eye-opener.

"Humanity is hag-ridden by the ancient tradition that work is a curse. We turn to toil as to the serving of a sentence. We look for happiness behind the barricaded walls of pleasure. Happiness cannot be switched on, like an electric current, after office hours. If we cannot somehow manage to find satisfaction in our work, there is small chance that we shall find it outside our work. Men's work must be made a means of self-expression as well as a means of self-support. We must see that it provides, first, difficulty enough to give us a sense of mastery when it is done, we are happiest when we find in our work a moral equivalent for that mood of adventure and thirst for conquest that we have dragged along with us from our days of savagery. Second, we need routine and variety mixed in the right proportion; routine is not the enemy of happiness that it is sometimes painted to be; the amount of routine in our work must be adjusted to the amount of creative ingenuity we possess. Third, we need a sense that we are creating something we can see and claim as our personal accomplishment. Fourth, we need congenial associates."—(Land and Life—February 14th D. S. R.)

GLEANINGS.

The Lovat Committee have submitted a unanimous report on Veterinary Research and administration in the non-self governing dependencies. They were impressed with three outstanding defects:—lack of an advisory authority at the colonial office, lack of a central research station and lack of an adequate system of supplying information to officers.

Their recommendations include the creation of a Central Research Station in East Africa, improvement in status and conditions of service in the departments, better provision of teaching in Veterinary science including nutrition, genetics, biochemistry in colleges in Britain, postgraduate instruction and attractive salaries and a United colonial veterinary service.

Cuba is now at the parting of ways and is waking up to her present situation. With the condition of sugar abroad she sees danger if she cannot improve her ways and think of irrigation and fertilisation of canes and co-operation of the cane grower and the factor as the chief means of keeping the cane industry alive.

In his annual summary of the weather of 1928, Dr. I. M. Clive, New Orleans, observes that the average temperature for the whole year was 69·2° varying from January with a monthly average of 52·5 to August with an average of 84·8. The total rainfall was 72·76 inches with the heaviest rainfall on June 3—4 when 5·48 inches fell. He states that spring was warm, autumn cool, and mean annual temperature close to normal.

J. R. Bowell the pioneer in cane seedling work in the West Indies died in November at an advanced age of 74 years.

4 per cent increase in world sugar production this year with continued low prices is predicted by the U. S. A. Department of Agriculture.

The Leaf-Butterfly—A mistake and an example.—The "Leaf-butterfly" or *Kallima* is invariably shown in all museums mounted on twig and posing as a dead leaf. Even the British Museum has fallen into this error. The laboratory worker noticing the close resemblance of the shape of the wings of this butterfly, and of the colouring of the underside to that of a dead leaf, comes to a fallacious conclusion that the butterfly when alarmed immediately settles on a twig and assumes the role of a dead leaf. Specimens of the insect are thus mounted and exhibited to the public as example for protective mimicry. A little reflection ought to show us that it would be difficult for the insect when suddenly alarmed, to find at a moment's notice a suitable twig and shape of leaf in which to merge itself. As a matter of fact the truth is stranger than the laboratory worker's fiction. I have studied *Kallima* on the Nilgiris, and find, that when alarmed it darts into the jungle, closes its wings and drops to the ground, at the same time falling over on its side, and such a position looks exactly like a dead leaf. It matters not whether the leaves around match it or not, for in the average jungle you will invariably find an odd lot of foliage decaying on the ground. I may add that this habit is not confined to *Kallima* alone so that there is less excuse for the perpetuation of the fraud. Incidentally I may mention that I have frequently noticed *Kallima* to, fly and settle on the trunk of a tree when alarmed in which position its colouring merged with the colouring of the bark. A similar habit is indulged in by the *Vanessidae*.—Lt. Col. C. F. C. Fraser., *The Hindu Illustrated Weekly* Jan. 20, 1929.

Fighting Bugs with Electricity.—Experiments consisting of a series of radio treatment to orchards are being carried out in Washington State. Electricity under high voltages and at high frequencies is omitted for a certain period every day through a net work of wires suitably placed over the trees. Chemical reaction in the atmosphere occurs in the neighbourhood of the wires; this has proved very beneficial to the crops, and trees treated daily for half an hour been cleaned of Aphide and scale-insects. Insects have also been killed by this method in green-houses.—M. E. Compton in "Better Fruit," Y. R. Rao.

Sugar and Longevity.—A newspaper dispatch from Jassy, Rumania, under date of February 5, told of the death of Mme. Bella Pollack at the advanced age of 118 and mentioned that she was the mother of twenty-one children, the eldest of whom was 85. Continuing, the report added: "She attributed her longevity to a regular diet of black bread and sugar. She ate $2\frac{1}{2}$ lbs. of bread and a pound of sugar daily. She said she had never been sick in her life until her final illness."

Soaking seed cane.—E. J. Barke;—An. Rept. Bur. of Sugar Expt. Stations (Qsld.) 1928 Comparative estimates were made to determine the effect of soaking seed cane in various solutions before planting. The experiment comprised the following plots:—

(1) Soaked in saturated lime-water for 48 hours; (2) Soaked 48 hours in saturated lime water containing 1 lb. magnesium sulphate to 50 gallons of water; (3) Soaked in water for 48 hours; (4) Ordinary planting. Results are given as follows:—

Plot.	Germination per cent.	Tons cane per acre.	Tons sugar per acre.
(1)	95	40.6	6.29.
(2)	97	42.2	6.46.
(3)	93	38.5	6.01.
(4)	88	35.6	5.61.

All the Australian Sugar cane experiment stations have secured good results from these methods and there is no doubt about the benefits to be derived from soaking.

NOTE.—Similar favourable results from soaking seed cane have recently been obtained by investigators from different quarters of the globe.—Editor.

Celotex Order to India.—Chicago, Feb. 4:—The Celotex Co. is beginning its export business for 1929 with more than 100 per cent. increase in business over 1928, and expects to ship approximately 100,000,000 sq. ft. of Celotex and insulation board this year to 75 countries, compared to 40,000,000 sq. ft. exported to 70 countries in 1928, according to B. G. Dahlberg, president.

The first largeshipment, of 500,000 sq. ft. to India, is now for distribution in new district depots recently established in Ceylon, Rangoon, Bombay, Calcutta, Karachi, and Madras.

It is also stated that contracts calling for the use of fifty million feet of celotex in 1929 for insulating mechanical ice-boxes have been made by the General Electric Company, Frigidaire, Copeland, Kelvinator, and other electric refrigerator manufacturers. Acoustic-celotex for sound deadening the machine compartments of some of ice-boxes is also being supplied.

Growing good Lettuce.—If you would have really good lettuce do not rely on one sowing only. It is better to sow a little seed every ten days or so than make one sowing only. Do not sow thickly. Try the plan of manuring a shallow trench, covering it with fine soil, and then dropping two or three seeds at given distances, say 4 inches apart. Little thinning will be required, and the plants will make uninterrupted growth. These will mature quicker once they get a start than transplanted plants.

Successful tests have been made of a machine for transplanting winter oats seedlings. The apparatus consisted of a small plow pulled by hand. Behind a coulter which cuts a furrow at regular depths, is a revolving wheel on which the young plants are fed; this wheel is supplied with hooks or fingers and as the wheel turns, these hooks

grip the seedlings and convey them into a groove around the wheel which turns the roots downward and puts each plant into the furrow made by the plow. The little back wheels gather and press the soil around the plants which are thus deposited regularly at the right depth and spacing.

Dangers of High Cutting of Canes Larvae and pupae of the weevil borer (*Rhabdoenemis obscurus*-Boisd) generally occur in the last few inches of the stick at about groundlevel. One of the methods of checking the increase of this beetle is to cut the crop low. If cut high, these larvae after transforming into pupae and stopping in tunne for a time ultimately produce beetles which infect ratoons. High cutting has a tendency to encourage spread of moth borers of cane the caterpillar of which show a preference for shoots originating from buds above ground.

APPENDIX.

DEPARTMENTAL NOTIFICATIONS.

GAZETTED :—Mr. A. V. Tirumuruganatham Pillai, Assistant Director VI Circle, Madura, leave on average pay for one month and 27 days from 20th February. Mr. M. Mangesha Rao, on relief from I circle to officiate as Assistant Director VI circle. Mr. S. U. Khan, Deputy Director VI circle leave on average pay for 3 months and leave on half-average pay for 3 months from date of relief. Mr. G. R. Hilson on return from leave to resume the post of Cotton Specialist. Mr. R. C. Broadfoot, on relief is posted to Madura in relief of Mr. S. U. Khan. Mr. C. K. Viraswami Ayya Statistical Assistant to the Director, leave on average pay for one month from 18th February.

NON-GAZETTED :—Appointments, transfers, etc :—

Mr. K. P. Ananthanarayana Ayyar, temporary assistant in Entomology to be assistant V grade on probation. Mr. M. S. Subbiah to be temporary assistant V grade on Rs. 85 Mr. P. Satyanarayana, assistant V grade Chemistry section is confirmed in his post.

Mr. T. Krishna Reddi, assistant, Millet Specialist's section is transferred to III circle as Upper subordinate. Mr. C. S. Malayya Manager, Paddy station, Pattambi is transferred to VII circle. Mr. M. P. Sankaran Nambiyar, Second Agricultural teacher, Taliparamba is posted as manager Pattambi Paddy station. Mr. L. Sankarakumara Pillai, demonstrator, Melur is posted to the new sub circle Tinnevely. Mr. C. S. Sankaranarayana Ayyar is posted to Melur as demonstrator. The following transfers of demonstrators are made in the VIII circle :—Mr. Dasappa Malli to Bhavani. Mr. P. V. Hanumantha Rao to Kollegal and Mr. N. Brinivasa Rao to Tiruppur to relieve Mr. G. K. Subramanya Ayyar.

LEAVE ETC :—SECOND CIRCLE :—Mr. Y. Venkateswara Rao assistant demonstrator, Masulipatam leave on average pay on medical certificate for 12 days from 11th February.

THIRD CIRCLE :—Mr. V. N. Subbannachar, demonstrator, Bellary leave on average pay for 4 weeks from 1-2-1929. Mr. C. Subba Rao Nayadu, assistant demonstrator, leave on average pay for two months and 18 days and leave on half-average pay for one month and 17 days from 28-1-1929.

FOURTH CIRCLE :—A. S. Nityakalyana Reddi, assistant demonstrator, Conjevaram, leave on average pay for two months on medical certificate from date of relief. Mr. T. V. Balasubramanya Ayyar, Manager Palur, leave on average pay on medical certificate for 12 days and leave not due on half-average pay on medical certificate for 80 days from 14-2-1929.

(ii)

FIFTH CIRCLE.—Mr. A. R. Krishnamurthi Ayyar, assistant demonstrator Tiruvalur, leave on average pay for one month from 28-1-1929 Mr. P. V. Samu Ayyar, assistant demonstrator, Manapparai leave on average pay for 20 days from 2-2-1929.

SIXTH CIRCLE.—Mr. A. Ramalinga Ayyar, demonstrator, Sholavandan extension of leave on average pay for one week from 22-2-1929.

SEVENTH CIRCLE.—Mr. A. Kunhikoran Nambiyar demonstrator Palghat leave on average pay for 15 days from 7-2-1929 Mr. P. Kesavanuni Nambiyar demonstrator Badagara, leave on average pay for one month from date of relief. Mr. E. K. Nambiyar manager Kasargod extension of leave on average pay for one month from 19-2-1929. Mr. C. S. Madayya demonstrator, leave on average pay for one month and 15 days from or after 4-2-29.

EIGHTH CIRCLE.—Mr. G. K. Subramanya Ayyar, demonstrator, Tirupur, leave on average pay for three months from 15-2-29

CURATOR OOTY.—Mr. K. K. Hedge, assistant manager, Nanjanad, leave on average pay for 20 days from 9-2-1929.

CENTRAL CATTLE FARM, HOSUR.—Mr. N. Narahari Rao assistant manager leave on average pay for 26 days from 11-2-29.

M.S's SECTION.—Mr. N. Krishnaswami, assistant extension of leave on average pay for one month from 3-2-1929.

COTTON SECTION.—Mr. V. K. Subramanya Mudaliyar, assistant, extension of leave on average pay for two months from 12-2-29. Mr. V. Chidambaram Pillai, manager Koilpatti, leave on average pay on medical certificate for three months from date of relief.

G. A. C's SECTION.—Mr. B. S. Narasimha Ayyar Assistant leave on average pay for one month and 7 days from 24-1-1929.

NOTICE.

The Punjab Government (Ministry of Agriculture) offers a prize of Rs. 2,000/- for the design (detailed scale drawings) of an improved Persian wheel. Drawings must be sufficiently complete to enable any manufacturer to make up the wheel in all details. Competitors must observe the following conditions:—

1. The design must show a distinct advance on any persian wheel known at the present time.

2. Durability, lightness, easy running and low costs will be specially considered.

3. Drawings must be submitted to the Agricultural Engineer to Government Punjab, Lyallpur, not later than 15th February 1930.

(iii)

Drawings will be examined by an expert of Government, and one or more designs may be chosen from which the actual persian wheels are to be constructed for test purposes. The authors of selected drawings will be required to manufacture wheels or parts according to their drawings, and the cost of their manufacture will be borne by Government, but in no case a sum exceeding Rs. 400 be paid for the manufacture, the delivery and the erection of a complete persian wheel at Lyallpur.

If in the opinion of Government no wheel complies with the above requirements the prize will be withheld and if a wheel composed of improved parts from several designs sent in is approved, the prize will be suitably divided. The decision of Government will be final.

Any design winning a prize will become the property of Government.

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(iv)

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There are only about two months for the College Day and Conference 1929, and all arrangements have to be made within this period. Those who have promised but have not yet remitted their contributions are requested to send in their amounts without further delay.

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 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 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 1929, with a covering letter showing full name and address of the sender. The authors 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.
 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.
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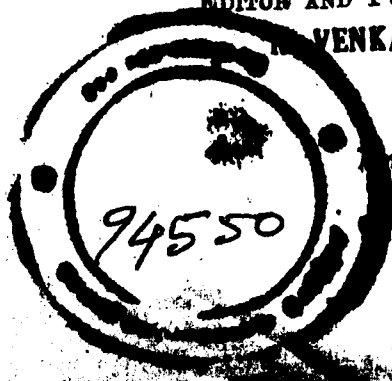
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