

The Madras Agricultural Journal.

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

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AGRICULTURAL COLLEGE DAY AND CONFERENCE 1938.

The twenty-seventh College Day and Conference organised by the Madras Agricultural Students' Union was held this year at the Research Institute, Coimbatore, on the 21st and 22nd of this month, under the distinguished presidency of the Hon'ble Mr. V. I. Muniswami Pillai, Minister for Agriculture and Rural Development. The Conference attracted many visitors, including Messrs. N. S. Varadachari, Parliamentary Secretary, V. C. Vellingiri Gounder and V. C. Palaniswami Gounder, M. L. A. The Director of Agriculture, the Deputy Directors of Agriculture and some of the other officers of the department were also present.

The session commenced at 12 noon on the 21st instant. After reading the messages received from a number of patrons, members and well-wishers of the Union, the Secretary presented the report of the Managing Committee for the year 1937-'38.

Welcoming the Hon'ble Minister for Agriculture and Rural Development and the visitors to the conference, Mr. R. C. Broadfoot, the Principal and ex-officio President of the Union, referred to the constitutional and departmental changes that had taken place since the last College Day. He concluded his welcome speech with an appeal to the students, past and present, to continue their active support to the Union.

The distinguished President, after awarding medals and prizes to the successful candidates, delivered a very interesting and instructive speech, outlining the policy of the Government in the matter of improving the activities of the department and increasing its usefulness to the agriculturist. He also dwelt at length on measures taken by Government to improve the lot of the ryots by passing Acts, like the Debt Relief Act and the Prohibition Act.

Thirteen interesting papers were read at the Conference by departmental officers and non-official workers.

The first session was held from 12 noon to 3 p. m. when five papers were read. During the next day, the session commenced at 9 a. M. and closed at 2 p. m.; eight papers were read; and the discussion that followed

was lively and animated, specially on the paper on 'Bridging the gulf' by Mr. G. Mahadevan.

The President, in winding up the proceedings, dwelt at length on the several points raised in the discussion of the papers and gave an assurance of Government's help and sympathy in the endeavour of the department to improve the condition of the ryot. Mr. P. H. Rama Reddy, the Director of Agriculture, on behalf of the Union, thanked the Hon'ble Minister for having consented to preside over the Conference. He also expressed his thanks to all the visitors who contributed to the success of the function. This was followed by a vote of thanks proposed by Mr. V. Ramanatha Ayyar, the Vice-president of the Union.

On the 21st night the students of the College entertained the Minister and other visitors by staging dramas and farces in English, Telugu, Tamil and Malayalam.

A welcome feature of this year's Conference was a pleasant and enjoyable trip arranged at the instance of Messrs. P. S. G. and Sons, to their Charity Industrial Institute at Peelamedu. A fleet of cars was made available to the delegates by the P. S. G. and Sons for the excursion; and they were 'At Home' to the visitors.

Exhibition:—A big Exhibition was held from 21st to 24th inst. in the Freeman Building. It attracted a large number of visitors from the Town and adjoining villages.

Principal's Welcome Speech.

Hon'ble Mr. V. I. Muniswami Pillai, Ladies & Gentlemen,

Once again it is my privilege to express to all of you, the Madras Agricultural Students' Union's welcome to our Annual College Day and Conference, the 27th—in a long series of very successful functions. It is our hope that this year's function will outshine its predecessors and will prove instructive and enjoyable to those privileged to attend. The detailed programme now issued will indicate the scope of the Conference and I would particularly recommend a visit to the Exhibition which has been arranged in the Freeman Building.

To you, Sir, as Minister for Agriculture and Rural Development, the Union expresses its grateful thanks for accepting its invitation to preside on this occasion. We all know this has only been possible at considerable personal sacrifice and the Union appreciates the honour you thus confer by your presence here to-day. We also express our thanks to Sri. N. S. Varadachari, Parliamentary Secretary and to Sri. P. H. Rama Reddi, Director of Agriculture, Madras, for their presence on this occasion.

Since our last meeting constitutional changes of great importance have taken place. Provincial Autonomy has been inaugurated successfully and legislation of far reaching effect has been passed and put into operation.

Retrenchment in general has been necessary and the Agricultural Department has had to bear its share. Unfortunately this retrenchment has mainly affected the staff with the result that a number of B. Sc. Ag's. and ministerial officers have had to be retrenched and our normal progressive policy has had to be curtailed for the present. Departmental re-organisation has resulted in the reduction of the circles of the Deputy Directors of Agriculture from eight to four, and proposals to amalgamate teaching and research at this institute. This re-organisation carries us back to earlier days in the Departmental activities and it is to be hoped these rather drastic changes will not impair the high standard of efficiency which has been attained in this College in recent years.

The B. Sc. Ag. Examinations of 1938 have been very satisfactory and members of the teaching staff deserve to be congratulated on the results obtained. Students who have been successful in winning prizes will receive these from the Hon'ble Minister a little later in this afternoon session. I congratulate all prize winners on their good fortune and wish all who have completed their course at the College the best of luck in their future careers. Students who have diligently followed the instructions, theoretical and practical, given at this College are now equipped with knowledge which should be of great help in Rural Development and it is to be hoped that such knowledge will be freely given to those who ask for it. Students should also have learned the dignity of labour, and with the practical training given during their course ought to be in a position to undertake any practical problem which may arise in running their own farms. It is to be hoped that a larger number of students will take up practical farming and show by improved methods of cultivation and increased outturn that a course at the Agricultural College far from being a waste of money is really a sound investment for a youth who loves the country life.

Now, a word about the Union. It is regrettable that so many students on leaving this College sever their connection with this Institute almost completely. The Union exists to enable old boys to keep in touch with their *alma mater* and I hope this appeal to continue as active members will receive an adequate response from those who, while eligible, are not at present members.

I close this Welcome Address with my personal thanks to Hon'ble Minister for his presence in the chair and to all others who have contributed in making this Conference a success.

Report of the Managing Committee for the year 1937-1938.

Hon'ble President, Ladies and Gentlemen,

The Managing Committee of the Madras Agricultural Students' Union have great pleasure in presenting their report for the year 1937 - 1938.

The period under report has been a very eventful year in the history of the Madras Presidency. Its beginning almost synchronised with the

introduction of Provincial Autonomy and the acceptance of office by the Congress Party on the 14th July 1937. Madras shares to-day with the other provinces the right of determining the future welfare of the millions in this country within the ambit of the Government of India Act, 1935.

The period under review has witnessed in Madras and elsewhere exceptionally heavy and important legislative activity which had tended to produce a silent revolution in the economic, social, cultural and political spheres, to ensure a better distribution of wealth and happiness, and to raise the status of India in the eyes of the powerful nations of the world. The amelioration of the village and the rural population received foremost attention at the hands of the new Government. The land revenue remission given in the various provinces, as well as the fifty percent reduction of grazing fees in Madras, show that the ministry were fully aware that the burden of taxation bears too heavily on certain sections of the community. An equitable adjustment and revision of taxation are to be brought about so as to do justice to the agriculturist, who is the back bone of the country.

The Madras Agriculturists' Debt Relief Act is a piece of legislation which has acted as a powerful lever in lifting up the agriculturist from the "Slough of Despond" into which he had been sinking, driven by agencies not friendly to him and by forces beyond his control. Its fundamental principles have been assailed in certain quarters. But its beneficial effects on the humble and voiceless tillers of the soil cannot be very seriously disputed, when one realises that, according to the report of Mr. W. R. Sathianathan I. C. S., the agriculturists' debt in this province stood at Rs. 200 crores in 1934, and that it has been mounting up at the rate of ten crores annually during the past few years, while their net income after paying the land revenue is reckoned at 6 to 7 crores only. This Act may, however, need some amendments and it is hoped that the Madras Legislature will not be slow in rectifying the defects observed in the course of the actual working of the Act.

The introduction of prohibition is another ameliorative measure which will tend in the long run to improve the condition of the rural population. What has not been possible for Republican America to accomplish during the past 70 years, and what the British Government was hesitant about in spite of the sympathetic utterances of her statesmen and the good will of the British nation, has been attempted to be solved, nay, has been solved without any fuss in this province. Though this involves the eventual extinction of four out of sixteen crores of rupees of revenue and the final drying up of the present fruitful source of income to the Government, its manifold advantages are beyond comparison.

The extension of the policy of state-aid to cottage industries which have been languishing for want of such support is another measure to improve the welfare of the rural population. The aid given to spinners this year is a fore runner, it is hoped, of what this Government and its

successors will do in future, in mitigating the disastrous effects of mass unemployment, and the enforced idleness of the agriculturist. While at this subject, the committee would like to state that the question of educated unemployed is also a very serious problem and has been so since 1931. The analysis of the census of the educated unemployed in six districts of this presidency, published recently by the Director of Industries, reveals a sorry state of affairs. Over 8000 in six districts, i.e. about 30,000 for the whole of the presidency is not a negligible figure. It is poor consolation to be told that the question of educated unemployment is a universal problem. But conditions in Western countries are different. We hope that the present Government will tackle this problem also in the near future.

The Union takes this opportunity to assure the ministry of their support, within the limited sphere of their activity, in all beneficent measures that they have initiated, and will initiate hereafter, and would like to suggest to them, even at the risk of repetition, the necessity for tackling the following problems also, as time permits:—

1. Resuscitation of forests and expansion of wooded areas.
2. Extension of irrigation projects inclusive of those relating to subterranean water supply.
3. Restoration and maintenance of irrigation tanks.
4. Provision for teaching practical agriculture wherever possible.
5. Standardisation of weights and measures.
6. Prevention of soil erosion.
7. Provision of funds for the expansion of seed supply.
8. Lowering of marketing charges.
9. Reduction of charges for electricity used in agricultural purposes.

Now coming closer to the sphere of activities with which we are more intimately connected, the year was eventful to the Agricultural Department in that it underwent some important changes. The Livestock section was transferred to the Veterinary Department. The number of Circles was reduced and the teaching and research work at the College and Institute have been reamalgamated. While we are one with the Government that some sort of reorganisation is necessary to co-ordinate research and teaching on the one hand, and bring the ryots nearer the department on the other, with a view to greater efficiency, we regret to state that the step has resulted in the retrenchment of a few posts. That our department is not over-equipped, will be evident, when compared with the conditions obtaining in other countries of the world. India being mainly an agricultural country whatever is done for the improvement of its agriculture will improve the welfare of its people. The agriculture in our country has already seen some changes and still more changes are necessary to keep pace with the development in other countries. We do not wish to go into details now on this aspect, but we assure the Government and the public, that every pie

spent is spent for the betterment of the ryot. We are constrained to lay some emphasis on this point, since we feel that there seems to be an impression in the minds of some people that this department can well afford to be axed without detriment to the public welfare.

College Day and Conference—1937 The celebration of the Annual College Day and the organisation of an Agricultural Conference is one of the main activities of the Union. The Twenty-sixth College Day and Conference was celebrated last year from the 22nd to 24th July. Dewan Bahadur S. E. Runganathan, Vice Chancellor of the Madras University presided over the Conference. A Symposium on rural reconstruction was organised for the Conference, in which many prominent workers in the field, official and non-official, participated. Besides the usual items such as sports, entertainments etc., an agricultural exhibition demonstrating the various activities of the department was also organised, for the benefit of the visitors and the public. A detailed account of the proceedings of the celebrations has already appeared in the July and August numbers of the Madras Agricultural Journal

The Madras Agricultural Journal—Besides celebrating the Annual College Day and conducting the Agricultural Conference, the all-the-year-activity of the Union is the publication of the Madras Agricultural Journal. We are glad to record that the journal continued to maintain the high standard associated with it. We are proud to note that research workers in departments and institutions outside our presidency, have come to feel that our Journal has a place among the scientific Journals of the world and are seeking its aid for the publication of the results of their research activities. It has on its exchange list a wide range of publications from many foreign countries.

Our new patron.—Sri Ramachandra Ananga Bhima Dev, the Raja Sahib of Bodokhemadi, Ganjam, has graciously become a patron of our Union during the year. We take this opportunity to convey to him our gratefulness for this tangible proof of his interest in the welfare of the land.

Honours.—We are glad to note that Mr. K. Ramiah, Paddy Specialist of our department and now the Director of the Institute of Plant Industry, Indore, and one of the past editors of the Journal, was made a Member of the British Empire in the recent Birthday Honours; the title of Dewan Bahadur was conferred on M. R. Ry. C. V. Venkataramana Ayyengar one of our patrons, and on Rao Bahadur D. Ananda Rao Garu, till recently the head of our department. We offer our hearty congratulations to these gentlemen on the well merited honours conferred on them for their services to the betterment of the country.

Academic Distinctions.—It gives us pleasure to learn that Messrs. N. Parthasarathy and N. Krishnaswami, two of our members, who have gone abroad for advanced studies have been awarded the Ph. D. Degree of the London University and the Keil University respectively. We also learn that Messrs P. Abraham and Uthaman, have been awarded the M. Sc. Degree of

the Madras University. We take this opportunity to record our congratulations to these young workers in the field of agriculture.

We are glad to learn that Rao Bahadur T. S. Venkataraman C. I. E., Imperial Sugarcane Expert, has been elected by the Indian Science Congress as its representative at the forthcoming meeting of the British Association for the Advancement of Science; and Mr. K. C. Naik, Superintendent, Fruit Research Station, Kodur, has been deputed, by the Imperial Council of Agricultural Research, to attend the International Horticultural Congress, to be held this year in Berlin. Both of them are members of our Union and we congratulate them on their well merited distinction.

Retirement. Since our last report Dewan Bahadur D. Ananda Rao Garu who was the head of our department and who helped us to a considerable extent in organising the Conference last year retired from service. He had the unique distinction of being the first student of the Madras Agricultural College to become the head of the Department of Agriculture in Madras. He has been intimately connected with the activities of the Union. Mr. Krishnamurthi Rao, Assistant Sugarcane expert, retired from service recently. He is one of the founder members of the Union and was one of its earliest secretaries. He has an abiding interest in the activities and welfare of the Union, and has been intimately connected with its management in various capacities. Rao Bahadur N. S. Kulandaswami Pillai, Deputy Director of Agriculture, who served the department in various capacities, also retired from service during the year. We wish them all long life, health and happiness.

Obituary. We record with regret the passing away of Mr. K. T. Bhandary, who was Assistant Director of Agriculture, Salem. He was an active member of the Union ever since its inception and has acted as its secretary also. Messrs. B. Dasappa Malli and C. A. S. Ramalinga Ayyar, two members of our department, also passed away during the year. We take this opportunity to convey our condolences to the members of the bereaved families.

Acknowledgements. It is now our pleasant duty to record our thanks to all who have helped the Union during the year. To Dewan Bahadur S. E. Runganathan, the Union owes a deep debt of gratitude for presiding over the Conference last year. To the various contributors of papers who participated in the symposium on Rural Reconstruction we tender our sincere thanks. To Mrs. A. C. Woodhouse who distributed the prizes for the sports, we record our grateful thanks. To Dewan Bahadur D. Ananda Rao Garu, the then Director of Agriculture, the Committee tender their heartfelt thanks for his keen interest in the Union and the invaluable help rendered by him in arranging for the Conference last year. To Mr. R. C. Broadfoot, who as President has been actively helping the Union in its various activities we tender our grateful thanks. Our grateful thanks are also due to all other ladies and gentlemen who in various capacities have helped the Union in the celebration of the College Day and Conference last year as well as in its every day activities during the year.

President's Opening Address.

It is indeed a pleasure to be associated with this annual function celebrated by the Madras Agricultural Students' Union. I am glad to learn that this Union completed its Silver Jubilee in 1936 and is now holding the 27th College Day and Conference.

I greatly appreciate the object of this Union which is to bring together the past students of the College including those who have gone out of the Saidapet College and the present students of this Institution. The Union was very small in the beginning and has progressed very much during the last 27 years. It has got its own buildings and has on its rolls officials and non-officials and students of the College. The College Day which it is celebrating is a valuable occasion affording an opportunity for discussions on important agricultural topics. Let me thank the Union again for the opportunity it has given me to be present here today.

The beginning of the Madras Agricultural Department can be traced to the foundation of a new model farm at Saidapet in the year 1864 since when it has marched from progress to progress until we find today a very important and well organised department with an educational institution fully equipped, a research institute second to none in importance and fame in India, a chain of district farms where local problems are tackled and a hierarchy of officials ranging from the Director of Agriculture down to the maistry who constitutes the effective link between the peasants and the departmental teachers, viz. Demonstrators. It does not, at this stage, require any elaborate explanation for justifying the need for a well equipped Department of Agriculture in any scheme of enlightened Government. If one has regard to the fact that more than 70 per cent of the population of the Province depend on Agriculture for its sustenance and well being, one can easily envisage the need for a well equipped Department of Agriculture with the primary object of improving the system of agriculture which is the chief occupation of the people. It is said that India has abundant natural resources and a very large labour force which can utilise those resources. We have thus got the two important essentials for economic activity but we find that these are not so closely used to the advantage of the general population with the result that there is inefficient and inadequate production. It is to remedy this defect that the Agricultural Department has been called into existence. As is often said, the Department is intended to make two blades grow where one is growing. I find that at these College Day functions, the entire activities of the Department in its various spheres are reviewed. This is no doubt an advantage since stock taking is usually one of the methods of oneself keeping up-to-date with the progress of one's business.

As a Minister in charge of Agriculture for now nearly a year, I have had opportunities of closely studying the work of the Department in its various aspects and I can confidently say that despite criticisms raised here and

there the work of the Department has been on the whole carried on on right lines with enthusiasm and earnestness on the part of the officers. During recent months many questions of importance connected with the administration of the department have come before the Government for examination. I may first refer to the question which has just now been settled viz., that relating to the working of the College. Teaching and research at the College had been separated and each kept, so to speak, in different compartments. Whether it was desirable that this arrangement should continue or whether any modification should be made in it was examined by Government and they have since decided that the two sections should be re-amalgamated, the teachers being brought again directly under the respective section heads, the future Principals being chosen from the senior officers, who in addition to teaching their own subjects would take over the administrative duties of a Principal. I do not claim here that this arrangement is the most perfect or the most widely adopted in other places, but there is advantage in the research officers being associated with the teaching of particular subjects. Research will better thrive when associated with teaching and the teachers would have opportunities to keep in close touch with what is going on in the research field.

Another matter of administrative importance to which we have had to give some thought was that relating to administrative divisions of the Department. It was till now divided into 8 territorial circles. The number of circles has now been reduced from 8 to 4. We have increased the number of District Officers. Of course in the pursuit for effecting savings, some individuals here and there in the Department may have been affected, but the administrative changes will, it is hoped, bring about a better disposition of staff with corresponding efficiency in work.

The work of the Agricultural Department has now ceased to be simply a question of paying attention to improve a crop here and introducing a new crop there or for fighting a disease here or combating a pest elsewhere. Its work under present conditions has gone beyond the original frame work and it has now to take a more extended vision of the economic conditions under which the ryot population is living. It is now called upon to advise on irrigation matters, on how to effectively combat famine conditions, how to improve marketing and how to develop rural industries for finding occupation during the idle hours of the peasants, etc. I do not propose to dwell on its efforts to improve the productivity on which it has been engaged since its inception. The research sections are well established and their work has been carried on on right lines. On the propaganda side, we have made considerable improvement with the recent addition of demonstrators which will enable the department to have one officer in each Taluk. We have got a large number of maistries under these demonstrators who, as I have already said, have filled a missing link in the connecting chain.

Agricultural education in Madras is well advanced. The courses of studies have changed from time to time but today the Degree course provides

a well rounded education both for those who want to pursue professional agriculture in their homes as well as for those who want to enter the ranks of Government. I would, however, here desire to utter a word of counsel to the students now in the college. I would ask them that they should not look forward to service under Government as the final goal of their agricultural studies. The object of the college would have been attained only if a large majority of the *alumni* turn back to their homes and apply the scientific training they have received at the college to the improvement of their own lands. For those who cannot afford the higher agricultural education, there are short courses in practical agriculture provided not only at Coimbatore but also in two other centres. Under agricultural education I would also mention the facilities provided for particular courses of study and recently short courses were introduced for sons of agriculturists who are anxious to improve their farming.

The charts that you see in the various research sections are the result of patient work and embody the continuous experience of the department. All these should be made available in the form of a cheap publication so that at public exhibitions copies of these may be used for demonstration and teaching.

In view of the great importance of fruits, the Government have sanctioned the establishment of two fruit nurseries, one in Taliparamba and the other in Kodur with the object of supplying reliable fruit plants of good parentage and giving the necessary encouragement and incentive for the extension of fruit cultivation in the Presidency.

I may also mention that early this year a scheme for the improvement of bee-keeping has been inaugurated in the Chittoor District. Apiaries will be organised in different localities and propaganda will be conducted to give advice and encouragement to ryots to keep hives and develop a useful cottage industry.

Under Livestock we have made an important move recently by transferring the Section from the Agricultural Department to the Veterinary Department. But I must make it clear that the step we have taken is no reflection on the former Department. The Government are perfectly aware that what has so far been done for the improvement of the livestock was done by the officers of the Agricultural Department and that with the limited funds they could secure in the competition between cattle and crop they did as best as they could. But the Government felt that if the rival claims were left to be adjudicated upon by one and the same department as Agriculture, Livestock was not likely to get as much attention as its growing importance deserved. This was the main reason for the transfer and the Government hope that the Veterinary Department will soon show that the transfer was justified.

Questions connected with marketing are claiming greater attention. It is not sufficient to produce unless the products raised in the country are properly distributed. The ryot will not derive the full benefit of either his

own toils or of the labours of the Department. An organisation specially devoted to secure a proper distribution of agricultural produce is therefore necessary and the Government have opened a marketing section under the Director. The most important work that now engages the attention of that section is the conduct of surveys of crops and other commodities. This work will be shortly over. The Government sanctioned early last year the appointment of a special Marketing Officer for development work. As we all know, development work, though essential is rather a tedious and difficult business. The most important part of development work is grading and in a country where this aspect of work has received very little attention, progress is likely to be slow. Anyhow a determined effort will be made to secure all the advantages of improved production by a properly organised system of marketing. Closely connected with marketing is the expedient which has been adopted in one case at Tiruppur for the buying and selling of the most important commercial crop viz., cotton. Regulated markets will be established for all other important crops. The proposal to establish one for groundnut in South Arcot and another for tobacco in Kistna and Guntur is under consideration. The advantages aimed at in the establishment of these regulated markets are the standardisation of transactions, safeguarding the interests of the grower by securing to him proper weighments and proper prices and fair dealing all round.

A great responsibility rests upon us who are at present custodians of the peasants' welfare. You know the tremendous difficulties in the way of progress for the peasant. He is still unable to put his own case properly. The agriculturists unlike those engaged in industries are unorganised and few help them. Prices are at their lowest level as the following table shows.

Index numbers of prices

Year.	Rice 2nd sort.	Cholam.	Cumbu.	Ragi.	Groundnut.	Cotton.	Jaggery.
1928-29	100	100	100	100	100	100	100
1929-30	90	84	86	86	85	85	125
1930-31	72	61	67	64	55	62	74
1931-32	60	55	54	57	63	58	65
1932-33	56	55	57	53	59	57	58
1933-34	48	45	51	48	39	58	53
1934-35	56	57	61	58	57	63	74
1935-36	59	59	64	62	58	62	64
1936-37	56	57	60	57	62	60	50

The middlemen's earnings in trade in agricultural products take off some share of what is really the peasants' due. Has any attempt been made by us to find out the costs of raising each crop like paddy, millets, cotton, sugarcane and groundnut and ascertain how much really goes into the coffers of the agriculturist? Is enough left to them in their homes to keep them out of want, not to speak of making them happy and comfortable? I trust this work will be taken up at once by the department in the pure spirit of scientific investigation.

The Agricultural Department, I am glad to observe, has not been averse to examine new ideas from whatever quarter they come. It is within your

knowledge that we sent one of our experts to study the technique of electro-culture. The subject requires careful study and observation and recording of results and though it would be presumptuous for me to say anything at present on the subject of electro-culture, it may have still some hidden possibilities which all of us are to explore with an unbiassed and scientific mind.

Yet another suggestion that I venture to make is that each one of us should attempt quantitative estimates of the work we do so as to satisfy ourselves and our conscience that we are doing our duty by the masses. It should not be a mere matter of Governmental routine but should be regarded with pride by every officer of the staff that he too, though not a politician, is laying by his humble quota of service for the nation.

The Managing Committee of the Students' Union has referred to two other aspects of administration which though they do not concern the Agricultural Department affect the well being of the ryots and they are

- (1) the introduction of the Madras Agriculturists Debt Relief Act, 1938; and
- (2) the introduction of prohibition in the Salem Dt.

In regard to the Debt Relief Act, I feel happy to note that you have referred to its ameliorative character. The Act was brought into force only towards the end of March last, but you will be glad to note that good progress has already been made in giving relief to indebted agriculturists. About 7,000 cases have already been disposed of under the Act.

In regard to the Prohibition Act, I do not desire at present to dwell at length on the beneficial character of the legislation. Several communiques have already been issued on the subject. I will content myself with taking this opportunity to disabuse the public mind in respect of one or two wrong impressions. It has been suggested in certain quarters that the Prohibition Act must fail to be effective by reason of the fact that tapping for sweet toddy is permitted under the Act and that permits are issued for the consumption of foreign liquor. I may assure you that control exercised over sweet toddy tapping is quite effective under the prohibition scheme and that permits for consumption of foreign liquor are granted to a limited number of persons of well known status, who are accustomed to the use of foreign liquor, to cover a specified quantity of such liquor. After all the number of such permits is 31 in a population of 25 lakhs. What you have seen and read must have convinced you of the great success of prohibition which is being extended to two other districts in October.

In concluding may I remind you that what we have achieved is little and what we have to look forward to is considerable. It is the silent unostentatious work of scientists, research workers and demonstrators like you that achieves much. You may not get into fame but your work will endure. If we will all remember that, we shall have met usefully today, for I take it, the principal object of our meeting is to give ourselves the eternal reminder that we shall aim at being the true servants of the people.

List of Winners of different Prizes for the year 1937—'38.

1. The Robertson Prize.	A. M. Bawker.
2. The Cloustoun Prize.	K. V. Srinivasan.
3. The Keess Prize.	A. M. Bawker.
4. The Sampson Memorial Prize.	P. Totadri.
5. The Dewan Babadur R. Ragnatha Rao Prize.	D. Narasinga Rao.
6. The D'Silva Memorial Prize.	A. Sankaram.
7. The Goschen Prize.	A. Seshachalapati Rao
8. The Anstead Prize.	R. V. Alagiriswami.
9. Rao Bahadur K. S. Venkatarama Ayyar Prize.	B. Narayana Reddi.
10. The Certificate Course Cup.	M. R. Nagaraja Rao.
11. The Old Cuddapah District Agricultural Association Prize. }	B. Narayana Reddi.
	N. Satyanarayana Reddi.
	Shaik Hussain.
12. Sir T. Vijayaraghavachariar Prize.	R. Viswanathan.
13. The M. K. Nambiar Prize.	R. Viswanathan.
14. The L. D. Swamikannu Memorial Prize.	P. Narayanan.

The Ramasastrulu—Munagala Endowment prize—This prize was awarded this year at the opening session of the Conference to Mr. K. S. Sankaram Pillai, L. Ag., an old boy of the college and a private farmer and business man at Guntur, for his paper "The Final Results of my Research on Growing, Curing and Marketing of Virginia Tobacco at Guntur".

Papers Read.

The following were the papers read:—

1. A much needed link in Agricultural dissemination work,
N. C. Tirumalachariar.
2. Rural exhibition, K. Unnikrishna Menon.
3. Green grass, T. Murari.
4. Electro-cultural methods adopted in Northern India for the improvement of crops, V. Ramanatha Ayyar.
5. Some aspects on the control of "Mahali" of the areca palm caused by *Phytophthora arecae*, K. M. Thomas and D. Marudharajan.
6. Virus diseases of plants, C. S. Krishnaswami.
7. The present status of beekeeping in Madras and suggestions for its development, M. C. Cherian and S. Ramachandran.
8. Tobacco stem as a useful source of nicotine for insecticidal purposes, M. C. Cherian and M. S. Kylasam.
9. Some experiences of the varying response of different millet and cotton strains to local areas in Cuddapah and Kurnool districts, R. Swami Rao and P. Subramaniam.
10. Eradication of Hariali in black cotton soil, M. Kalimuthu.
11. Bridging the gulf, G. Mahadevan.
12. Co-operation as the key to village reconstruction, N. Lakshmanan.

The Hon'ble Minister's Concluding Remarks.

Ladies and Gentlemen,

We are about to come to the close of a very useful and successful Conference. I think we are deeply indebted to those gentlemen who have taken the time, trouble and patience to bring before this Conference several papers which deal with agriculture in its various aspects. It is said, patient are those insects that build pearls in the deep sea. The silent and patient

work of the several Research students and teachers has brought very useful things which we were able to see in the Exhibition last evening. I must say that the money that has been spent either by the Provincial Government, or the subsidy that we have been drawing from the Imperial Council of Agricultural Research, was not being wasted.

Now there is the joint responsibility and the co-ordination among the various departments in this Province. There exists a close relationship with different officials of the various departments in this Province. I would here like to instance the working of prohibition in Salem. Whether an officer comes from the Development Department, Police or Forest, or from the Local Administration itself, he is bound to carry out the present dictates of the Government; and we see how happily things are going on there.

When I happened to see Dr. Katju, who holds the portfolio of Revenue and Agriculture in United Provinces, he told me that the Government are alive to the various attempts made by Dr. Nehru and that the Government is taking up that matter. As I have already pointed out in my speech, this Government keeps an unbiassed mind in the development and the results of electro-culture.

One of the members who read a paper on "Link in Agricultural Dissemination work" observed about my going to Simla in connection with the meeting of the Governing Body of the Imperial Council of Agricultural Research. With the various ministers that have come from the Congress Governments and others, we have discussed very useful things and come to some important decisions which have been dictated as resolutions. The first and foremost was that, as it is constituted, the Governing Body have no control over the officers of the Imperial Council of Agricultural Research, and that the entire control of the officers must be in the hands of the Governing Body. The second point, that was taken up, was about Finance. At present the Imperial Council of Agricultural Research set aside only 5 lakhs of Rupees for the various researches. At the same time you know that four lakhs are spent for the officers who are controlling these five lakhs of Rupees. A unanimous resolution requiring the Government to set aside at least 25 lakhs has been accepted by this important body, and even Sir Kunwar Jagadish Prasad—Chairman—has made a gesture that he will press upon the Government to increase the finances. If that comes about, I am sure our Government will be getting a bigger share for our research work. The third and most important point that we discussed was the subject, Mr. Mahadevan has taken up "Bridging the Gulf." Various opinions were advanced by the several ministers and other representatives, but we have not come to any decision in this matter, and the recommendations of Sir John Russell will again be a subject matter of discussion in that august Body at the next meeting. Mr. Mahadevan pointed out that our retired veterans must be able to settle down in villages and bring about the bridging of this gulf. But I have only to point out that we have only very few of such retired veterans, and as pointed out by Mr. Balakrishnan, if there are really

people who wish to improve the conditions of the agriculturists, I think the solution will be very near.

My friend, Mr. V. C. Palaniswami Gounder, touched upon the activities of the Forest Department in the matter of the collection of honey. As he himself knows, the present Government is not in a position to increase the strength of their officials for supervising the collection of minor products such as honey. However since there is no Forest Official present here, I may tell that this matter will receive my attention.

During the discussion and also during the reading of the various papers, observations were made that the Government have not come to the rescue of the agriculturist and several demands were made on the Government. I would request our Director of Agriculture to send a note embodying such requests to the Government and if they come with his recommendations, those matters will certainly receive the careful consideration of the present Government. (Loud Cheers.)

One word, my worthy friend Mr. Ramaswami Sivan, in his speech observed that our Prime Minister had not been sympathetic to his suggestions regarding the solution of the problem of the educated unemployed. And speaking further, he himself admitted what was the result of his offer to the graduates. It goes to show that our great Statesman is not unsympathetic in such matters. He has entirely placed his services at the altar of the Motherland, and whatever things he considers advantageous to the nation, he will be the first man to come forward to execute.

The one great cry is "Rural Reconstruction". Mahatma Gandhi, the great Mycologist, found the fungus that was eating on the vitals of the nation, and he says "Unless you improve the lot of the agriculturists, there is no solution for India". The mother earth has become barren. The cow which was yielding the beautiful milk has become very weak; and if we people wish to be strong and full of vigour we have to see that the mother cow is fully fed. So it does not fall on the shoulders of the agriculturist alone, but on everyone to see that the ryots are placed again in the proper form.

It was also stated during the discussion that 'human touch' is necessary. After enfranchising a good number of our citizens as a provision of the 1935 Act, a large number of ryots have become voters and those of them who have returned the present representatives to the Legislatures are keenly watching what these various Departments are doing and especially what the Agricultural Department is doing. I would appeal to all officers and those who are connected with the Agricultural Department, that they must rise above and show to the agriculturist that this department's activities are not in any way negligible.

In conclusion, I would like to thank you, gentlemen, for the very able way in which you have assisted this Conference by having a good form of discussion and helping the Committee of the Madras Agricultural Students'

Union to bring this Conference to an end. I personally feel that I am grateful not only to the Principal of the College but to all those connected with the Institution for having invited me, so that I may know what is really happening, and moreover this Conference and the discussions will form a refresher course to those of the students who have gone out of the College and who are serving in the Agricultural Department. I thank you again for giving me an opportunity to meet you.

A NOTE ON THE LOSS OF EMBRYO ON MILLING RAW AND PARBOILED RICES

By

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It has been generally supposed that parboiled rice has a greater nutritive value than raw rice and that even on polishing its antineuritic value is not lost considerably as with raw rice (McCarrison and Norris, 1924). Indeed, evidence has been presented to show that during parboiling, the endosperm absorbs vitamin B₁ at the expense of the germ and pericarp and that therefore milling does not result in the removal of the vitamin to the same extent as with untreated rice (Douglas, 1930; Aykroyd, 1932; Ghosh and Dutt, 1933 (Acton, Ghosh and Dutt, 1933; Codd and Peterkin, 1933). More recently, it has also been shown that parboiling results in a movement in part of the protein and mineral constituents originally present in the aleurone layers of the raw rice, into the interior towards the endosperm (Sreenivasan and Das Gupta, 1936). The extent to which parboiling preserves the essential nutritive constituents of rice on polishing depends however on the variety of rice and in particular on the thickness of its bran layer and the extent of parboiling (Subrahmanyan, Sreenivasan and Das Gupta, 1938). In commercial practice, only the coarser, the long-grained and the coloured varieties (which are generally classed as inferior) are used for parboiling. These have invariably thick bran layers (Ramiah, 1936) and contain more proteins and minerals than the white and smallgrained varieties (Sadasivan and Sreenivasan, unpublished data). Besides, since parboiling yields a coloured product even after some polishing and is largely consumed by the poorer classes, it is not generally polished to the same extent as raw rice. These two causes, together with the fact that parboiling toughens the grain and hence makes the removal of the pericarp more difficult, are primarily responsible for the richness of commercial samples of parboiled rice in regard to both proteins and minerals as compared with the samples of raw rice available on the market (Sreenivasan, 1938).

In contrast to the foregoing circumstances which render parboiled rice nutritively superior to raw rice, it has been suggested (Iliffe, 1928-29) that in the milling process parboiled rice loses its germ or embryo more easily than raw rice and that in consequence it becomes very much devoid of its nutritive value. This question of the relation of parboiling to the embryo content of rice grains appeared to merit further study and the present enquiry was therefore undertaken.

Experimental. A number of bazaar specimens of both raw and parboiled rices (some of them, well known varieties) were obtained. Practically all the samples were found to have been fairly well-washed, so that there

was none in which even a single grain had retained the embryo intact. From out of each sample, a number of whole grains were picked in lots of hundred and these were then separated into those containing a part at least of the germ intact and those from which the germ was entirely removed. Counts of these were taken and in Table I are given, with the name and nature of rice, the percentages of grains retaining at least a part of the embryo in grain.

TABLE I.

Examination of commercial rices for loss of germ on milling.

Raw Rice Specimens.		Parboiled Rice Specimens.	
Description of Rice	Number of grains per 100 with germ	Description of rice	Number of grains per 100 with germ
Kadur rice—red undermilled	58	Delhi Bhog—highly milled	16
Coimbatore Sanna—milled	36	Seetha Sala—highly milled	nil
Raj Bhog—milled	32	Bazar specimen—undermilled	35
Rama Sagara—highly milled	10	Big rice—under milled	42
Kempa Sanna—highly milled	10	Bazar specimen—milled	8
Bazar rice—hand pounded	51	Bazar red rice—milled	18
Delhi Bhog—highly milled	nil	Rangoon rice—milled	nil
Molagurukulu—highly milled	14	Bazar red rice—highly milled	16
Rangoon rice—highly milled	5	Nellore rice—milled	7
Jeeraga Sanna—milled	24	Guntur rice—milled	5

It may be seen from the above that there is not sufficient evidence to conclude that parboiled polished rice loses more of the embryo than raw rice. Under the ordinary conditions of polishing in mills, almost all the germ is completely removed together with the bran coats. This is particularly so with the specimens examined previously (Ilfie, *loc. cit.*). It is therefore difficult to know from bazar samples alone the extent to which they have been milled in the different cases, or the relative ease with which the germ in raw and parboiled rices is removed in the milling process. A better idea could however be obtained by comparing the same variety of rice, both raw and parboiled, and under comparable conditions of milling. Accordingly, specimens of raw and parboiled rice from the same variety (Adt. 11) were milled to the same extent in the hand polishing machine described elsewhere (Subrahmanyam *et al.*, *loc. cit.*). 100 g. lots of both the raw and parboiled rices were milled in the machine until 3, 5, 7, 10 and 15 per cents. respectively of the original weight of the rice were removed as polishings. The polishings in each case were passed through a 40 mesh sieve and from the coarse fractions, the germs were carefully separated by hand and then weighed. From the rice polished to different extents as above, a number of 100 g. lots were taken at random and these were sorted into those with germ (whole or in part) and those with no germ. In Table II are given the results.

TABLE II.
Extent of loss of germ on milling to different equal extents.

Per cent. polished	Raw Rice			Parboiled		
	Germ removed per cent. g.	Per cent. grains with germ by number.	Per cent. grains with germ by wt. g.	Germ removed per cent. g.	Per cent. grains with germ by number.	Per cent. grains with germ by wt. g.
3	0.5	44	46	0.5	48	48
5	0.8	25	23	0.8	29	22
7	1.1	15	15	1.0	16	15
10	1.2	5	4	1.2	3	4
15	1.2	nil	nil	1.3	nil	nil

It was observed that with parboiled rice, the germ was always removed from the bran layers in parts, whereas in raw rice, it was generally knocked off in entirety. The percentage weight of germ removed was about the same in both the cases with the same degree of milling. The number of grains retaining the germ at least in parts were somewhat higher in parboiled specimens. But when the weight of these over hundred original grains was determined, they were nearly the same in both the cases. Thus, whereas in raw rice the germ is usually lost in whole or not lost at all, in parboiled rice, it is invariably lost only in part. In other words, in raw rice fewer grains lose the germ but do so entirely, whereas in parboiled rice, a larger number of grains lose, but only in part.

It is probable that the greater breakages during milling of the embryo of parboiled rice grains is due to the changes in fat content as a result of parboiling. In the raw rice, the germ is very rich in oil and contains nearly one-fifth to one-sixth of the total rice oil. As a result of parboiling, the fat content of rice is reduced to a certain extent (cf. Table III, also Sreenivasan and Das Gupta, *loc. cit.*). Besides there is a considerable movement of the fat constituents from the germ into the bran

TABLE III.
Distribution of rice oil in the grain.

Variety.	PART OF GRAIN						Total extractive per cent. of grain.
	Germ.		Bran.		Endosperm.		
	Wt. per 100 g.	Ether extractives in g.	Wt. per 100 g.	Ether extractives in g.	Wt. per 100 g.	Ether extractives in g.	
Adt 11. Raw	1.2	0.38	9.3	1.52	89.5	0.36	2.26
„ Parboiled	1.3	0.31	9.2	1.60	89.5	0.32	2.23
Adt 7. Raw	1.3	0.42	14.5	1.07	84.2	0.48	1.97
„ Parboiled	1.2	0.34	14.2	1.09	84.6	0.46	1.89
Co 9. Raw	1.4	0.46	11.8	1.37	86.8	0.42	2.25
„ Parboiled	1.3	0.38	11.5	1.41	87.2	0.41	2.20
Adt 3. Raw	1.5	0.64	13.6	1.26	84.9	0.70	2.60
„ Parboiled	1.4	0.54	13.3	1.20	85.3	0.68	2.42

layers. This renders the former more brittle and consequently more liable to breakage during milling than the germ of raw rice which is comparatively soft and pliable on account of its higher fat content.

Summary. 1. During milling, parboiled rice does not lose the embryo to any greater extent than raw rice. In raw rices, the germ is usually removed as a whole; in parboiled rice, it is removed only in fractions.

2. The breakages of the embryo during milling of parboiled rice is due to its lower content of ether-extractives compared to the embryo of raw rice.

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A NOTE ON THE CRACK FILLING EXPERIMENT, AGRICULTURAL RESEARCH STATION, NANDYAL

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and

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In recent years great prominence has been given by research workers to the role of soil Physics in the production of crops. The relation between physical properties of soil and cropping power is now known to be of paramount importance.

In the taluks of Nandikottur, Nandyal, Koilkuntla and Siruvel in Kurnool district a number of different types of clay soil are to be found. In appearance some of these resemble typical heavy black soil land in Bellary district. The figures of mechanical and chemical analyses of typical dryland on the stations at Hagari and Nandyal which are shown below indicate their common properties.

TABLE I

Mechanical Analysis of Dryland soils at the Nandyal and Hagari Stations.
(International ammonia method).

Heads of Analysis.	NANDYAL		HAGARI	
	Surface, 0-1'	Subsoil. 1'-2'	Surface, 0-1'	Subsoil. 1'-2'
Clay	45.7	48.3	46.2	49.7
Silt	23.3	23.0	23.7	23.1
Fine sand	14.9	13.8	17.6	16.0
Coarse sand	8.2	7.8	5.1	5.5
Loss on solution, by difference.	7.9	7.1	7.4	5.7

The results are expressed as percentages on oven dry basis.

Hygroscopic capacities at different relative humidities :

Rel. H. %	10	25	50	75	90	98
Hagari	3.2	5.0	7.3	9.4	11.3	14.8
Nandyal	3.2	4.9	7.6	9.6	12.0	14.9

Chemical analysis of dry land soil samples (1 foot depth)
from the Hagari and Nandyal farms.

Heads of analysis.	Hagari.	Nandyal.
Moisture.	7.58	7.56
Loss on ignition.	5.05	4.44
Lime (CaO)	4.13	2.76
Magnesia (MgO).	0.53	1.46
Potash (K ₂ O).	0.42	0.49
Phosphoric acid total (P ₂ O ₅)	0.040	0.057
Available potash (K ₂ O)	0.035	0.033
Available phosphoric acid (P ₂ O ₅).	0.011	0.014
Nitrogen.	0.035	0.033
Carbon dioxide.	2.64	1.90
PH (average)	9.0	9.0

The rainfall, however, in these two areas varies widely, being on an average roughly 21" spread over 50 days in many places in Bellary district as compared with about 29" and 70 rainy days at Nandyal. In the Kundur valley in which Nandyal is situated the rainfall is earlier than in Bellary district.

In view of these differences one would expect to find some considerable variation between the yield of sorghum at Hagari, as compared with the field at Nandyal. Actually, the average per acre at the two stations is in the neighbourhood of 450 lb. and 200 lb. grain respectively. It seems reasonable to account for this in large measure by differences in the soil which are not revealed by analysis.

In contrast, if a comparison is made of the range in yield of cholam obtained on the station at Nandyal and on the same general type of land in the neighbourhood within seven miles the differences in some cases will be found to vary nearly 400 per cent. An examination of the manurial practice in these villages indicates that it varies little from that adopted on the farm. In view of the rainfall in quantity and distribution through a period of years being generally the same, one is compelled to conclude that the large differences in yield are due directly or indirectly to chemical or physical

soil properties or both. At the moment no figures of analyses are available for the purpose of comparison.

On the station at Nandyal and in the neighbourhood we are dealing with heavy clay soils having certain common physical properties. Two years ago a new line of investigation suggested itself which had for its purpose a change in the physical condition of the soil.

The black soils of the Ceded districts crack deeply during the hot weather which on the advent of rain is followed by rapid expansion. The contraction of the soil was taken advantage of to apply large quantities of groundnut husk which is available locally. In season 1937 the cracks in an area of land were filled completely by hand and in another case ordinary sand was used. The quantity applied in this way was 8.25 tons and 74.84 tons per acre respectively. The table given below illustrates the yield of cholam grain harvested per acre from treated and untreated land.

Strain N. 29/68

TABLE II.

Each set.

Area of Plot 1.0 cent.

CRACKS FILLING EXPERIMENT

Layout—Randomised Blocks.

Summary of results

Replications—12.

Grain yields in pounds per acre.

Variants—3.

Treatments and other details.	1936-37 Set.		Set I.		1937-38 Set II.		Set III.	
	Filling once every two years		Filling every year.		Filling every three years.		Filling every four years.	
	Grain lb.	% over control.	Grain lb.	% over control.	Grain lb.	% over control.	Grain lb.	% over control.
Control	550	100	808	100	802	100	739	100
Sand	594	108	790	98	789	93	780	106
Groundnut husk	888	161	1256	155	1186	148	1131	153
General mean	677	123	951	118	926	103	884	119
S. E. of treatment means	28	5.0	87.3	10.8	22.5	2.8	40.0	5.5
Whether significant by 'Z' test.	Yes.	P < .01	Yes.	P < .01	Yes	P < .01	Yes.	P < .01
Critical difference	80	15	246	30	64	8	113	16

It will be seen that in the first season the use of groundnut husk resulted in an increase in yield of 61 per cent and again in the following season there was an increment of 55 per cent over the control. Similarly, in the case of straw there were differences of 43 and 30 per cent.

During the past season cotton has been grown on plots treated with groundnut husk and sand in the previous year. Here again the differences in yield of kappas per acre in favour of the treatment is 21 and 18 per cent respectively. These figures indicate that the effect of applying groundnut husk persists at least into the second year and that cotton responds to such treatment.

At the end of the harvest season a beginning was made to examine a possible relation between soil moisture and cropping power. This work is being continued.

FUTURE OF THE INDIAN CITRUS INDUSTRY

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As in the case of most other Indian fruits, the Indian Citrus industry is full of anomalies intrinsic in any unorganised growth. To the outside world, India is not known as an important citrus producing country and has been classed as outside the 'ideal' citrus growing belt. Actually, however, India produces about as much citrus as Spain, the leading citrus exporting country in the world ; and from point of average production per acre is perhaps next in importance to only the United States of America, South Africa and perhaps one or two other countries. The Presidency of Madras alone has an area of over 20,000 acres, which is about equal to the pre-war citrus acreage in Palestine, one of the leading citrus producing countries. Almost the same area is believed to be under this fruit in the Bombay Presidency, Central Provinces, Coorg and Mysore. If to these are added the area in Assam, the Punjab, North-West Frontier Province, the United Provinces, Orissa and lower Himalayan ranges including Nepal and Sikkim, the total area is expected to be well over 100,000 acres which is certainly not an inconsiderable figure as compared to the chief citrus producing countries of the world.

Within this vast country, there are tracts where the average citrus production per acre can well withstand favourable comparison with the highly specialised producing centres in America and South Africa. In point of view of fruit quality, certain types of Indian citrus as the Malta and Sathgudi orange and Nagpur and Coorg Santras have been considered to be equal in quality to the best grown elsewhere. The cost of production in certain rain-fed tracts like Coorg and Agency tracts is perhaps the lowest in the world. Despite these advantages, it is a well-known fact that Indian citrus-growing is still in a primitive stage. Our production is very much below demand, and we have therefore to actually import certain varieties from abroad. The cost the consumer has to pay is far beyond his capacity in respect of certain varieties. There is a great preponderance of low grade fruits in citrus orchards and the defects in the disposal of these produce are so varied and numerous and the methods of orchard raising and maintenance are so demonstrably defective and unsystematised in a vast number of cases that, it is only a few growers who find this industry a paying proposition. The rapid fall in prices of citrus fruits in a few areas during the past decade shows that the industry is fast reaching a critical stage in its development.

It is not possible to stem the tide of depression by effecting an improvement of marketing alone, or in fact by any one single measure. In a crop like citrus, for the extension of which there is abundant scope, and which even in its present stage has furnished conclusive evidence of its being one

of the most remunerative of the Indian crops, but nevertheless is coming face to face with a growing competition from imported citrus fruits and by-products, it is essential to examine every aspect of the industry before one can offer any suggestion for the future.

A review of the present status of the citrus industry indicates that certain fruits like loose jacket oranges of the Santra type can be produced at a very low cost in Coorg, Agency tracts and Lower Palni hills of the South India, parts of Orissa and perhaps also in a small area in Khasi Hills of Assam. In some of these tracts particularly in South India, acid limes also grow with the minimum of care and, therefore, will be available at the lowest rates possible to the consumer. The Santras in Bombay and Central Provinces are much more expensive to grow, but the existence of better transport facilities makes them available in a larger area at competitive rates than those raised in the rainfed tracts. If better transport facilities are provided for the rainfed Santras and limes of South India, not only will it be possible to open up extensive areas under these fruits, but also to market these fruits at most favourable rates to the consumers. The recent tendency of the Nagpur Santra growers is to exploit the markets of South India, but it appears that Northern and Central Indian markets will be the most profitable marketing centres for the future of these fruits as well as of those produced in Orissa, while the South Indian markets will be of easier access and more profitable to the Coorg and Agency tract Santras. In regard to limes, South India at present possesses the largest area and it is doubtful if there is much room for expansion of the area under this fruit, unless a vigorous attempt is made to develop the lime beverage industry.

In regard to tight jacket oranges, the Madras Presidency, the Punjab and Bombay are the leading producing centres. The Malta and Blood Orange of the Punjab, North West Frontier Province, Western United Provinces and Sind, though of excellent quality, are very expensive to produce, with the high irrigation charges, high cost of protective measures against frosts, dust and hail storms. The Mosambi of the Bombay Presidency is fairly expensive and does not command a ready market except in the local and Hyderabad (Deccan) markets. The Batavian and Sathgudi oranges from seedling trees of South India are the least expensive to produce but so varied in quality that a thorough system of standardisation is necessary before it can meet the fancy of distant consumers. With the development of research in orchard maintenance and on standardisation of rootstock and scion varieties, it appears possible that South India will assume the premier position in the production of this type of orange. Not only there is very vast field for exploitation by the South Indian orange growers in their own Province but there is also a very great scope for marketing these oranges profitably in a great part of Central and Eastern India and even in some parts of Western and Northern India. Their low cost of production and excellence in quality should outweigh the high transportation charges to extra-provincial markets at least to a certain extent.

Another unique advantage that the Sathgudi and Batavian orange growers of South India enjoy is their ability to produce fruits practically all through the year. Although these oranges are largely marketed in two main seasons as those grown in Bombay and Central Provinces, the South Indian oranges can be had almost in every month in small quantities. The future of the Citrus industry in North and North West India suffers from the serious disability of a short seasonal production. Selection of choice, regular, off-season bearing, and high-yielding parent trees and extensive popularisation of their progenies after adequate tests should, therefore, prove a most profitable venue of work for the development of the South Indian Orange industry.

There appears to be very little future for grape-fruits, pomeloes, citrons, lemons, and other minor types of citrus in this country. Lime has established itself as an universally popular fruit but the production being already abundant, its future is not as bright as that of the Santras and tight jacket (sweet) oranges unless manufacture of cordials and squashes is extensively taken up. Introduction and trial of reputed varieties from abroad, selection of promising indigenous strains bearing in the regular and off-seasons, selection and standardisation of most promising types of rootstocks and finding out the most economic methods of orchard maintenance constitute the major problems of the citrus industry that await solution. As in the case of mangoes, future development of this industry should be based on the results of these above mentioned investigations and in due regard to the economy of production in the various tracts of India, and particularly in regard to the extension of the bearing season. Much room for improvement no doubt exists in the shape of provision of cold storage facilities and improved transport and marketing conditions, but these, by themselves will not stabilise the industry in its present stage nor will they ensure a sound and bright future. A rational plan of development will cover a number of distinct fields of work. In any case, it is impossible to point out the details of such work till the results of the All-India citrus Survey that is being conducted by the Imperial Council of Agricultural Research become available and the Provincial horticultural research workers put their heads together to work out a feasible and co-ordinated plan for the benefit of the Indian citrus industry.

EXTRACTS

Soil Losses from Indian Forest Grasslands and Farms. By R. MacLagan Gorrie, D. Sc., I. F. S.

Reliable run-off figures for forest and grassland are now available for the first time for Indian conditions. A technique of volumetric analysis of water and silt was worked out by the Puniab Irrigation Research Institute Staff at Madhopur in 1936 for a type of small isolated square of undisturbed soil $3\frac{1}{2}$ square feet in area. This method was described in the *Indian Forester* of December 1937, pp 839-846, and has been followed in forest plots at Nurpur in the Kangra district. A battery of six plots gave three pairs of grass, grass and shrubs, and bare soil on a slope of 1 in 4 on an eroded hillside of poor Siwalik

sandstone. The grass cover over all is distinctly poor, as it is recovering slowly from previous heavy grazing. The bare plots contained a little grass which has been kept clipped back with scissors. They thus simulate local grazing conditions to some extent, though we have not reproduced the destructive trampling action of cattle scrambling about on a greasy hillside; and the run-off from grazed areas must therefore be considerably heavier than the figures now reported. The results of the first monsoon's catch are as follows :

	Grass 80 % Cover Per cent.	Grass and shrubs 90 % cover Per cent.	Bare soil grass clipped every 3 days Per cent.
<i>Percentage of rain which ran off:</i>			
Out of a total of 46" on 32 days during July—October, 1937	7	5	25
Out of a total of 5½" in four hours. The heaviest single storm	2.2	1.7	6
<i>Weight of soil lost per acre :</i>			
Carried away on 32 wet days	3,500	3,900	18,500
Carried away by a single storm 5½"	260	307	3,511

These figures give one food for thought when it is realised that in a single storm the uncovered plots lost soil at the rate of 1½ tons per acre. This may be taken as a typical figure for all bare fallow fields in the foot-hills, except properly levelled rice land, and they are definitely conservative for the average village grazing lands which suffer from trampling of cattle. The ordinary grazing lands also suffer from the accumulative action of shallow gullies cutting the surface on long slopes, a phase of erosion which is of course not reproduced in our small square plots.

Many people have thought that the enormously heavy soil losses quoted from American measurements for ploughed fields are exaggerated and not applicable to Indian conditions. Measurements reported from the Bombay Dry Farming Research Station at Sholapur (chief investigator, Mr. N. V. Kanitkar) show a loss of 115 tons of soil per acre per annum from a field of jowar which is the most important combined grain and fodder crop in the Bombay Deccan. This loss was caused in a properly cultivated plot as the result of two very intense storms of 3.5 inches and 4.3 inches. The total rainfall of 28 inches is usually fairly well distributed and no such intense storms occurred during the previous year when measurements were started. The silt lost in these intense storms was particularly rich in valuable plant foods such as lime and potash, which were stolen by erosion, leaving the remaining soil much poorer. Of the various other kinds of plant cover tested, the amount of water lost in run-off was not strikingly different where weed or crop cover was dense. The amount of soil lost where the weeds had been preserved in fallow was just one two-hundredths of the jowar plot, while the clean fallow of bare but uncultivated ground yielded 25 tons of soil per acre or 22 per cent of the jowar plot's loss. These astonishingly heavy losses of silt were from very gently sloping ground, the average slope being 1½ per cent or 1 in 80, and the data are entirely reliable having been collected from thoroughly isolated plots.

A further point which this experiment has brought out is that good cultivation on a slight slope is no better than bad cultivation for saving soil unless it is protected by some form of bunding. The only sure way of reducing soil losses during exceptionally heavy storms is by contour ridging which is sufficiently deep to render each field a more or less self contained catchment unit, so that cumulative run off from a series of fields is prevented. The necessity for

such protection is brought out by subsequent figures for these same plots in 1937 so far unpublished but furnished in a letter from Mr. N. V. Kanitkar, who reports that this same jowar plot has lost a total in the year of 133 tons per acre. This included one storm in which 2.13" of rain in half an hour removed the huge amount of 52 tons of silt per acre. I am indebted to Mr. Kanitkar for permission to use these unpublished figures, but a fuller description of his experiments from his own pen would be of great interest to *Indian Forester* readers. (*The Indian Forester* Vol. LXIV, No 6, June 1938).

The Propagation of the Mango in Jaffna. By W R. C. Paul and S. C. Guneratnam.

A method of budding mangoes in the nursery for which success is claimed has been devised at the Farm School, Jaffna, Ceylon. The stocks used are seedlings, 6 months to 1 year old, and budding is done at a height of about 10 inches from the ground, at a point where the bark is brownish or greyish in colour, the most suitable time being during a growth flush. To prepare the stock two parallel vertical cuts in the bark $1\frac{1}{2}$ —2 inches long are joined at the top by a horizontal cut. The flap thus cut is pulled gently down, leaving a patch of the cambium surface exposed. The bud, taken from the current season's growth and with the petiole removed except for a stub of $\frac{1}{10}$ inch is cut so that it remains in the centre of a shield about 1 — $1\frac{1}{2}$ inch in length and of an area slightly less than that of the prepared patch. The cut is made so that a wedge of wood remains underneath the shield. The shield is then placed in the centre of the patch on the stock plant in such a manner that its sides or extremities do not touch the edges of the patch. The flap is now pulled up over the bud, the whole being secured with waxed tape. In hot weather a bud is protected by a strip of dry plantain sheath 3×5 in. tied on the stock above and below. During wet weather the bud is covered with oil paper. After 2—3 weeks the tape is unwound and, if the bud is still green, it has probably united. The plantain sheath is replaced. A week later this covering is removed and the stock is ringbarked $1\frac{1}{2}$ —2 in. above the bud, the final cutting back of the stock taking place when the bud has grown to a length of 3 or 4 in.—(*Imp. Bur. of Fruit Prod., Hort. Abs. Vol. VII, No. 3. p. 260, 1937.* From *Tropical Agriculture*, Volume XV, No. 6).

Agricultural Jottings.

THE DREADED 'MAHALI'. A Timely Warning to Areca growers

Every arecanut grower in South Kanara and Malabar is now familiar with the *Mahali* or *Koleroga* disease of arecanuts and what it means to him. It is needless to stress on the danger of inaction which has often landed cultivators on the verge of ruin. When the disease broke out during the 1936 monsoon, many growers were caught unawares at a period when they were not prepared. Many were without sprayers and could not get them either for love or money. Those who managed to get sprayers from distant places found that the bulk of their crop had been lost in the space of a few days in which they managed to obtain sprayers and chemicals. During 1937, however, owing to the strenuous propaganda work done by the Agricultural Department and the costly lesson which growers learnt for themselves, the results were different. There was general preparedness all round. Large quantities of sprayers and chemicals were available in the district and well over 90% of the area in the important arecanut centres was sprayed. The results were convincing. Despite heavy and continuous rain fall which were favourable for an equally bad or worse outbreak of the disease, most of the crop was saved.

Now that the spraying season is approaching, areca growers in South Kanara and Malabar are again warned against any relaxation in their efforts. They

should realise that the normal yield which they obtained from the last crop was entirely due to the protection afforded by timely spraying. It is extremely dangerous to gamble with the weather in the hope that the disease may not appear this year or that spraying can be done when it appears. Special field experiments conducted by the department last season showed conclusively that the time of spraying is very important and that two sprays are immensely better than a single spray. The first spray should be given before the monsoon sets in and the second about six weeks later. Once the disease breaks out in a garden, any amount of hurried action can save only a portion of the crop.

All growers should now provide themselves with sufficient number of sprayers and enough chemicals for their immediate needs. Old sprayers should be tested, worn out parts repaired or replaced and kept in good working order. Experiments conducted during the last season have shown that casein and vegetable oils are good spreaders suitable for addition to Bordeaux mixture. Either of these can be used in place of the resin-soda adhesive which was largely used in former years.

Leaflets on the preparation and correct application of the protective mixture and any other information required can be had from the Agricultural Demonstrators in each taluk or directly from the Deputy Director of Agriculture, Tellicherry.

MARKETING SURVEY OF WHEAT IN MADRAS PRESIDENCY

Wheat is not of much importance in cultivation in this presidency. Madras is importing from other provinces annually about 88% of its wheat requirements and the whole of the wheat flour required. The total area of wheat in India based on the average of the seasons 1925--26 to 1934--35 is 33.2 million acres. This presidency represented only 0.05 per cent of the total wheat area in British India and Indian States together during 1934--35. In 1925--26 the area under wheat in this presidency was 24,122 acres. Since then the cultivation of wheat has gone down considerably. In 1936--37 there were only 14,140 acres under wheat, representing roughly only 0.045 per cent of the total cropped area.

Among the wheat growing tracts in India the Punjab accounts for almost two-fifths of the total area under wheat in British India and over one-fourth of the All-India area. The averages of the Punjab and the United Provinces together (excluding the Indian States within their borders) represented more than two-thirds of the wheat area in British India and one-half of the All-India acreage.

The main tracts growing wheat in this presidency are the districts of Bellary, Anantapur, the Nilgiris, Vizagapatam, Kurnool, Salem and Madura. These districts, between them, represented 89 per cent of the total wheat area in the Presidency.

In Bellary, Kurnool and Guntur districts the crop is raised without irrigation in the winter season—sown in October-November and harvested in February-March. The bulk of the wheat crop in Anantapur district is under well irrigation and cultivated almost in the same period. In Vizagapatam, the Nilgiris, Madura and Salem its cultivation is confined to the hill slopes only. The crop is not remunerative in this presidency compared with other cereals like Cholam. Wheat straw has no fodder value. There is often fodder scarcity in areas like the Ceded districts and consequently wheat does not find favour with the growers. The grains do not set properly in places where there is not sufficient wintering. The crop is susceptible to "Rust" and crop failures are common in the case of wheat. There is, therefore, no incentive for the extension of its cultivation. The trend of acreage is definitely on the decline and there has been a reduction of area by 31% during the period 1930--35. The average yield of grain per acre is about 350 lbs. as against 636 lbs. for the whole of India and 1146 lbs. for Europe.

The average annual production in this presidency is estimated at about 2600 tons mostly of *Triticum Vulgare* and in a small measure of "spelt" wheat (*Triticum Dicoccum*) from Anantapur district.

There is considerable import of wheat and wheat flour into this presidency both by sea and rail from the other provinces in India.

Sea-borne imports of wheat and wheat flour.

	Wheat tons.	Wheat Flour tons.	Total wheat and wheat flour tons.	Total value in lakhs of rupees.
1930—31	6,655	29,336	35,991	57.24
31—32	6 811	30,780	37,591	42.67
32—33	7,101	33,109	40,210	49.08
33—34	7,551	33,245	40,786	49.04
34—35	8,331	38,655	46,986	52.42

There has been a steady increase in the sea-borne imports of wheat and wheat flour since 1930—31. The imports of wheat and wheat flour by rail during 1934—35 amounted to 9,740 tons and 4,122 tons respectively. The total imports of wheat and flour into the presidency in 1934—35 by sea and rail amounted to 60,838 tons (18,062 tons of wheat and 42,776 tons flour) valued at about Rs. 68.11 lakhs. The net imports of wheat and flour to Madras in 1934—35 was 17,461 tons and 40,499 tons respectively valued at about 65 lakhs of rupees.

Bombay and Sind together represented 62.1 per cent of the total wheat imports into the presidency. Fairly large quantities are also being received by rail from Central Provinces, Central India and Nizam's States. Sind supplies the major share of the imports of wheat flour. Of the total arrivals of wheat flour 42,776 tons in 1934—35, 37,555 tons were received from Sind or 87.8 per cent of the total. Bombay supplied 1,278 tons while Bengal contributed 1239 tons. The Mysore State is a net importer of wheat flour from Madras. In 1934—35 the state supplied 1712 tons of flour while it received back 2164 tons from Madras. Of the total imports of flour 90.6% arrived by sea and the balance by rail. Annually about 1600 tons of wheat and about 1900 tons of wheat flour are being reexported by rail from this presidency to other provinces and States. There is generally much confusion in the names of imported wheat and the same terms may indicate different qualities of wheat in different places. There are three types of wheat in the market according to the purposes for which they are intended, (1) Arisi gothi, (2) Ravai gothi, (3) Mavu or flour gothi. In the city of Madras the main types of wheat sold are samba, Khandwa, thodi and gundu. Samba wheat is cooked as it is and eaten in place of rice and hence known as arisi gothi. Khandwa is large bold grained, hard, light amber coloured wheat and is generally made into ravai and therefore called Ravai gothi. 'Thodi' and 'Gundu' are soft types imported from the Punjab through Karachi and they are used for 'Mavu' or flour and hence they are known as Mavu gothi. 'Thodi' is also known as white Pissi. Imported wheat contains a mixture of red and white types in varying proportions.

In this presidency, there is no large scale production of flour. The major requirements of wheat flour of all sorts are met by imports. There are four main types of imported flour. Household flour and Maida, without any admixture of bran, are used chiefly for sweetmeats and vermicelli. Two brands of wheat flour (Household and superfine) are used for making leavened bread. Superfine flour is considered superior and gives soft bread. In well recognized bakeries the proportion of superfine to household is two-thirds to one-third. Bread made of household flour only is hard and becomes very sour quickly. In small bakeries bread is made either purely of household flour or with only a small addition of

10 to 15% of superfine flour. *Attah* locally known as *Nattumavu*, is brown in colour as it is mixed with bran and is generally used for making *chapathi*. *Ravai* and *sojji* are the other two types of powdered wheat. *Ravai* is of finer grains and is used for *uppumavu*, sweet meats and vermicelli. Vermicelli prepared out of *ravai* is considered superior to that made of *maida*. Bangalore *ravai* is in special demand at Madras as it is made of Pandaripur hard wheat.

The distribution of wheat and wheat flour is usually done from the ports of Madras, Calicut, Tuticorin, and Cochin into the different centres of the Presidency and outside and also from Bangalore. There are special reduced rates for wagon loads from many wheat centres in the Punjab and North India to Madras and Bangalore and these are responsible for the importance of these two centres for distribution. The largest consuming centres for wheat in this presidency are Madras City (49,672 maunds net), Bellary (29,471), Coimbatore (24,846), Calicut (14,739), Nandyal (12,101), and Katpadi (10,113). The largest consuming centres for wheat flour were: Madras City (246,216 maunds net), Tuticorin (173,839 maunds net), Calicut (82,385 maunds), Cochin (90,541 maunds), Mangalore (26,345 maunds).

As nearly 96 per cent of the requirements of wheat and flour of the Province are imported, the prices depend on those prevailing at the original source of supply. Emmer or Samba wheat imported from Bijapur, Pandaripur, Gadag and other parts of South Bombay being harder and more glutinous is considered superior to Karachi wheat and the former always sells at a premium. The trend of prices for "Gundu" wheat at Madras ranged from Rs. 13-8-0 to Rs. 12 per bag of 196 lbs. during 1930, crashed to Rs. 8 during 1931 and stood at a level of Rs. 9 during the succeeding years. Prices are generally higher in October, November when the stocks are at their lowest, than in March-April. The price of *ravai* per bag of 196 lbs. at Madras ranged from Rs. 15 to Rs. 17 in 1930, Rs. 14 in 1931 and 1933 and about Rs. 12-8-0 in 1934-35. There was thus a general decline in prices since 1931.

Since the average area cultivated by any individual is very often less than half of an acre the produce is disposed of mostly by the Farmers themselves directly to consumers at the weekly shandies in their own or neighbouring villages. The wholesale merchants and commission agents deal mostly in imported wheat.

There are a large number of small bakeries and makers of indigenous biscuits, buns, etc. Very few of these bakeries are operating under modern hygienic conditions. The flour required for making "roti" or leavened bread is kneaded by hand and the bread is made under primitive conditions often in insanitary surroundings. Small bakeries and tea shops use inferior flour, while a few high class bakeries use superior white flour. The quality of bread varies according to the grade of flour used, temperature of the oven and the time given to kneading. The poor quality of the bread and its tendency to develop sour flavour easily is due largely to the yeast used. Hops imported from England and Germany are used by better class bakeries in the preparation of yeast. The smaller establishments use toddy the fermented juice of coconut or palmyra. The method of preparing yeast from hops is considered as a trade secret, and consists in boiling hops with potatoes and treating the filtered liquid with a starter.

Being a predominantly imported crop, improvements on the side of marketing from a producer's point of view are essentially concerned with provinces in Northern India. The marketing section has fixed up a standard contract for future transactions in wheat for all chief markets in India and the regulation and registration of future markets are also being taken up. The standardisation of weights is absolutely necessary for wheat, as well as other commercial food

grains, and arrangements should be made for compulsory testing of weights and measures as is being done at Bombay. The quality of Indian loaf bread can be improved by the use of better yeast and flour, and there is scope for building up a trade in Macaroni with some fine Indian wheats.

MARKETING SURVEY OF CATTLE IN THE MADRAS PRESIDENCY

As per census figures of 1934—35, the total number of bovine animals, comprising oxen and buffaloes in the Madras Presidency was 24·61 millions, the corresponding figure for the whole of India being 230 millions. Amongst the provinces, the United Provinces has the largest number of bovine animals namely 32·47 millions, Bengal comes next with 25·29 millions and Madras occupies the third place (24·61 millions) followed by Bihar and Orissa 21·31 millions, Punjab 15·84 millions, Central Provinces and Berar 13·84 millions and Bombay 12·60 millions. In Madras, about 28% of the cattle are buffaloes and 72% oxen.

The following shows the proportion of cattle population in some of the foreign countries, as compared to that of India which is taken as 100.

India	...	...	100
United States of America	...	...	29
Argentine	...	...	13
Germany	...	...	9
Soviet Russia	...	...	25
France	...	...	7
Australia	...	...	6
Canada	...	...	4
Great Britain and Northern Ireland	...	...	4
New Zealand	...	...	2
Netherlands	...	...	1

While our cattle population is numerically strong, they are very poor specimens of the bovine species in the whole world. They are as a rule weak and puny and inefficient for agricultural work and for milk production.

The cattle population of the Madras Presidency remained almost stationary at about 22 million head of cattle during the decade 1920—30 while an increase of 9·6 per cent was noticeable in 1934—35 as compared to the previous census in 1929—30. The increase was the natural outcome of excess of births over deaths while the uniformity in the number of stock in previous years was attributable to heavy mortality as a result of the outbreak of cattle diseases thereby counterbalancing the increases due to births.

The cattle population of the presidency may be regarded as in excess of our demand at present, provided they are efficient. The draught animals intended mainly for agricultural operations number about 4·35 million pairs and the land cultivated comes to 7·5 acres per pair as against 10 acres in 1920.

The number of milch stock is 6·68 millions, comprising of 4·28 million cows and 2·40 million shebuffaloes. On the basis of population there is one milk animal for every 7 persons as compared to one for every fourteen persons for England. In spite of this, our *Per Capita* milk supply is low.

Imports. All the districts except the West Coast and deltaic tracts are practically self-supporting so far as light draught animals are concerned. But the presidency draws a regular supply especially of superior draught cattle from Mysore, Bengal, Hyderabad and Central Provinces, the annual imports amounting to 80,000 head of which 57,000 are accounted by Mysore, while 10,000 male buffaloes of "Kimmidi" breed are imported from Bengal.

Exports. The export of cattle from the province is negligible as the number rarely exceeds 5000 per annum. Prior to 1922 Ongole cattle used to be exported to foreign countries such as Brazil, Java &c. As it was then feared that the breed would in course of time be depleted of its fine animals the Madras Government in 1922 passed orders prohibiting the export of cattle of Ongole breed. Subsequently in 1930 an amendment was issued permitting Ongole bulls and bullocks (but not the female stock) to be exported under licence granted by the Director of Agriculture, but there has been no improvement in the exports since then. The high prices offered by the foreign buyers acted as a great stimulant to the cattle breeders in Ongole tract, and with the loss of such foreign markets the enthusiasm of the producers also waned.

Prices. Prices of cattle, it is noticed, not only failed to improve after the depression years but continued to decline till 1935, the low level of which has been maintaining itself ever since without perceptible fluctuations. The low prices of cattle now ruling have cut out the chances of cattle breeding as a paying proposition. A pair of work cattle which sold for Rs. 300 in pre-depression period (1928-29) can hardly get Rs. 200 at present.

Marketing. The existence of a network of annual fairs and weekly shandies is an outstanding feature of cattle marketing in this province. Nearly a million cattle comprising mainly of superior work bullocks are assembled and distributed in fairs which number about 60. The weekly cattle markets of which there are over 200 in the province roughly account for the sale of 2½ million animals per annum. These latter deal mostly in poor type of animals as compared to the fine cattle that pass through annual fairs. The draft breeds—Kangayams and Mysore, are the chief attraction of the markets in southern districts of the presidency. The cattle traders of the province frequently visit Mysore in order to purchase the Mysore breed and assemble them in the presidency fairs. The sales are effected through the medium of brokers after a good deal of higgling and bargaining. The number of brokers in recent years has grown to such an extent that in some markets, it has been found necessary to license them. The brokerage charged on an animal ranges from 8 annas to Rs. 2 according to the ability of the broker.

Transport. The movements of cattle take place mainly by road, the traffic by rail being negligible as the facilities offered do not appear to be adequate. The iron wagons, high freight and lack of watering and feeding arrangements are some of the drawbacks. About 10,000 young bulls are annually moved by road from Ongole area (Guntur, Nellore and Kistna districts) to the Ceded districts. From the same tract an equal number of milch cows and buffaloes go by rail to Madras city. The majority of these cows when they become dry used to be slaughtered in Madras, but now due to the efforts of the Marketing Board, a substantial reduction in freight on the transport of dry cows has been obtained with the result that most of the dry cows are now returning from the city to their original home for their further breeding and re-export to Madras.

Suggestions for improvements. The marketing arrangements to be effective need a thorough overhauling of the existing systems and the substitution of organized cattle markets. The introduction of auction sale of cattle at least in a few important cattle markets would be a right step in the direction of improving the sale. The provision of sufficient and separate accommodation for cattle with sheds for different types of animals, together with feeding and watering facilities are quite essential at the existing markets. At present hardly one-tenth of the market fees is spent in providing facilities for the markets. A properly arranged system of grading of animals according to age and type would go a long way in the marketing improvement.

Side by side with these improvements substantial changes in the existing management of cattle have to be introduced to prevent not only the further deterioration in the quality of cattle but also to effect a general improvement of livestock. What is more important at present is raising the standard of quality rather than increasing the number. A planned distribution of pedigree bulls to suit the needs of different localities and different breeds of animals requires immediate attention. Castration of all useless bulls is another direction in which improvement could be effected. This ought to be supplemented by greater care of animals and proper feeding. Raising of fodder crops, preparation of silage wherever facilities exist and the cutting and storage of hill grass might be adopted. Better management of grazing areas is desirable, and cheaper facilities now being given by Government should be fully availed of. The improvement of cattle by breeding offers greater scope with the indigenous breeds than by recourse to cross breeding. For improvement of milch stock, dry cows and cows in calf should receive greater attention than at present.

Review.

"Potash Deficiency Symptoms": Oskar Eckstein, A. Bruno, and J. W. Turrentine: 2nd Edition, 1937.

The second edition of "Potash Deficiency Symptoms" by Eckstein, Bruno and Turrentine is a most useful publication excellently got up and illustrated. The first part gives a clear account of the general symptoms of Potash deficiency as it affects the plant and its structure and appearance. The second part deals with Potash deficiency in various cultivated crops for diagnostic purposes. This follows a section containing 54 coloured illustrations of potash deficiency in plants.

The publication is well documented and should be of great use to the practical farmers and students of Agriculture.

P. V. Ramiah,

Correspondence.

To The Editor, The Madras Agricultural Journal.

Dear Sir,

In some places there is a practice of cutting away the wings of the Queen bee and then letting her in the artificial hive so that she may not desert the hive by her power of flight. This sort of a thing, I think, is not practised in and round about Coimbatore. I shall be greatly thankful to you if you can get answers for the following queries and publish them in your valuable journal:—

1. Will the Queen bee be able to perform her usual duties if she is deprived of her wings?
2. Will the workers tolerate the presence of such a Queen and carry on their allotted duties?
3. Is this sort of an operation advisable on the part of an apiculturist?

19--6--'38.

R. Viswanath.

REPLY

Sir,

This treatment is not advocated by us. We tried it to prevent newly hived colonies from deserting and it had hardly any effect on the bees. In most cases, the bees swarmed out even after the treatment; the disabled queen also crawling

out along with the mass of bees, only to drop down and get devoured by some of its common enemies such as the black ant, lizard, etc. The better method to avert the tendency would be to fit up a piece of a 'queen excluder' at the entrance of the newly hived colonies for about a month or so. Some attention should also be paid to other factors such as wax moth trouble, pasturage scarcity, inconvenient location, etc., that generally cause such wholesale desertion.

As regards queries 1 and 2, the clipping of the wings does not in any way affect the usual activities of the queen or her relationship with the other members of the colony.

Coimbatore, }
22-6-'38. }

M. C. Cherian,
Government Entomologist.

To The Editor, M. A. Journal, Lawley Road P. O.

Dear Sir,

I have read with interest in your issue of last month. Mr. Neelakandan's note regarding the use of paraffin wax with kerosene to paint charts, papers etc. to check the silver fish pest. I would suggest to him as an alternative the use of paraffin-naphthalene solution as is generally done by entomologists to keep insect store boxes, etc., from the ravages of this and similar pests. Instead of kerosene oil, powdered naphthalene may be mixed with paraffin wax (of high melting point) in the proportion of 1 to 3 and the solution brushed.

4th July 1938.

T. V. R.

Crop and Trade Reports.

Groundnut—1938—Summer and early crops—Condition report. Sowings of the summer crop of groundnut and of the early crop in the districts of Salem and Coimbatore are generally satisfactory.

2. Harvest of the summer crop of groundnut has commenced in parts. The yield is expected to be generally normal. The early crop of groundnut in Coimbatore has been affected by drought to some extent.

3. The wholesale price of groundnut (shelled) per imperial maund of 82½ lb. (equivalent to 3,200 tolas) as reported from important market centres on 11th July 1938 was Rs. 4-10-0 in Cuddalore, Rs. 4-5-0 in Vizagapatam, Rs. 4-3-0 in Guntur, Rs. 4-2-0 in Vizianagaram, Rs. 3-12-0 in Anantapur, Cuddapah, and Vellore, Rs. 3-9-0 in Tadpatri, Rs. 3-8-0 in Nandyal, Rs. 3-7-0 in Hindupur, Rs. 3-6-0 in Adoni and Rs. 3-5-0 in Bellary. When compared with the prices published in the last report i. e., those which prevailed on 4th April 1938, these prices reveal a rise of about 18 per cent. in Cuddapah, 17 per cent. in Nandyal, 14 per cent. in Tadpatri, 13 per cent. in Anantapur and Vellore, 12 per cent. in Guntur, 10 per cent. in Vizianagaram, Bellary and Hindupur and 8 per cent. in Adoni. (*Director of Industries, Madras*).

Cotton Raw, in the Madras Presidency. The receipts of loose cotton at presses and spinning mills in the Madras Presidency from 1st February 1938 to 29th July 1938 amounted to 348,333 bales of 400 lb. lint as against an estimate of 488,600 bales of the total crop of 1937-38. The receipts in the corresponding period of the previous year were 387,555 bales 281,611 bales mainly of pressed cotton were received at spinning mills and 43,545 bales were exported by sea while 61,453 bales were imported by sea mainly from Karachi and Bombay.

(*Director of Agriculture, Madras*).

THE MADRAS AGRICULTURAL STUDENTS' UNION.

The Annual General Body meeting of the Union was held on Sunday, the 24th July 1938 with Mr. R. C. Broadfoot, Principal and *Ex-officio* President of the Union in the chair. 136 members, including 76 students, were present. The minutes of the previous meeting were read and adopted. The Annual Report, including the statement of accounts for the year 1937—1938, was then presented by the Secretary. Before adopting the Annual Report, Mr. V. Muthuswami Ayyar proposed the following resolution, which was unanimously passed, all members standing. "This meeting of the General Body of the Madras Agricultural Students' Union deplores the loss of Mr. K. T. Bhandari, one of its most devoted, loyal and trusted members, and requests the Committee to communicate this resolution to the bereaved members of his family and his brother Mr. K. G. S. Bhandari."

The Annual Report for 1937-38, the Auditors' Report for 1937-38 and the Budget for 1938-39 were then adopted.

The following resolution moved by Mr. T. Varahalu was then taken up for consideration.

"Proposed that the system of collecting even the half cost, incurred for inserting charts and photographs etc., in the journal, from the contributors of articles to the *Madras Agricultural Journal*, be discontinued, and that the whole cost for the same might be met by the authorities running the Journal."

The President explained that the levy of the half cost for blocks from contributors is necessitated by the circumstances under which the Journal is run. He suggested that it is better that the Managing Committee use their discretion in cases where such levy acts as a deterrent to the contribution of articles for publication. Mr. Varahalu, thereupon, withdrew his resolution.

Another resolution, which was given notice of, the day previous to the meeting, by a student member, D Narayana Rao, to amend the second para under Rule 6 (Election of office bearers) was ruled out on a point of order raised by Mr. V. Muthuswami Ayyar.

The following office bearers for 1938-39 were then elected:—

Council: *Moffusil Vice-Presidents:* Messrs. K. Gopalakrishna Raju, M. U. Vellodi and R. Swami Rao. *Moffusil members:* Messrs. K. G. S. Bhandari, K. Kunhikannan Nambiar, V. N. Subbanachar, and S. N. Venkataraman, and *Resident members:* Rao Sahib T. V. Rajagopalachariar, Rao Sahib V. Muthuswami Iyer and Rao Bahadur S. Sundararaman.

Managing Committee: *Resident Vice-President:* Mr. K. Unnikrishna Menon; *Editor:* Dr. J. S. Patel; *Secretary:* Mr. P. A. Venkateswaran; *Manager:* Mr. M. Bhavani Shanker Rao; *Treasurer:* Mr. A. H. Subramania Sarma, and *Members:* Messrs. C. S. Krishnaswami, M. A. Sankara Ayyar and K. Sanjeeva Shetty.

Editorial Board: Editor, Secretary, Manager and Messrs. M. C. Cherian, C. Ramaswami and K. M. Thomas.

Election of the student representatives for the council, the Managing Committee and the Editorial Board did not take place at the meeting.

The President, in winding up the proceedings, expressed his thanks to the various sub-committees that helped in the successful celebration of the College Day and Conference this year. Mr. S. M. Kalyanaraman proposed a vote of thanks for the retiring committee. Mr. V. Ramanatha Ayyar, the Vice-President, thanked the President for his help and guidance in the management of the affairs, of the Union.

Report of the Managing Committee for the year 1937—1938.

(Presented to the General Body).

The Managing Committee beg to present the following report of the activities of the Union for the year 1937—38.

Membership. The strength of the Union as it stood on 31st May 1938 was 460 (as against 450 last year) including 113 student members. We have again to record with regret that many members of the department (about $\frac{2}{5}$) are not members of the Union. We are also sorry to state that students who leave the college every year after completing their course successfully, do not retain their membership even though they are allowed the same concession rate of subscription of Rs. 2 as for students in residence.

Office Bearers. Consequent on the demise of Mr. K. T. Bhandari, in February 1938, a vacancy arose among the mofussil members of the Council; this was not filled up. The committee take this opportunity to place on record their appreciation of the services of Mr. Bhandari to the Union while serving as its Secretary as well as in other capacities.

Mr. C. Jagannatha Rao who was a member of the Managing Committee resigned his membership with effect from 1st July 1938 consequent on his transfer to Nandyal. That place also was not filled up in view of the short period of the vacancy before the Annual General Body Meeting.

Meeting of the Council. A meeting of the Council was convened on 18-10-37., with Mr. R. C. Broadfoot, the President, in the chair to consider a communication from the Director of Agriculture, Madras, regarding the organisation of propaganda by means of songs and dramas and awards of prizes for the same. Five members of the Council besides the President, were present. The views of the mofussil members were also obtained by post. The Council felt that the Union could not undertake to finance this activity except by giving publicity to the same by printing such dramas and songs in the Journal or staging them during the College Day.

Meeting of the Managing Committee:— Seven meetings of the Committee were held during the year.

Journal:— The Committee wish to record that a fairly good number of articles on various subjects were received for publication. It is noteworthy that members of other institutions and departments outside the Presidency sought its agency for publishing their papers. We take this opportunity to record our thanks to the various authors of the articles who have contributed to the success of the Journal. But we wish to mention with regret that contributions of general agricultural interest from officers working in the districts were comparatively few. We appeal to these officers to evince more interest in the Journal and thus help the public through it.

We have great pleasure in recording our thanks to the Editor and the other members of the Editorial Board for the efficient conduct of the Journal. We have also to record our appreciation of the promptness and regularity of our printers, The Scholar Press, Palghat, where the Journal continued to be printed during the year.

Subscribers:— The number of subscribers (non-members) to the journal during the year was 180 (as against 200 last year); 30 journals, Indian and foreign, were on the exchange list. We wish to invite the attention of the mofussil members that they would be rendering a great service to the Union if they would help in enlisting more subscribers.

Finance. The auditors' report and the financial statements are before you. Our finances have maintained the progress mentioned last year. A sum of Rs. 200 was added to the Fixed Deposit and Rs. 265 out of Rs. 300 sanctioned, has been spent for renovating stage fittings.

Employment of Agricultural graduates. The three resolutions passed at the last Annual General Body Meeting were forwarded to the Director of Agriculture, and a separate note on the qualifications, status and prospects of agricultural graduates, kindly prepared at our request by Rao Sahib V. Muthuswami Ayyar, was also forwarded. The first two resolutions were kindly forwarded by the Director of Agriculture to the Government for their consideration and we are informed that no orders have yet been received from the Government. As regards the resolution on colonisation of lands, we are informed that this subject was discussed by the sub-committee of the Provincial Economic Council, prior to its dissolution, and that the subject is now under the consideration of the Director of Agriculture.

Ramasastrulu-Munagala Endowment. We have again to record with regret that the response for the Ramasastrulu-Munagala prize was meagre this year also. Only one essay was contributed. We are glad to report that the committee of judges who, at our request, scrutinized this essay recommended the award of the prize to the contributor of this essay, Mr. K. S. Sankaram Pillai. We take this opportunity to congratulate Mr. Pillai and to record our grateful thanks to the judges.

Acknowledgements. Now it is our pleasant duty to convey our thanks to the various members of the Union who have helped it in different ways during the period under review. We have pleasure in recording our grateful thanks to the convenors and members of the various committees who whole-heartedly helped us in celebrating the College Day last year, we are specially grateful to Mr. and Mrs. K. M. Thomas, and Mr. and Mrs. C. Vijayaraghavan who arranged the tea to the visitors on the sports day and to Mr. H. Shiva Rao who conducted the sports. Our thanks are also due to Mr. Longrigg, Principal of the Forest college, for loaning us tents and chairs. We are specially indebted to Mr. R. C. Broadfoot, Principal and President of the Union, who has always been kind and sympathetic towards the affairs of the Union.

College Day Sports.

The athletic sports in connection with the 27th College Day were held under the auspices of the Madras Agricultural Students' Union on Saturday, the 23rd July 1938. The college maidan was as usual decked with flags and buntings. The weather was fine throughout.

The sports commenced punctually at 3 p. m. and all the items on the programme were completed by 6 p. m. There was as usual keen competition. A new record was created this year in Javelin throw by R. Veeraraghavan.

M. Ramiah of the second year class became the champion of this year by scoring 45 points.

After the events were over, Mr. R. C. Broadfoot, Principal and President of the Union, requested Mrs. P. H. Rama Reddy to distribute the Prizes. After the prize distribution, Mr. C. Ramaswami, the President of the sports Sub-committee proposed a hearty vote of thanks to Mrs. P. H. Rama Reddy for so graciously accepting the invitation to give away the prizes.

The Union was 'At Home' to the Ladies and Gentlemen who responded to our invitation to witness the sports. Our thanks are due to Mr. & Mrs. Cherian Jacob for their help in arranging and receiving the guests for the 'At Home'

The Union takes their early opportunity to record their sincere thanks to Mr. C. Ramaswami and the other members of the sports sub-committee and all those who gave of their best to make the function a complete success.

List of Prize Winners.

Cross Country Race (5 miles) (The Norris Cup) (1) M. Zainulabdeen, (2) M. Ramiah, (3) K. Narayana Rao.

Hundred Yards Dash (The Saidapet Old Boys' Cup) (1) K. K. R. Menon, (2) N. V. Srinivasan, (3) Md. K. Adeni.

Long Jump (1) M. Ramiah, (2) C. M. George, (3) M. R. M. Punja.

220 Yds. Dash. (1) K. K. R. Menon, (2) M. Ramiah, (3) Md. K. Adeni.

Shot Put. (1) K. M. Somanna, (2) M. R. M. Punja, (3) K. S. Ramaswami.

High Jump (Rao Bahadur C. Tadulingam Cup) (1) M. R. M. Punja, (2) M. Ramiah, (3) R. Veeraraghavan.

Quarter Mile Race. (The Prince of Wales Cup). (1) K. K. R. Menon, (2) M. Ramiah, (3) M. R. M. Punja.

Cricket Ball Throw. (1) H. T. M. Hegde, (2) R. Veeraraghavan, (3) Mahabala Shetty.

Half Mile Race. (1) N. Sreshta, (2) M. Ramiah, (3) D. Narasimhamurthy.

Javelin Throw. (1) R. Veeraraghavan, (2) K. K. R. Menon, (3) K. M. Somanna.

Half Mile Invitation Race. (1) Government College High School, (2) Municipal High School, (3) Stanes High School.

120 Yds. Hurdles. (The Ramaswami Sivan Cup) (1) M. Ramiah, (2) K. K. R. Menon, (3) C. M. George.

One Mile Race. (1) Sundararaj, (2) Narayana Rao, (3) Md. Zainulabdeen.

Inter-Tutorial Relay Race. Winners. Mr. C. Narasimha Ayyangar's wards.

Obstacle Race. (1) M. D. Azariah, (2) M. R. M. Punja, (3) S. Ibrahim.

Inter-Tutorial Tug of War. (Ramnad Shield) Winners. Mr. C. Narasimha Ayyangar's wards.

College News and Notes.

Students' Corner--Students' Club. At the first General Body Meeting of the Students' Club held on 27-6-38, with Mr. H. Shiva Rao, the Vice-President in the chair, the following gentlemen were elected as office-bearers of the Students' Club for the year 1938-'39.

K. Mahabala Shetty	—	Club Secretary.
K. Kunhiraman Menon	—	Games „
M. R. Nagaraja Rao	—	Cricket Captain.
D. Narayana Rao	—	Tennis „
Md. Zainulabdeen	--	Foot-ball „
A. G. Kesava Reddy	—	Hockey „
H. Narasimhamoorthy	—	Class III Representative.
Chayanalu Upadyayalu	—	Class II „
Koulatlayya	—	Class I „

Welcome to Freshers. On the 14th instant, the students of the second and the third year classes welcomed the students of the first year B. Sc. class and the Short Course. The function began with tea, which was followed by amateur music. After music, the Principal made a speech welcoming the new students. This was followed by other speeches in which the lecturers, tutors and coaches took part. The representatives of Class II and III then extended their cordial welcome to the freshers to which the class I representative made a suitable reply.

Inaugural Address. The inaugural address of the Students' Club was delivered on the 15th July 1938 by Mr. T. S. Avanasilingam Chettiar, M. L. A., (Central)

with Mr V. C. Vellingiri Gounder, President of the Coimbatore District Board, in the chair. The learned lecturer spoke on the necessity of the students taking an intelligent part in politics without sacrificing their studies. He appealed to the students to cultivate the habit of selfhelp and self confidence. The President thanked the lecturer for his interesting address.

Addresses. Sri. N. S. Varadachariar, Parliamentary Secretary to the Hon'ble Minister for Agriculture and Rural Development, delivered an address on 22-7-38 under the auspices of the above club with Mr. G. N. Rangaswami Ayyangar in the chair. He advised the students to live in the villages and improve the lot of the agriculturists, as was done by a band of 4 enthusiastic young men in a village in the Ceded Districts. Rural Reconstruction should engage, he said, their serious attention. The president wound up the proceedings by thanking Sri. Varadachariar for his eloquent address.

The Hon'ble Minister for Courts and Prisons, Sri. K. Raman Menon, addressed the students of the college on the 25th instant. He also emphasised the necessity for the students working for the uplift of the agriculturists. Mr. R. C. Broadfoot, the Principal who presided, said that the agricultural graduates are well equipped for working among the ryots.

Officers' Club. Mr. C. Ramaswami has been elected as the President of the Officers' Club in the vacancy caused by the transfer of Mr. M. U. Vellodi to Tellicherry.

The Officers' Club is shortly to be equipped with a radio set for the entertainment of its members. This is bound to help in attracting more visitors and incidentally more members to the club.

Visitors. Dr. B. P. Pal, M. Sc., Ph. D. (Cantab.), F. L. S., Imperial Economic Botanist, arrived here on the 1st July and left this on the 3rd instant.

Dr. G. W. Padwick, M. Sc., Ph. D. D I. C., the Imperial Mycologist, was a visitor to the Institute during the month.

Rao Bahadur B. Viswanath Garu, Director, Imperial Agricultural Research Institute, is here on a visit to the Imperial Sugarcane Station. He arrived here on the 26th morning and left on the 1st inst.

The Director of Agriculture, Madras, was camping here from the 20th to the 28th in connection with the College Day and other Conferences.

Corrigendum. We regret that by an oversight we mentioned in the previous number of the Journal, on page 228, that Dr. Coleman, Retired Director of Agriculture, Mysore, as having visited the Institute last month. It was Dr. Coleman of the United Lutheran Church Mission who paid the visit.

Personal. We are glad to note that the Ph. D. has been conferred on Mr. N. Krishnaswami by the Kiel University and on Mr. N. Parthasarathy by the London University. The Madras University has conferred the M. Sc. Degree on Mr. P. Uthaman for his thesis on the root parasite--Striga. We offer the recipients our congratulations.

We understand that Dr. S. Ramanujam, M.A., Ph. D., Assistant to Paddy Specialist, has been offered and has accepted the post of Second Economic Botanist at the Imperial Agricultural Research Institute, New Delhi. We offer him our hearty congratulations.

The readers of the *Madras Agricultural Journal* will be interested to know from a letter sent by him to the Union, that Mr. R. C. Wood has booked his passage to England from Trinidad prior to retirement. It may be that he would

have reached England by now. We offer him our best wishes for a happy retired life.

Unemployed Graduates. The attention of our readers, especially the unemployed graduates, is invited to an advertisement published in this issue calling forth applications from Agricultural graduates. Graduates are in this connection reminded of an offer, published in the July number of 1937, from a Mirasdar in Srirangam, to employ an Agricultural Graduate to help him in the management of his lands.

The Association of the Upper Subordinate Officers. At the Annual General Body Meeting of the above Association held on 24th July 1938, the following Office bearers were elected after the reading and adoption of Annual Report of the previous year. *President* :-- Mr. S. N. Chandrasekhara Ayyar; *Secretary* :-- Mr. P. K. Natesa Ayyar; *Committee Members* :-- Messrs. D. Marudarajan, S. M. Kalanaraman and C. Rajasekhara Mudaliar.

Agricultural College and Research Institute. *Amalgamation and Decentralization.* At long last, orders regarding amalgamation of Teaching with Research and decentralization of offices in the Research Institute have been received. It has resulted in the retrenchment of a few gazetted and non-gazetted posts; the axe has fallen heavily on the present incumbents.

RETIREMENT.

Mr. K. Krishnamurthi Rao, who recently retired as Assistant Sugarcane Expert, was one of the later products of the Old Saidapet College. By his retirement yet another link is vanishing between the old Saidapet and the present Coimbatore College. In his retirement Agricultural Science has certainly lost a sincere and earnest worker.

Mr. Rao was a self-made man. With his youthful enthusiasm and unbounded energy, he worked himself up slowly but surely into the high rungs of the official ladder. His devotion to duty and sense of responsibility have stood him in good stead at all times. Systematic and regular in habits, he was always an object of admiration to his younger colleagues. His social habits and extremely pleasing manners endeared him to one and all. In his home he was an ideal husband and loving father.

He was born on 30th June 1883. His early life was beset with troubles and difficulties. Coming from an orthodox community in the Ceded Districts, the father did not like the idea of the son getting out of the beaten track, but the latter's spirit of adventure and enterprise could not be easily subdued.

Master Rao had his early education in his own village. Much against the wishes of his father, the adventurous youth 'fled' to Madanapalle with a few rupees in his pocket and started his High School career which was anything but happy. Passing out of this school, he joined the Revenue Department and, as in the case of some of his predecessors, was deputed by Government to take a course in the Agricultural College, Saidapet, in 1904. A stipendiary student, he passed out in 1906 with first class in six out of eight subjects. Mr. Rao was a good sportsman and has won several prizes in the College. Tennis was his favourite game and still continues to be.



Mr. K. Krishnamurthi Rao.

Mr. Rao was considered in those days very fortunate in getting started as Assistant Farm Manager in the Central Farm on 20th April 1907. In January 1909, on the recommendation of Mr. Shepperson, the then Principal, he was taken as an Assistant in the Chemistry section under Dr. Harrison. In October 1912, Dr. Barber selected him as an Assistant in the Sugarcane Section from among several other applicants, as he had already had to his credit some very interesting investigations in the chemistry of the sugarcane. From that time till his retirement he worked in the Imperial Sugarcane Section at Coimbatore. He was promoted to the gazetted rank on 10th June 1921. The best part of his official life has been spent in research on the sugarcane crop. Several interesting scientific papers have been published in the *Madras Agricultural Journal* and other magazines, as a result of the investigations.

He was one of the founders of the Officers' Club and its first Secretary. He was also its President for more than one term. He continues to be a Life Member of the Club.

Mr. Krishnamurthi Rao was connected with the M. A. S. Union from its inception and acted as Secretary in 1913. He was always solicitous of the welfare of the Union. His personal interest in the Union remains as keen as ever.

Mr. Rao is still of a very active disposition and we trust that his knowledge and experience will still be available to the country in spite of his retirement.

We wish him a very long and happy retired life.

Weather Review—JUNE 1938.

RAINFALL DATA

Division	Station	Actual for month	Departure from normal	Total since January 1st	Division	Station	Actual for month	Departure from normal	Total since January 1st	
Circars	Gopalpore	5.4	-0.4	13.3	South	Negapatam	2.2	+0.9	16.7	
	Calingapatam	6.2	+1.5	12.5		Aduthurai *	2.8	+1.4	9.2	
	Vizagapatam	8.0	+3.1	11.3		Madura	0.3	-1.1	8.8	
	Anakapalli *	8.4	+3.9	12.4		Pamban	0.0	-0.1	11.1	
	Samalkota *	0.0	0.0	0.0		Koilpatti *	1.3	+0.8	15.2	
	Maruteru *	7.1	+3.8	10.1		Palamkottah	0.0	-0.6	13.4	
	Cocanada	6.1	+1.6	8.9		West Coast	Trivandrum	7.5	-5.9	24.6
	Masulipatam	7.2	+2.7	11.3			Cochin	26.3	-2.2	38.2
Guntur *	5.6	+2.2	7.4	Calicut	38.3		+4.2	56.5		
Ceded Dists.	Kurnool	4.4	+1.5	6.5	Pattambi *		25.4	+1.60	41.0	
	Nandyal *	4.1	-1.0	4.6	Taliparamba *		45.8	+8.8	61.0	
	Hagari *	0.6	-1.2	4.5	Kasargode *		40.3	-3.7	56.7	
	Siruguppa *	3.3	+2.2	7.3	Nileshwar *		49.4	+8.3	69.6	
	Bellary	0.9	-1.0	2.9	Mangalore		44.2	+7.4	64.1	
	Anantapur	0.6	-1.4	2.8	Mysore and Coorg		Chitaldrug	1.3	-1.6	4.5
	Rentachintala	3.6	0.0	6.0			Bangalore	2.6	-0.3	5.9
	Cuddapah	6.8	+3.9	7.7			Mysore	1.5	-1.5	4.2
Anantharajupet *	1.9	-0.6	2.9	Mercara			36.1	+13.8	44.4	
Carnatic	Nellore	2.5	+1.2	3.4	Hills		Kodaikanal	2.7	-1.4	15.3
	Madras	1.9	0.0	4.0			Coonoor	0.0
	Palur *	6.6	+4.7	14.0		Ootacamund *	3.9	+1.7	13.3	
	Tindivanam *	5.3	+3.3	10.5		Nanjanad *	3.5	-4.3	10.2	
Central	Cuddalore	1.7	+0.2	8.1						
	Vellore	7.4	+5.0	9.8						
	Salem	2.0	-1.0	6.2						
	Coimbatore	0.5	-1.2	3.3						
	Coimbatore									
	A. C. & R. I. *	0.5	-0.7	2.9						
	Trichinopoly	1.5	+0.1	5.9						

* Meteorological Stations of the Madras Agricultural Department.

⊙ From average rainfall for the month calculated upto 1935 published in the Fort St. George Gazette.

Weather Review for the month of June 1938.

Three depressions were formed during the month, one off the Kathiawar Konkan coast, the second off Circars—Orissa coast and the third in the North Bay of Bengal. The depression off the Kathiawar Konkan coast which appeared on 3rd developed into a deep depression near lat. $19\frac{1}{2}$ N and $67\frac{1}{2}$ E and later moved westwards. The second depression which formed off the Circars-Orissa coast on 6th, became more marked and persisted till 8th and later moved inland having its course along the Central Provinces and Rajaputana. The third one which appeared in the North Bay of Bengal on 17th lay a low pressure over the Central Province on 19th and later got filled up.

Throughout the month the monsoon was active and strong over the west coast, Deccan, and the Central parts of the country. Rainfall was general in parts of Konkan, Hyderabad, Mysore, Malabar, South East Madras, North East Madras

and Madras Deccan. Rainfall was in large excess in Circars, Carnatic and parts of west coast, and defective elsewhere in the presidency.

Chief falls of rain :—

Vizag.	3'3"	
Vellore.	3'7"	3rd.
Calicut.	3'4"	11th.
Mangalore.	6'5"	20th.
Nileshwar.	3'9"	
Taliparamba.	4'6"	
Kasargode	3'9"	

Rainfall report for the Research Institute A. C. R. I.

Report No. 6/38.

Absolute maximum.	92.2° F.
Absolute minimum.	68.0° F.
Mean maximum.	88.0° F.
Departure from normal.	-0.6° F.
Mean minimum.	72.9° F.
Departure from normal	-0.3° F.
Total rainfall.	0.48"
Departure from normal	-0.70"
Heaviest fall in 24 hours.	0.12"
Total No of rainy days.	4 days.
Mean daily wind velocity.	6.2 M. P. H.
Mean humidity at 8 hours.	68.5%
Departure from normal.	+0.5%

Summary. The monsoon was active and caused slight drizzle and light rain except for the last week. Rainfall totalled 0.48" and was defective by 0.70". There was marked fall in day temperatures during the second and third week owing to the advent of the monsoon. The skies were heavily clouded and the south-westerly wind characteristic of the south west monsoon was blowing almost throughout the month.

P. V. R. & P. G.

Departmental Notifications.

Posting

Mr. P. M. Sayeed, B. Sc. Ag. is appointed as Upper Subordinate, Agricultural section, IIIrd grade on Rs. 75/- with effect from 29th June 1938, and posted to II circle, St. Thomas Mount Division.

Transfers.

Name of officer	From	To
Mr. M. Kandaswami	F. M. A. R. S. Nanjanad	A. D. Tinnevely.
.. J. Suryanarayana	A. D. on leave	A. D. Gurzala.
.. T. Seshachalam	A. D. on leave	A. D. Kaikalur.
.. G. Satyanarayan	A. D. Ellore	A. D. Samalkota.
.. V. G Venkataramana Rao	A. D. Ongole	A. D. Kandakur.
.. A. Venkatarangam	F. M. A. R. S. Guntur	A. D. Nellore.
.. D. C. Hanumantha Rao	A. D. on leave	A. D. Nellore.
.. P. Kannan Nambiar	A. D. Perintalmanna	A. D. Calicut.
.. K. Sivasankara Menon	A. D. on leave	A. D. Tellicherry.
.. C. S. Namasivayam Pillai	A. D. on leave	A. D. Nanguneri.
.. G. Venkatakrishna Ayyar	A. D. Nilacottai	F. R. S. Kodur.
.. K. Govinda Kurup	Asst. in Paddy Section, Coimbatore	III circle.

Leave.

Name of officer	Period of leave.
Mr. M. Gopala Chetty, A. D. Chidambaram	L. a. p. on m. c. for 1 month from 23-6-38.
„ S. Venkatarama Ayyar, A. D. Conjeevaram	L. a. p. for 2 months from 3-6-38.
„ R. Govindavelu Naicker, A. D. Peravurni	L. a. p. for 3 weeks from 27-6-38.
„ V. Ramunni Kidavu, Farm Manager, Taliparamba	L. a. p. for 1 month from the date of relief.
„ K. C. Thomas, Farm Manager, Central Farm.	L. a. p. for 45 days from 20-6-38.
„ L. Neelakantan, Cotton Asst. A. R. S., Nandyal.	L. a. p. for 1 month from 17-6-38.
„ S. Viravaradaraju, A. D. Chittor.	L. a. p. for 1 month from 4-7-38.
„ P. V. Hariharan, Millets Asst. A. R. S., Palur.	L. a. p. for 1 month from 9-7-38.
„ G. Konda Reddy, F. M. A. R. S., Nandyal.	Extension of L. a. p. for 1 month
„ J. S. C. Antoney, A. D. (on leave)	Extension of L. a. p. for 4 months from 21-6-38.