Madras Agricultural Journal

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CONTENTS

Editorial.

The Twenty-fourth College Day and Conference. Under the distinguished Presidentship of the Hon'ble Mr. C. A. Souter, Revenue Member to the Government of Madras, the College Day and Conference were held this year on the 2nd and 3rd August. The inspiring address of the President and a general account of the Conference are to be found elsewhere in this issue. The papers contributed to the Conference dealt with a variety of subjects. Several of the important crops of the province like cotton, rice, groundnut, sorghum etc. were dealt with by the respective specialists drawing attention to some of the salient features of improvement work on them. Two of the general papers "Agricultural indebtedness" and "Agriculture as a profession" evoked a keen discussion in which a number of people present, including the President and the Director of Agriculture took part.

We are glad to note in this connection, that the local Legislative Council have recently given assent to a measure intended to relieve indebtedness of agriculturists. While it may be considered that the amount–about 14 lakhs of rupees–set apart towards relieving indebtedness is rather small, we are sure that the Government having recognised the need for the act, ways and means would be found in years to come to provide funds towards this in a much larger measure.

In the discussion following the paper on Agricultural Indebtedness the President rightly remarked that attempts should first be made to relieve distress among smaller landholders who formed the bulk of the indebted people and that extending the provision to the bigger landlords who are equally in difficulties would depend upon the financial resources available.

The paper on "Agriculture as a profession" naturally led to an exhaustive discussion on the question of Agricultural Graduates settling on lands and carrying on farming as a business. Though several of the members present did not share with the author of the paper his optimism, about the practicability of the idea, under the present trying conditions that agriculture is passing through, there is no doubt that the subject is of great importance and worth investigating into.

The paper on the use of the "Radio in Agricultural Propaganda" broke new ground and though we might just be thinking of it in Madras, other countries in the West have advanced far in that direction. Even in India, some of the provinces like Bengal and the Punjab have already formulated proposals to utilise a portion of the grant made by the Government of India towards rural development, on the installation of radio sets in a number of villages.

We are happy to note the President in his address pointed out, that in the future reformed Government, the Agricultural Department was bound to expand and should have a large say in the prosperity of the province. We are sure that in any rural development work, the agricultural graduate will have an ever increasingly important part to play. It has been realised that any improvements in the rural problems can be brought about only by a co-ordinated action of a number of Government Departments like Agriculture, Veterinary, Co-operation, Public Health, Education, Industry, Revenue etc. Every local Government is now fully alive to this question and the recent decision to form an Economic Council in Madras is a happy augury. We only hope that the agricultural graduates who by the very nature of their training are the best fitted persons to tackle problems of rural development, will get their opportunities.

The creation of an Economic Council in our province leads us to examine how the different provinces are proposing to utilise the grant made by Central Government towards rural reconstruction. Each province is formulating its own schemes for utilising the amount. While a good portion of the grant is to be spent in every province towards improvement of rural sanitation, rural water supply, provision of rural dispensaries etc., some of the provinces like the Punjab, Bengal and Bombay are proposing to earmark portions of the grant, towards certain definite items of actual agricultural improvement. In the Punjab, for instance, schemes like fruit farming, sheep breeding

and improvement of the wool are to be financed from out of this grant. In Bombay, there is a proposal to specially employ agricultural graduates towards improving the strain of milch buffaloes and poultry in certain selected parts. In Bengal, the proposals include the establishment of seed and crop demonstration centres and the introduction of agricultural training in selected secondary schools. In Madras, on the other hand, we do not find a single item of *direct* agricultural work among the proposals under consideration. We are sure it is not due to any dearth of suitable schemes and we do hope that this omission will receive the attention of the Madras Economic Council and be rectified by them. Madras proposes to spend nearly 5 lakhs of rupees out of the grant, towards improving village communications. While we do realise the great importance of good communications in rural parts, we have to point out that roads once laid have to be maintained with recurring expenditure and we hope that this will be borne in mind in launching big schemes of road-laying.

In every province, provision has been made to place at the disposal of every Collector or Deputy Commissioner of the District, a lump sum to be spent on rural amenities in the district. We are sure that in the expenditure of the discretionary grants, members of the several Government Departments in each district will come in contact with the head of the district administration and this should form one of the means of his remaining in touch with the activities of the various departments, the necessity for which was emphasised by Mr. Souter in his Presidential address.

The Next Viceroy of India. As we go to Press we learn of the appointment of Lord Linlithgow as the next Viceroy of India. The appointment should bring great satisfaction to all the people in India and particularly to the agriculturists. As Chairman of the Royal Commission on Indian Agriculture during 1926–28, he has acquired an intimate knowledge of India and the needs of its rural life. His chief interest has been in Agriculture and he was the Chairman of the Departmental Committee on the Distribution and Prices of Agricultural Produce in England in 1913. His abiding interest in agriculture is also revealed by the Directorship he holds in the Scottish Agricultural Industries Limited, by his being President of the Edinburgh and East of Scotland College of Agriculture and by his appointment as Chairman of the Market Supply Committee in 1933, an appointment which he still holds. While Indian agriculture has made rapid strides within the last few years due to the keen interest evinced by our present Viceroy, we may be sure of a greater impetus to this prime industry of the country, in days to come with Lord Linlithgow as the Head of the Government. The members of the Madras Agricultural Students' Union wish to take this opportunity of recording their extreme satisfaction in the appointment.

The Diamond Jubilee of Agricultural Education in South India. By 1936 we will be completing 60 years, since Agricultural Education was initiated in South India and it is proposed to celebrate the same in a fitting manner at Coimbatore, next July. This happens to synchronise with the Silver Jubilee year of the Madras Agricultural Students' Union and the General Body of the Union considered the other day, various proposals regarding the joint celebrations. Two of the items in the celebrations will be the holding of a comprehensive Agricultural Exhibition and the publishing of a Commemoration Volume. These should involve considerable expenditure and it is proposed to approach Government and the various landed gentry of the province for donations towards the same. The Managing Committee of the Union proposes to take an early move in the matter and suggestions of ideas and help are quite welcome from all readers.

Symposium on Disease Resistance in Plants. We are glad to learn that under the joint auspices of the Indian Academy of Sciences, the Association of Economic Biologists, Coimbatore, and the Society of Biological Chemists (India), a symposium on Disease Resistance in Plants is to be held in Coimbatore on 5th and 6th October 1935. Invitations have been issued to all Scientists working on pathological problems in various parts of India and we understand that Dr. K. C. Mehta of Agra will preside over the meetings. It is proposed to publish all the papers read before the symposium in the form of an illustrated monograph. We welcome the proposal as we are sure the symposium will serve the purpose of bringing together all the research workers in the line and taking stock of what has been done in India in this investigation.

The subject of plant diseases in India is still in its infancy, the work with a few exceptions being confined to the Imperial and Provincial Agricultural Research Institutes. There are several diseases which take a heavy toll on the different agricultural crops of India about which our knowledge is still obscure. The Imperial Council of Agricultural Research is financing a number of research schemes on plant diseases but there are several aspects of work still remaining untouched. Great advances have been made in the countries of the west in the identification and the tackling of the group of diseases known as "virus diseases" and under this head some work has already been done in India on the Spike Disease of Sandal and the Mosaic of Sugarcane. Breeding for disease resistance has always formed a fruitful line of work followed by the crop breeders. Mention may be made in this connection of the work on wheat and *arhar CAJANUS INDICUS* at Pusa and on rice at Coimbatore.

We congratulate the organisers of the symposium and we are looking forward to see the promised monograph in due course.

THE TWENTY-FOURTH AGRICULTURAL COLLEGE DAY AND CONFERENCE.

With hardly an interval of six months since the last College Day in December 1934, there was just a fear whether the Twenty-fourth College Day and Conference proposed to be held in August, would pass off as usual, satisfactorily and well. The success of the function however, far exceeded our anticipations, and, in a large measure it was due to the Honourable Mr. C. A. Souter, I. C. S., C. I. E. whom it was our extreme good fortune, to secure as President. With his genial personality, his informal manners, his sympathetic outlook, his all-round equipment, and his wide experience of men and things, he lent to the Conference, a dignity and an authority, and contributed to the successful march past, of an important milestone in the route of what has now come to be recognised on all hands as, Provincial Conferences on Agriculture.

Yet another feature of this year's celebration was the presence of Mr. B. G. Holdsworth I. C. S., the Collector of Coimbatore in our midst, during the morning sessions and his occupying the chair during the afternoon when the Honourable Mr. Souter had to be unavoidably absent. It was in the fitness of things, that following close on the advice of the President in his address, about the coordination of various departments, two important officials of the Revenue Department should have taken an active part in our Conference, and it augurs well for the future, since following this excellent example, co-operation between different departments might well become the rule of the day.

The Conference. Punctually at 9 A. M. on Friday the 2nd August 1935, the Honourable Mr. Souter declared the Conference open, after which Mr. R. C Broadfoot, the Principal of the College and President of the Union, gave his welcome speech*. Messages wishing the Conference success were then read by the Secretary and these were from the following well wishers of the Union:—Mr. P. H. Rama Reddy, Rao Bahadur B. Viswanath, Sir Frederick Nicholson, Rao Sahib Y. Ramachandra Rao, Mr. G. R. Hilson, Sir T. Vijayaraghavachariar, Mr. C. V. Venkatramana Iyangar, Mr. Allen Carruth, Rao Bahadur M. R. Ramaswami Sivan, The Hon. Mr. P. T. Rajan and the Raja of Dharakota. The Secretary then presented the Annual Report * of the Committee, for the past six months of their tenure of office, which report showed the steady all round progress which the Union and the journal had been maintaining during this period; the report also emphasised, among other things, the desirability of utilising unemployed agricultural graduates in the Rural Reconstruction schemes, recently inaugurated by the Government of India.

* Published elsewhere in this issue.

The President then gave away the following prizes and medals to the various prize winners amongst the students of the College.

The Robertson medal.	C. P. Kesavan.
The Clougstone medal.	V. Sadasiva Iyer.
The Kees medal.	K. Sriramulu.
The Sampson Prize.	M. M. Krishna Marar.
The Dewan Bahadur Raghunatha Rao Prize.	V. Sadasiva Iyer.
The D'silva Prize.	R. Githachari.
The Goshen Prize.	R. Githachari.
The Anstead Prize.	P. Kannian.
The Rao Bahadur K. S. Venkatramier Prize.	H. Krishna Kumar.
The Certificate course cup.	T. Arunachalam.
The Ceded districts Old Agricultural Association Prize	C. Bhujanga Rao iii year. Ali Hyder ii ,, Kadir Razack i ,,
The Dewan Bahadur Sir T. Vijayaraghavachariar medal	K. Jayaraman.

After the presentation was over, the President delivered his address * an extempore informal talk, full of ripe wisdom and practical advice to the students of the College and the officers of the Department.

The following papers were then presented before the Conference, in order

1.	Agricultural indebtedness.	By M. R. Ry. Rao Bahadur K. S Venkatramier.
2.	Agriculture as a practical Proposition.	M. R. Ry. C. S. Namasivayam Pillai.
3.	† The drift of economic equilibrium of class interests.	M. R. Ry. M. Satyanarayana.
4.	Radio and Agricultural Propaganda.	M. R. Ry. T. V. Rangaswami.
5.	Agricultural Meteorology in relation to insects.	M. R. Ry Rao Sahib Dr. T. V. Ramakrishna Iyer & Mr. K. P. Ananthanarayanan.

The papers were followed by discussions * from the members of the audience, the president himself contributing to several of them, with valuable remarks and the morning sessions terminated with a vote of thanks * by the Director of Agriculture to the President, who had to absent himself for the evening sessions for unavoidable reasons.

The afternoon sessions opened under the Presidentship of Mr. B. G. Holdsworth, I. C. S., Collector of Coimbatore and the following further papers were presented, followed by discussions as in the morning.

6.	Physico-Chemical studies in Jaggery.	By M. R. Ry. T. Varahalu.
7.	Juiciness and sweetness in Sorghum stalks.	By M. R. Ry. Rao Bahadur G. N. Rangaswami Iyangar.

* Published elsewhere in this issue.

† Taken as read.

8.	Deterioration in the quality of Cambodia Cotton.	By M. R. Ry. V. Ramanatha Iyer.
9.	Increasing the yields of Groundnut.	Dr. J. S. Patel.
10.	Production and Marketing of Groundnuts in Madras.	M. R. Ry. K. Raghavachari.
11.	Results of some recent manurial experiments with Rice.	M. R. Ry. K. Ramiah.
12.	The leafcurl disease of Chillies caused by thrips in the Guntur and Madras tracts.	Rao Sahib Dr. T. V. Ramakrishna Iyer, M. S. Subbiah and P. S. Krishnamurthi.

On account of a prior engagement, Mr. B. G. Holdsworth himself had to leave the Conference before the last paper, and his place was taken up by M. R Ry. Rao Bahadur D. Ananda Rao, the Director of Agriculture. Before he left, Mr. B. G. Holdsworth thanked the Director of Agriculture and the Principal for the opportunity given to him to deputise for the distinguished President of the Conference, and added that he had listened to the proceedings with considerable interest and benefit, and felt that he knew a lot more about jaggery, sorghum, groundnut and cotton, than before he attended the Conference. The Director of Agriculture thanked Mr. B. G Holdsworth for so readily filling the breach and observed that now that he had been initiated into the science of Agriculture and had had his appetite whetted, Mr. B. G. Holdsworth would do them the honour to visit the Institute as often as he could on spare afternoons and acquaint himself with the work done by the officers, on behalf of whom he could always assure a very hearty welcome to Mr. B. G. Holdsworth.

The Conference terminated with a vote of thanks by the Principal to the Director of Agriculture.

Entertainment. On Friday night the students gave an entertainment in four languages; English (*Unemployed or Too Late*, a farce by Mr. P. V. Ramiah). Malayalam (*Basana Vijayam*), Telugu (Scenes from *Sakkubai*), and Tamil (*Santha's Suitors*—A social play by Mr. M. R. Balakrishnan). Inspite of the fact that the four entertainments had to be crowded into one night, the pieces selected were all short, and the student actors enacted their parts so well, that the audience were kept in good humour right to the end. Where one and all of the actors rendered their parts very creditably and cooperated wholeheartedly with the correct team spirit for the success of the whole show, it is difficult to make any invidious distinction, but mention must be made of the excellent acting and singing of Lakshminarayana which went far to create a good impression of the Telugu piece.

Exhibition. On the lines arranged last year, an exhibition was arranged this year also in the Biological Hall, Freeman Building. All the heads of sections and the officers from the district and the

Sugarcane Expert cooperated and put up very interesting stalls; in addition, Mr. G. Venkatarathnam, son of Mr. G. R. V. Raju, Assistant Farm Manager, Botanical Gardens exhibited some mechanical devices of his which he had patented, and Mr. G. Mahadevan an 'old boy' put on show, produce from his estate and eucalyptus oil. The Hon. Mr. Souter visited the Exhibition on the afternoon of the 3rd in company with the Principal and the Director and spending a good deal of time at each stall evinced great interest in all that he saw.

How interesting and instructive the whole show was, could be gauged by the fact that while originally it was arranged to run it only for three days (2nd to 4th) it was extended by one day more (on the 5th) at the special request of the public and the headmasters of institutions in Coimbatore.

Sports. In unusually warm and sunny weather for this part of the year, the sports were held on the afternoon of Saturday the 3rd August, on the College *Maidan.* As usual, there was a large gathering of students, officers of the department, – resident and mofussil – ladies, and visitors from Coimbatore Town, and the 'Union' was 'At Home' to the guests. Although no records were broken, the events were very evenly contested, the Championship Cup being annexed by Mukundan of I year, with 38 marks, he being closely followed by Krishnananda Sastri of II year and James Colaco of the III year, who obtained 28 and 26 marks respectively. At the end of the sports Mrs. B. G. Holdsworth, wife of the Collector of Coimbatore, very kindly gave away the prizes to the several winners and the function successfully terminated with Mr. H. Shiva Rao, President of the Sports Committee calling for three cheers to Mrs. B. G. Holdsworth, which were lustily responded to.

Below is the list of prize winners.

I. CROSS COUNTRY RACE : 1. S. Krishnananda Sastri. 2. T. Marthappa Kini. 3. R. H. Krishnan.

II. HUNDRED YARDS DASH : 1. K. Kunhiraman Menon. 2. James Colaco. 3. M. Mukundan.

III. CHILDREN'S RACE (GIRLS OVER 7 YEARS) : 1. O. C. Lakshmikutti 2. Elizabeth.

IV LONG JUMP : 1. M. Mukundan. 2. K. I. Tobias. 3. J. Colaco.

V. 16 Lb. SHOT PUT : 1. M. Mukundan. 2. T. Arunachalam. 3. P. M. Sayeed.

VI. HIGH JUMP : 1. M. S. Kulandaiswami. 2. J. Colaco. 3. K. Ramanarayana Menon.

VII. CHILDREN'S RACE (BOYS OVER 7 YEARS) : First race : 1. Venkateshwaran. Second race : 1 Balagopal.

VIII. QUARTER MILE RACE : 1. J. Colaco. 2. M. Mukundan. 3. S. Krishnananda Sastri.

IX. PEONS' RACE : 1 Marudachalam—Cotton Section. 2. Savari—Paddy Section.

X. CRICKET BALL THROW : 1 M. Mukundan. 2. Moncy Joseph. 3. C. T. Ittyachan.

XI. CHILDREN'S RACE (GIRLS UNDER 7 YEARS) : 1. Marudayammal. 2. Sabiriammal.

XII. HALF MILE RACE : 1. S. Krishnananda Sastri. 2. K. Jayaraman. 3. T. Marthappa Kini.
XIII. JAVELIN THROW : 1. S. Rajaraman. 2. Tobias. 3. Mukundan.
XIV. POLE VAULT : 1. T. Arunachalam 2. M. S. Kulandaiswami. 3. Tobias
XV. HALF MILE RACE (INVITATION) : 1. Municipal High School, Karuppan. 2. Govt. H. E. Training School, Siromani.
XVI. 120 YARDS HURDLES : 1 Tobias. 2. K. Kunhirama Menon. 3. J. Colaco.
XVII. CHILDREN'S RACE (BOYS UNDER 7 YEARS) : 1. A. V. Raghavan. 2. R. Govindan.
XVIII. OLD BOYS' RACE : S. Varadarajan. M. D. Prabhu. (Dead heat).
XIX. ONE MILE RACE : 1. D. V. Rajagopalan. 2. Krishnananda Sastri. 3. Jayaraman.
XX. OBSTACLES RACE : 1. Subramanyam. 2. Mukundan. 3. Jayaraman.
XXI. INTER-TUTORIAL RELAY RACE : Mr. B. M. Lakshmipati's wards.
XXII. INTER-TUTORIAL TUG OF WAR : Mr. B. M. Lakshmipati's wards.

The General Body Meeting of the Union was held on Sunday the 4th August, under the chairmanship of the President of the Union, Mr. R. C. Broadfoot. After the minutes of the last meeting, the annual report, the Auditor's report and the budget for the coming year were all adopted, the following amendments to rules which were renewed by the committee were passed.

1. In rule (2) under A. Membership, add a further clause. "(iv) and officers of other agricultural departments."

2. In rule (2) under B. Subscription, add a further clause "and rupees four for officers of other agricultural departments."

3. In rule 5 C. under election of officers, add after line 8 "seconded by another" the words "with the written consent of the nominee".

The meeting also considered in an informal manner lines on which the Diamond Jubilee of Agricultural Education in South India, and the Silver Jubilee of the Union which come off in 1936 should be celebrated. The office bearers were then elected for the coming year and the following is the full list.

COUNCIL (15)

1. R. C. Broadfoot, President (Ex-Officio).
2. The Resident Vice-President.
3. Mr. K. Gopalakrishna Raju. } Mofussil Vice Presidents.
4. „ K. Unnikrishna Menon. }
5. „ G. Jogiraju. }
6. The Editor.
7. The Secretary.
8. Mr. K. T. Alwa. } Mofussil Members.
9. „ C. V. Sarvayya. }
10. „ C. Ramaswamy. }
11. „ K. S. Ramana Rai. }
12. Rao Sahib Dr. T. V. Ramakrishna Iyer. } Resident Members.
13. „ T. V. Rajagopalachariar. }
14. „ V. Muthuswami Iyer. }
15. Mr. P. M. Sayed — Student Member.

MANAGING COMMITTEE (9)

1. Mr. S. Sundararaman (Resident Vice President.)
2. „ C. S. Krishnaswami (Secretary.)

3. Mr. K. Ramiah (Editor.)
4. ,, M. A. Sankara Iyer (Treasurer)
5. ,, S. M. Kalyanaraman (Manager.)
6. ,, M. U. Vellodi
7. ,, K. Krishnamurti Rao. } Officer Members.
8. ,, S. V. Doraiswami.
9. ,, H. Krishna Kumar—Student Member.

EDITORIAL BOARD (7)

1. The Editor.
2. Mr. M. R. Balakrishnan (Sub-Editor.)
3. The Secretary.
4. The Manager.
5. ,, K. Raghavachari } Officer Members.
6. ,, S. R. Srinivasan
7. ,, J. Raghothama Reddy—Student Member.

The principal took the opportunity to thank Mrs. Cherian, Mrs. Charley, Mrs. Raghavan, the Principal of the Forest College, Mr. Vincent of the Variety Hall, and all others who rendered help in connection with the college day and conference.

The General Body Meeting dissolved after a proposal by Mr. V. Muthuswami Iyer that the thanks of the General Body to the retiring Committee be recorded.

The Principal's Welcome Speech.

This is the fifth occasion on which it has been my privilege as President of the Madras Agricultural Students' Union to extend the Union's welcome to those attending the annual conference. On this occasion I wish to express the hope that your visit will be pleasant and profitable and will provide a memory which will endure long after the Conference is over.

It is a particularly pleasing privilege to introduce the Hon'ble C. A. Souter, Revenue Member of His Excellency the Governor's Council and to express to Mr. Souter the Union's thanks for so kindly accepting the Presidentship of this year's conference. As Revenue Member, Mr. Souter has a deep interest in Agriculture and his presence here to-day is a practical expression of his sympathy in our activities.

We welcome also Rao Bahadur D. Ananda Rao, our Director of Agriculture and express satisfaction at the recent honour conferred on Dr. T. V. Ramakrishna Ayyar who has recently retired from service. Dr. Ramakrishna Ayyar has been one of the stalwarts of our Union and throughout his service has done much to assist in its efficient working.

The Conference Programme has been issued to you all and I would particularly commend your attention to the working Exhibition which has been staged in the Biological Laboratory in the Freeman Building. As the time is limited and the conference programme pretty full it was considered advisible to concentrate as many of our activities, as time and space, would permit, in one centre and I hope that all or at least as many as can do so will visit the Exhibition It will remain open from 8 A. M. to 6 P. M. to-day, to-morrow and on Sunday, when representatives from each section will be pleased to welcome visitors and explain the work of their respective sections. For those who prefer the wide and open spaces and the more practical aspects of Agriculture, I suggest

a visit to the Central Fram where many of the varied activities in mixed farming can be seen. The Farm-yard, Dairy, Veterinary hospital, garden and wet land cultivation and the orchards are sure to provide many items of interest to Agriculturists, both scientific and practical. The Superintendent of the Farm will be pleased to make arrangements for conducting parties on the Farm.

To-morrow afternoon we hold our annual sports when the Union will be at home to all members and friends. We desire a large attendance at this function.

Medals and prizes won during the last session will be presented during this conference and I congratulate the winners on their success. One must however realise that while the prize goes to a particular student the margin of marks is often very close and less fortunate students may derive comfort from this thought. To all students who have left this College I wish the best of luck and fortune and I trust that each will give freely of his knowledge where such will be of help to his fellow men. Rural uplift is a subject receiving increased attention and I know of none who can assist in this work better than a graduate of this College.

Finally a word on your duty towards the Union. It is hoped that wherever you may be you will continue your allegiance towards the Madras Agricultural Students' Union and help to maintain it as an important link between your work and your College days. It is worthy of, and will appreciate, your full support in the years to come.

To the Union's welcome I now add my personal thanks for your presence here and for your assistance in making the Conference a success.

The Hon'ble Mr. C. A. Souter's Presidential Address.

I am afraid that if you are looking forward to any remarks of a scientific nature from me, you will be greatly disappointed. In the first place, I do not feel competent to talk on scientific matters, before a number of experts—perhaps the youngest student among you here, will turn me inside out in five minutes, if I start talking any science. To scientific minds accustomed to precision, my remarks will therefore appear discursive.

I therefore propose to confine myself to a few remarks of a general nature which will be in the form of advice to you, students, Government servants or men who have taken to agriculture. We are on the eve of almost revolutionary changes in the system of Government, and in the next two years the Madras Presidency will have full control of her house. The various departments are all wondering what is going to happen to them, but whatever happens to other departments I feel that the Agricultural Department, is a Department that has to abide, extend and expand, for in the future, the Agricultural Department will have a very large say in the prosperity of the Presidency. And I feel that in that connection, the students of this College will have an important part to play.

I wish at this stage to give a word of advice to students. It has been my unfortunate experience to come across boys who the moment they leave the College, and obtain degrees or diplomas, think they have learnt everything. But when you go out into life, you will find

that the more you come into contact with the actual problems, the more you do not know, because there is nothing like an ending in the science relating to the growth of vegetation. Nature has never revealed, and never will reveal all her secrets. I will therefore advise you. after you leave the College, and either enter public life as Government servants or tillers of your own land, to keep up-to-date. This is essential at least for one reason, if not for many more, and that is, that competition at present rules the market. For example why should Cochin China be able to export her rice here and sell it at a price at which it cannot be produced here? Are their agricultural practices better than yours? Then it is your duty to study them and unless you keep yourselves up-to-date with agricultural science and put on the market your products at competitive prices, other nations will leave you behind.

To keep up-to-date, the man working on the field, with his hands full of his work with the actual ryots, has no time for research or study and it is the duty of the specialists, to give their results in an easy and intelligible form, understandable to the worker who has no leisure for research. True it is that in your agricultural journals are published articles with details of a technical and scientific nature, but it is difficult for the worker who is handicapped for want of time, to grasp the real meaning of these articles. The specialist therefore must give a precis or resume of his work in such a form, that it is easy to carry out the experiments he advocates and with the specialist and the field worker working hand and glove, I am sure that propaganda will be easiest and most effective. I commend this aspect to you.

There is yet another point which I would like to commend to your notice. When I first came to India, the Collector was a very important Government official and was almost a god over the district he was in charge of—all departments came to him for assistance. That system has now disappeared and there is now an unfortunate tendency for each department to work by itself—the Agricultural Department, the Forest, the Revenue and the Irrigation Departments, each not knowing what the others do. If not entirely as before, at least informally, a sort of return to the old system, seems to me to be desirable. I therefore suggest that representatives of the various departments in a district should approach the Collector, with advantage to themselves and certainly with advantage to the Collector. Even specialists, will find it extremely helpful to approach the officers of the Revenue Department and will find they get far more sympathy and help than they imagine.

Annual Report of the Activities of the Union.

(*Read by the Secretary*).

The Managing Committee of the Madras Agricultural Students' Union beg to submit a review of the activities of the Union for a period of seven months from December 1934 to July 1935. The tenure of office of the present Committee

has been the shortest on record owing to the fact that the 23rd College Day and Conference which should have been held in July last had to be unavoidably postponed to December. And in order that the original practice of holding the College Day and Conference, in about July, be resumed, it was necessary either to have it celebrated now, or postpone it till July 1936,—after an interval of one-and-a half years. The Committe after much deliberation chose the former and they are glad that their decision was a wise one, in that they were able to secure as the President of the Conference this year no less a person than the Hon. Mr. C. A. Souter, whose distinguished presence on this occasion, more than compensates for the strain on the resources of the Union caused by the briefness of the interval between two successive College Days.

The Union. Founded in the year 1910 by a small band of devoted enthusiasts, the Madras Agricultural Studeuts' Union has grown from childhood to adolescene, gathering strength as it grew, and is now in its 26th year of its existence, a fully alive, vigorous and useful organisation; amply fulfilling the hopes of its early founders, and carrying out faithfully the objects they had in view, viz., the celebration of the College Day year after year and the publication of the Madras Agricultural Journal. Sustained solely by the enthusiasm of its members, the Union hopes to extend the scope of its usefulness, with the aid of a little financial help from outside, but of that later.

Silver Jubilee. The period under review, though short, has been remarkable in many ways. Many events of great importance have taken place. Foremost among them was the occasion of the Silver Jubilee of His Majesty King George's accession to the throne. The Union rejoiced along with millions of His Majesty's subjects at the happy event, and takes this opportunity to express its deep sense of loyalty towards the King.

His Majesty's reign has been marked with a steady and all round development of the Agricultural Departments in India and it was at His Majesty's command that the Royal Commission on Agriculture visited India in 1926 and did yeomen service to the cause of Indian Agriculture Based on the findings of the Commission, the Agricultural Departments were reorganised, the Imperial Council of Agricultural Research was formed, new schemes of research and propaganda were laid out, and the attention of the Provincial and Imperial Governments drawn to the need of improving the lot of the Indian agriculturist. The Union is deeply grateful to His Majesty for this act of grace.

The Union is glad that among the recipients of Jubilee Medals are a number of members of the Madras Agricultural Students' Union and the Union tenders its congratulation on the honour conferred on them.

Quetta. While the celebration of the Jubilee was one of the happiest occasions in the country the terrible disaster that befell Quetta in June cast a gloom over the entire peninsula and reminded us rudely of the words of the poet that "like flies we are to the wanton gods. They kill us for their sport". The Union records its heartfelt sympathy to the victims of the disaster and appeals to its members to lend a helping hand in relieving the distress in that unfortunate area.

Ceded Districts. Our sympathies also go to the people of the Ceded Districts, who have been in the grip of famine for the last two years. We hope and trust that with the completion of the Tungabadhra Scheme which has been inaugurated recently, the arid tracts of this area will not be dependent on the vagaries of a fickle monsoon.

Needs of the Cultivator and Agricultural Graduates. The passing of the India Bill in Parliament, is another historic event which will have far-reaching consequences on the people of this country, the bulk of whom are agriculturists, in whose interests we hope the coming reforms will be worked. The magnificent

gesture of the Government of India in alloting the sum of one crore of rupees for rural reconstruction and the formation of the Economic Council are signs of the awakening in the country to the needs of the cultivator of the soil, and we hope that this feature is an earnest of what is to come and more and more funds will be devoted in future towards the amelioration of the rural classes than has hitherto been done. In this connection we, the Union would respectfully suggest to Government that the talents and services of the unemployed graduates of this Madras Agricultural College may be utilised in order that the knowledge and experience they have attained at considerable cost may be of use to the State and the people. While the Union fully endorses the view, that the ideal of the Agricultural Graduate should be to till his land, and thus set an example to others, it also realises the patent fact that the present economic depression, and a number of other factors tend to discourage the pioneer and it is of opinion that instead of striving at an ideal at an inopportune moment, it is better to utilise the talents of these young men to the best advantage under the existing circumstances. The education they receive at this Institute teaches them the dignity of labour, the need for attention to details, and above all the grit to rough it in life, and the Union has no doubt whatever that they are the men best fitted to carry out the schemes of rural development contemplated in the Government's programme.

New Schemes. In last year's Conference the subject of Marketing formed an important part of the programme. The period under review saw the formation of the Marketing Boards and the appointment of the Provincial Marketing Officer and his assistants for our Province. The Imperial Council of Agriculture have launched many schemes during the year the following two being the more important ones. 1 Goat breeding 2. Travancore leaf diseases in coconut. Lastly, the Union is immensely proud that one of our enthusiastic members Mr. V. Jogi Raju has at considerable personal sacrifice set apart a sum of Ten thousand Rupees for rural development. It may not be possible for others to emulate this excellent example, but the spirit underlying it should permeate every member of the Union.

The Journal. The Committee is glad to state that the Journal has continued to maintain the high standard set up in previous years and was published with unerring regularity. The Journal has now firmly established itself in the list of agricultural journals of the world, and the innumerable enquiries from far and near, and the request from foreign libraries to include them in our mailing list bear ample testimony to its standing. With the raising of the standard of the Journal, a proportionate increase in the responsibility has also devolved on the Managing Committee of the Union and the Editorial Board. While the Journal, so far as it goes, is self supporting, it has been found impossible to raise the standard of its get-up, with the existing financial resources, and therefore the Union makes bold to renew its appeal to Government, to strengthen its finances by a hand-some subsidy.

The Twenty-third Agricultural College Day and Conference 1934. *Conference.* On Thursday the 13th of December the Conference assembled at 9 A. M. under the distinguished presidentship of M. R. Ry. Dewan Bahadur Mocharla Ramachandra Rao Pantulu Garu, B. A., B. L., President, Land Mortgage Bank, Madras. After the President declared the Conference open, Rao Bahadur D. Ananda Rao, President of the Union welcomed the visitors to the Conference. After this, messages of good wishes were read, prominent among which were those from Mr. Allan Carruth, Rao Bahadur Ramaswami Sivan, Mr. S. Burns and others. [An account of the past College Day and Conference is found in the January issue of the Journal Vol. xxiii, No. 1.]

Retirement. Dr. T. V. Ramakrishna Ayyar retired from service on the 20th July of this year. In his retirement the Department loses the services of one of its ablest officers and a distinguished scientist. Dr. Ramakrishna Ayyar was closely associated with the Union and was sometime its Editor, and Vice-President. Mr. T. R. Venkaswami Rao also retired from service after 30 years of service. He is one of our oldest members, and a sincere lover of the Union. The Union wishes them long life, happiness and prosperity.

M. Sc. Degree and Foreign Studies. We congratulate Messrs. K. M. Thomas and T. Rajagopala Ayyangar on their being awarded the degree of M. Sc., of the Madras University for their thesis on "Foot-rot of paddy" and "The Groundnut root nodule organism" respectively. We are also glad that Messrs. K. M. Thomas, N. Parthasarathi, R. Kochukrishna Pillai and S. Ramanujam will be proceeding to England on leave for further studies. We wish them bon-voyage and sucess in their endeavours.

Titles. Among the persons associated with the Union the following were awarded titles during the year and the Managing Committee congratulate Dewan Bahadur T. A. Ramalingam Chettiar, Rao Sahib Dr. T. V. Ramakrishna Ayyar, Rao Bahadur G. N. Rangaswami Ayyangar, Rao Bahadur M. V. Vellodi, Rao Sahib V. Muthuswami Ayyar and Dewan Bahadur V. N. Viswanatha Rao on the honours conferred on them by Government.

The Union takes this opportunity to congratulate M. R.Ry. Rao Bahadur D. Ananda Rao Garu on his appointment as Director of Agriculture. The Union is proud to claim him as one of its oldest members and sincerest well wishers. With his deep and profound knowledge of the agricultural science his intimate acquaintance with the working of the Department, his ripe experience and transparent sincerity of convictions we have no doubt that the destinies of the Madras Agricultural Department are in safe hands.

Acknowledgements. It is now our pleasant duty to record our grateful thanks to all those who helped the Union during the year. To Principal, R. C. Broadfoot Esqr, who as ex-officio President has been identifying himself with the Union, and guiding us in all our deliberations, our thanks are due. To the President of last year's conference Dewan Bahadur now Sir M. Ramachandra Rao Pantulu Garu the Union is specially grateful, for at considerable personal inconvenience, he consented to preside at a short notice. To Mr. S V. Ramamurti the Union owes a deep debt of gratitude for the many acts of kindness during his tenure of office. To Rao Bahadur D. Ananda Rao who first as Principal and later as Director has been evincing considerable interest in the affairs of the Union our thanks are tendered. To all those gentlemen and ladies who as conveners and members of the various committees, rendered us help in many ways our grateful thanks are herein recorded.

THE REPORT OF THE MANAGING COMMITTEE. *

The Managing Committee beg to present the following report of their activities during their tenure of office from Dec. 1934 to August 1935.

At the outset the Committee wish to state, not as an apology to their shortcomings, but as a mere statement of fact, that they had very little time to settle down, since the interval between the last College Day and Conference and the present one has been a very brief one.

Meetings. There were 8 meetings of the Committee during the period, chiefly in connection with the passing of accounts and the celebration of the 24th College Day and Conference.

* Presented before the general body.

Vacancies. Consequent on his promotion as Assistant Director of Agriculture, Salem, Mr. V. T. Subbiah Mudaliar resigned his secretaryship in the month of June 1935 and Mr. C. S. Krishnaswami was elected by the Committee in his place. Mr. S. M. Kalyanarama Ayyar was elected as Committee member in the latter's place. The Managing Committee take this opportunity to place on record their appreciation of the services rendered by Mr. V. T. Subbiah Mudaliar as Secretary of the Union.

The Journal. The conduct of this activity was as usual entirely in the hands of the Editorial Board. It is pleasing to record that the Madras Agricultural Journal has now firmly established itself as a periodical of high standing. The issue of the journal has been regular and the Editorial Board have faithfully kept up the standard set up in previous years. The Committee are glad to learn that there has been a good response from the mofussil as well as the Research Institute.

*Finance.** The Auditor's Report and the Financial statement are before you. They cover a period of 12 months from June 1934 embodying the accounts rendered by two successive committees—this and the previous one, the financial condition of the Union cannot be said to be very satisfactory. The cash balance of the Union was only Rs. 873—4—0 on 31st May 1935 when the accounts were audited. This, the Managing Committee, beg to point out is due to the large amount of arrears outstanding against the resident members of the Union which if it had been realised before May 1935 would have found entry as income in the Balance Sheet.

The Rama Sastrulu Munagala Prize. The Committe regret that owing to the very brief interval between the two successive College days they were unable to call for papers and therefore no prize has been awarded this year.

The General Body Meetings held in December 1934. The Annual General Body meeting was held in the Freeman Building under the Presidency of Rao Bahadur D. Ananda Rao Garu when the Annual Report for the year 1933—34 was adopted and office bearers for the year 1934—35 were elected.

The Committee's thanks are due to M. R. Ry. Rao Bahadur D. Ananda Rao Garu who as Principal and later as Director of Agriculture evinced considerable interest in the affairs of the Union, and to Mr. R. C. Broadfoot, Principal but for whose great interest in the Union, the Managing Committee would not have been able to conduct the College Day and Conference at such short notice.

AGRICULTURAL INDEBTEDNESS

By Rao Bahadur K. S. VENKATARAMA IYER

The ever-increasing indebtedness of the agriculturists of this Presidency as well as other Presidencies is a problem which has been engaging the attention of the Provincial Governments and Indian States.

Various causes have been contributing to this state of affairs. The world-wide economic depression, the low price of paddy and other produces of the land and the small margin left to the landholder are among the chief causes that have brought about this chronic indebtedness. The standard of expenditure even in rural families had been gradually rising as the prices were rising; and that scale of expenditure could

* Will be published in the next issue.

not be reduced when the prices fell down. The modern methods of eating and drinking which replaced the cheap and healthy diet adopted for centuries could not be given up for cheaper and healthier diets. As an example, coffee and tea-drinking costs as much as the ordinary meal of every family and coffee and tea have not fallen in price. The general effects of smaller income and higher expenditure can be seen in the increasing indebtedness and the result is the passing off of the lands from the hands of the landholder into the hands of the money-lenders, several of whom do not want the lands; but the lands are thrust on them through court sales. The consequence of such transfer of ownership from the man on the spot to the resident of the town or city is that the lands are let for the mere collection of rent and the lessor looks only to collect whatever he can and the lessee to get whatever income he can get without caring to maintain the fertility and the productivity of the land. In course of years the land gets deteriorated and whatever improvements the Agricultural Department were able to make are being gradually set at nought by the absentee landlords.

Government appointed Mr. Sathianathan as a Special Officer to enquire and report on the indebtedness of the agriculturists; his report has been or will be sent to Government for action. Some of the Provincial Governments and the Indian States have already taken action. The creditors want their money back and not the lands offered as security or attached for the debts and the debtors wish to retain the lands to enable them to repay the debts in easy instalments at a reasonable rate of interest. The only solution lies in the Government guaranteeing repayment to the creditor with 4 or 5 per cent. interest, the debtor being asked to pay with one per cent. more (to cover the Government's expenditure on establishment etc.). Government can, by legislation, hold the lands owned by the debtor as security. Government in helping the debtor should not be made to lose: I will suggest Government valuing the lands at 20 to 30 times the assessment of the land and can guarantee repayment upto 60 per cent. of the value of the land calculated on the basis of the assessment. If this remedy be adopted, the landholder will begin to work earnestly as he has hopes that he can gradually repay his debts and redeem his lands.

It may be said that the various Primary Banks which are being financed by the Central Land Mortgage Bank will go a great way to relieve the indebtedness. The rules and restrictions framed for the working of the Banks are such that they are not really useful to the land-holders who wish to be benefited by the Mortgage Bank. Under the rules no borrower can apply for and borrow more than Rs. 5000 and the borrower should not be indebted to the extent of more than Rs. 5000. There have been several instances in which a landholder who is a creditor to an extent of Rs. 20,000 from smaller landholders

from whom he cannot recover cash but only lands and who has had to borrow money for marriages in his family and for payment of debts incurred for the improvement of his estate relying on his outstandings; and such landholders cannot take advantage of the help offered by the Land Mortgage Banks.

Hence a landholder who pays an assessment of Rs. 2000 a year, i. e., who may be said to own lands worth Rs 50,000 at least and who has to recover in cash Rs. 20,000 from his debtor cannot utilise the Land Mortgage Banks if he has liabilities of over Rs. 5000. In these days of depression and low prices a small landholder will not be able to spare enough towards the repayment of instalment after maintaining his family, which is generally large. It is the will of God that a poor man is blessed with a large number of children as compared with a wealthy man who is often without children. I do not say that the smaller land-holder should not be helped. What I urge on the attention of the authorities is that the larger land-holder also should be helped, provided that the authorities are satisfied that the security offered is sufficient and that the borrower can be relied on for regular payments. Government can provide sufficient safeguards in the matter of granting loans of over Rs. 5000. The management of the banks can be entrusted with grants of loans up to Rs 5000; and loans of over Rs. 5000 can be granted if the loan is recommended by the Revenue Department Officer of the division. The officer can be expected to know the borrower within his division and can be expected to be careful in making his recommendation. Government evidently fixed the maximum of the loan to Rs. 5000, to avoid big loans being granted to influential and wealthy landholders to the detriment of the smaller applicants. It is the duty of Government to equally protect the larger landholders who have during recent times been taking an interest in improved methods of agriculture. Thus the slicing away of big estates could be prevented by Government. Government had been trying even to legislate in the matter of the consolidation of holding to enable better management of the lands; but this increasing indebtedness has gradually broken up the holding, as small pieces here and there have been and are being sold to relieve the indebtedness.

If a census is taken of the sales of land from statistics of the last 5 years, to be collected from the Registration Offices it will be clear that big holdings are being gradually broken up and that the lands are passing on to the hands of absentee landholders. Indian States like Travancore are taking immediate and practical steps to relieve the distress of agriculturists. It is the duty of our Madras Government to adopt early measures. Let not the doctor be called in after the patient is past recovery.

I have avoided discussing if the landholder can save anything after paying the assessment for which a large share of the yield has to be sold

on account of low prices and low yield. That the yield is lower than what was originally fixed at the time of settlement of 1893 which has been adopted at the settlement of 1923 is a fact which can be proved beyond doubt. The gross yield fixed at 1893 may have been fixed on a correct basis: the causes for the lower yield should be found out by experts of Government after verifying my statement if needed. These are however matters which should be put forth elsewhere than in a Government College function presided over by the highest Revenue Official of Government.

Discussion.

The President referred to the forthcoming Bill in the Legislative Council, and observed that the Agriculturist's Loans' Act would go a long way to relieve indebtedness. The point according to him was that with the finances of the Government limited, a larger number of smaller debtors could be benefitted with the finances available, and this was a more desirable thing than helping the bigger debtors.

Rao Bahadur K. S. Venkatarama Iyer said that he only wanted the restrictions under the Mortgage loan to be slightly relaxed. He also suggested that Government might raise a loan and then finance the bigger debtors and thus in addition to helping them, might also earn a profit.

Mr. Sanderson speaking of his experience in a village in Coimbatore District, remarked that barring half a dozen people who had debts of Rs. 1000 and more all the debtors in the villages were those with debts of 500 and less, and in his opinion, they were the people in need of immediate relief.

AGRICULTURE AS A PRACTICAL PROPOSITION

BY C. S. NAMASIVAYAM PILLAY

The great Tamil sage Thiruvalluvar, in his immortal couplets called *Thirukural* has said

"சுழன்றும் ஏர்ப்பின்னது உலகம் அதனை
அழுந்தி முழுவே தலை"

meaning

"The world revolves behind the plough, hence
Ploughing is foremost in spite of difficulties."

The truth of this statement was well realised by the industrial nations of the West a short while ago. During the last two centuries, western countries vied with one another in industrialising themselves. Industries sprang up in quick succession, resulting in the concentration of population in the cities. Villages were deserted. As a natural consequence, most of the lands had to remain fallow for want of cultivators. These industrialised countries were getting their supplies of food from foreign countries. But when communications were interrupted during the War, these countries were threatened with starvation, as local production was absolutely insufficient for their needs. Then they began to raise the cry of 'back agriculture.' They realised that it was necessary to give the most prominent place to agriculture in all their national enterprises.

The slogan of "back to the village" is repeated in our country also from almost every platform by almost all men of position, culture and influence. It is declared to be the only remedy for all the ills of our country. 'Back to agriculture' is more easily said than done. Precept without being preceded or followed by example is never valued by anybody in any clime. The advice is generally given by men in high position, whose only qualification for giving it is their eminence in life, and probably their possession of extensive areas of lands. If an enquiry were made, it would be found that every inch of their land is either leased out to others to cultivate, or large portions of it lie waste for want of a husbandman. If agriculture is really profitable, have they taken up to agriculture themselves, or at least have they made their sons to take up to agriculture? If not, why not? Have they at least given any practical help to any one to take up to farming? To all appearances, it seems that the advice is intended to be followed only by others and not by themselves.

Now, let us examine how far this criticism is justifiable. To quote again from Thiruvalluvar,

"இல மெனன்றசைஇ யிருப்பாயிரக்காணி
னிலமெனன் று நல்லா ணைகும்".

meaning

"Seeing one idling for want of work
The good woman called land laughs".

To explain more fully, 'when a man says that he has been idle for want of an occupation, the good woman called 'land', laughs at him. Why! Because it is she who gave birth to him and she is always there to give food to any number of her children. When a child is in need of milk, it has only to go to the mother to be fed with milk. When a man complains of starvation for want of occupation, it looks as though he has forgotten the existence of the mother 'Earth' who naturally laughs at the extreme ignorance of the man.

There are hundreds and thousands of acres of land lying idle without anybody to tap their resources. These are either assessed waste lands of Government or proprietory waste lands In one of the most fertile taluks of the Presidency, viz., Periyakulam taluk, there are over 20,000 acres of assessed waste lands. It is the richest taluk in the Madura district. It is the taluk where the famous Cumbum valley is situated. It has the benefit of both the monsoons. Its climate is very salubrious. And yet such a huge area is lying waste, not to speak of the proprietory waste lands. I believe that almost every taluk in the Presidency has a similar large area under waste. We may therefore safely take it that land is available for those who care to take it up. He who cares can get an assignment of Government waste lands, or purchase then from those who might part with them for a consideration or can take them on lease from those who own them.

The second of the two things necessary to start a farm, is, capital. In this connection, it is necessary to point out that parents would be well advised to take cognizance of this problem before they invest money on their children's education. If education is intended purely to attain culture, cost does not certainly count. It has to be acquired at any cost. But if education is intended to be only a means to a living, then certainly the cost of education should have a proportion to the results of the education on the practical side. Also it should have a bearing on the ability of the parent to pay. There have been cases where the parents spend their all on the education of their children. They exhaust themselves so much that they do not have anything to give their children a start in life There have been cases where graduates in law have to accept a salary of Rs. 15, merely for want of capital to set up practice or to sustain themselves till they secure a suitable job. Hence the parents have to take care that there is something with them, as far as practicable, to enable their children to make a start in life. Thus, those educated young men who can rely on paternal property can easily find their capital. But in most cases, parents are unable to set apart any capital inspite of their best efforts. For it may be that his income is too poor to set apart anything or that he has too large a family to support. How can these young men secure the necessary capital? Capital in these days seems to fight shy of agriculture. In ancient days money-lending was not a profitable business, because it was considered to be a crime to collect heavy rate of interest. Similarly, trade also was not quite so profitable. For, it was considered also a crime to sell at more than a reasonable price, irrespective of the demand and supply. Since there is no such restraint now on money-lending or trade, money flows to these two channels, which give a much easier and quicker return than agriculture. But such of the money lenders as lend money to agriculturists do so only at usurious rate of interest. It is a notorious fact that the Rural Co-operative Credit Societies which were intended to finance the agriculturist really work as a mill stone round his neck, rather than as a buoy to help him out of deep waters. For they issue mostly short-term loans which cannot serve as working capital for investment in agriculture. These short term loans on the other hand tempt the agriculturist, to incur expenditure without enabling him to repay the loan easily. Coming to the much advertised Land Mortgage Banks, it appears that only the wealthy can approach it. For, in practice, one has to mortgage Rs. 10,000 worth of property to enable him to obtain a loan of Rs. 1000. Added to this, the ordeals one has to undergo before and after obtaining a loan would forbid any reasonable man from entangling himself in the meshes of those rules. The Land Mortgage banks help only the rich landed proprietors and not the poor agriculturists who are trying to make a living out of waste land. In fact, the Land Mortgage Banks appear to have been conceived more as a means of safe investment of

overflow capital than to help the needy agriculturist. By this I do not mean to say that the interest of the investors should be neglected. I realise that for the successful working of the bank, it has to create confidence in the mind of the investors. My only complaint is that an equal attention has not been paid to relieve the distress of the agriculturists. Coming to the State Bank, viz., the Imperial Bank, agriculture is out of the purview of its operations, except probably the plantations on the hills. Coming next to the Government loans, issued under the *Takkavi* Loan Rules, it is true that the rules have been framed in the most liberal spirit. Worked in the proper spirit they ought to give a good deal of relief to the agriculturist. But unfortunately the Government machinery is such that in the actual working, it helps only a negligible few.

This is the actual state of affairs at present. Let us now examine whether, given the necessary land and capital, agriculture can be a good means of livelihood for the educated unemployed. Before proceeding to examine the value of agriculture as a profession for the educated unemployed it would be interesting to find out how far other walks of life generally chosen by them at present, do really help them. They are (1) the legal and medical professions (2) the Government service (3) Local Board service and service under similar quasi-Government institutions. Taking the legal and medical professions, it has to be admitted that with a few exceptions these really form good sources of income to the educated. But there is a limit to the number of men who can enter these professions. Hence these can afford employment only to the fortunate few. The Government and Local Board Services, provide good income to those who occupy the upper berths which can necessarily be only be given to a few. The vast majority of those who enter these services, do not have the necessary means to put by something for even their ordinary expenses, such as marriage and education of their children. In most cases, men in these Services find it difficult even to make both ends meet. Generally, they are able to pull on so long as they are alive. In the event of their death, the condition of their wives and children becomes most pitiable. Having been in service, they have become accustomed to an artificial life, which would neither permit them to adopt the simplicity of the farmer nor would it give them enough courage to brave the situation. The children suddenly find themselves left all alone to their own resources with nothing to help them. They find themselves both unwilling to go to the village and unfit also to lead a village life. They have lost all touch with the village. They have naturally to find out some means of livelihood in the town itself, however low may be the income. They naturally curse their parents for not having left enough property, to enable them to live in the same comfort as they did during the life time of their parents. It is true that there are some parents who insure their lives, so that on their death their children get

something But this does not go very far to help them. An ordinary member of any of these services cannot insure for more than Rs. 5000. If he has half a dozen children, this Rs. 5000 is very small indeed to be of much help to them. Thus it will be seen that the vast majority of the educated men have to go without making a decent provision for their children.

Let us now see whether agriculture offers them a better prospect. If we suppose that an average man in service gets an income of Rs. 150 and retires on a pension of Rs. 75/-, what would be the requirements for a farming profession to obtain the same income? From the statistics available at the various Government farms, it may be computed that the average net income from an acre of garden land is Rs. 100/- even after allowing a margin for all contingencies, like insect and fungus attack, unfavourable seasonal conditions etc.

Thus to enable one to obtain the same income as in Government service, one has to do 20 acres of garden farming. But this is only a very modest estimate. By intensive farming and adopting prudent methods of management and marketing, it is possible to obtain the same income from 10 acres of garden. Instances are not wanting where an acre of land has been made to yield a thousand rupees. But leaving alone these phenomenal cases, it may be safely assumed that 20 acres of garden land is the normal area required to obtain the required income of Rs. 150 per mensem.

The cost of sinking a well in a dry land under normal conditions would be about Rs. 1000. Purchase of two pairs of cattle, maintenance of cattle for one year, construction of cattle shed, purchase of implements, seeds, manures etc., hiring of labour permanent and casual, construction of a small hut for the owner of the farm, maintenance of the owner till the farm begins to yield and a margin to meet unforeseen expenditure would require a sum of Rs. 2000. Thus with a capital of Rs. 3000 the farming can be started. But the provision here made is only for conversion of 10 acres into a garden. The remaining 10 acres have to be brought under garden cultivation only from the income obtained from the first 10 acres. It would take 7 to 10 years to bring the whole area under garden cultivation. With a capital of Rs. 5000 the whole area can be brought under good yielding garden conditions within 3 to 5 years. Thus in any case, after 10 years, the income from the farm is Rs. 150 per mensem. Here I wish to point out, that while a man in service reaches an income of Rs. 150 only during the closing years of his service, the man taking to farming gets that income within 7 years of starting his work. But the more important point to be mentioned is the fact that while a man in service drawing a salary of Rs. 150 at the close of his service and retiring on a pension of Rs. 75 does not leave anything to his family to inherit, the man who takes to farming leaves a fine garden of 20 acres yielding

a permanent income of Rs. 150 per mensem. In fact, if a man who enters service dies after 10 years, his family becomes penniless, while the family of the educated farmer is well-provided for, by this period.

It will thus be seen, that farming is far more profitable than service and provides a decent income to the educated, quite comparable to other walks of life. In other walks of life also, the average income is not very much more than Rs. 150 per mensem. There also, it is not possible for one to save within 10 years enough capital to purchase 20 acres of garden land. Hence it may safely be asserted that agriculture is the most profitable and the most prudent of all professions, which all educated young men can take up.

Let me also appeal to those who are in a position to do so to find ways and means to help the educated young men with land and money. More than all, it is the Government who ought to find the necessary means to divert the energies of the educated youth into such useful and fruitful channels. But the way to achieving the desired end lies in financing the enterprise. To make a beginning, let such of those alumni of this College who are not absorbed in the Department, or who seek to retire from Service be helped to run a farm of their own. The provision may be extended to other educated men later, if it cannot be done immediately. The matter of spreading the improvements among the ryots would then become an easy problem.

Discussion.

Rao Sahib T. V. Rajagopalachariar endorsing the views of the author, said that he knew of large tracts in South Tinnevelly fit for colonisation In his opinion, three things were necessary for such colonisation. (1) People must take some risks. (2) necessary capital in the beginning must be furnished by the State and (3) a bias towards agriculture should be cultivated, by introducing school gardening as a compulsory subject in schools.

Rao Bahadur D Ananda Rao remarked that the figure of Rs. 100 profit per acre mentioned by the author was rather high-pitched and for his part he would consider even Rs. 50 a very good income. He wished to know, why people do not ask for the land, 20,000 acres of which, according to the author were available in Periyakulam. As regards introducing school gardening as a compulsory subject, he said the idea was not practicable at this juncture, because there were not enough trained teachers to teach the subject.

Rao Sahib N. S. Kulandaiswami Pillai mentioned about an area of 40000 acres in Perambalur Taluk, proposals for colonising which, Government were not prepared to finance, on the security of land alone. He instanced the example of Mysore, where loans were advanced to settlers cultivating new lands under departmental supervision and observed the example might be followed in Madras also.

Rao Bahadur K. S. Venkatarama Aiyar. Observed that the reason why people do not ask for new lands, are that Government not only assigns such lands, but even assess them, which people are not prepared to pay at least in the beginning.

Mr. K. Ramiah referred to the only instance in the Punjab, brought before the meeting of the Board of Agriculture, of successful colonisation. He said conditions in the Punjab and Madras were different, and remarked that in addition

to area being available and cultivable, facilities for cultivating them also must exist.

Mr. A. K. Annaswamy said that the impeding factor was not lack of bias, but lack of courage. He appealed to retired officers of the Department to set an example, by colonising.

Mr. V. Suryanarayana said that the necessary bias to school children, would be given by employing agricultural graduates in the Educational Department.

DETERIORATION IN THE QUALITY OF CAMBODIA COTTON

BY V. RAMANATHA IYER,

Cotton Specialist.

Recently the attention of the Department was drawn by the Secretary, Indian Central Cotton Committee, Bombay, to an impression gaining ground among a certain section of cotton trade and mill industry in Bombay that, of late, the quality is steadily deteriorating in Southerns cotton, in which Cambodia exported from Tirupur, Coimbatore, and Pollachi has also been mentioned. Such an opinion is rather unexpected in view of the fact that cotton is one of the crops to the improvement of which Government are ever paying the greatest attention. Amongst the several measures taken in this direction during the past 15 years or more, may be enumerated the evolution of high yielding strains like Co. 2, arrangements for the rapid multiplication and sale of the seed of these improved types to the growers, the enacting of the Cotton Pest Act against the spread of cotton pests causing damage to both quality and quantity, the passing of the Cotton Transport Act against the import of inferior cottons into tracts where cottons of quality are being grown, the enforcement of the Cotton Control Act which penalises the grower of low grade cotton in such tracts, the introduction of a Market Act for the securing of better prices, and the insertion of certain clauses in the Cotton Ginning and Pressing Factories Act to prevent inadvertent mixing.

Enquiries were made of the growers, exporters and consumers of this cotton in this Presidency on the alleged fall in quality. An analysis of the replies so far received revealed that the report was not unanimous. Some of the mills declared that they had no reasons to complain, and were, on the other hand satisfied with the gradual improvement noticed.

A study of the past history of Cambodia in Madras shows that the cry of deterioration is nothing new and is being raised periodically. Cambodia cotton entered India about 1905. It came to be grown in commercial quantities in 1910. Deterioration of quality was first expressed in 1914 at the time of the Trade Conference convened by the Government. The cry was repeated before Mackenna's Cotton Committee in 1918 and at the time of the enaction of Cotton Transport

Act in 1924 and again at the time of its revision in 1928 and now in 1934. This short note is presented with a view to discuss how well or ill founded are such complaints.

Now deterioration in the quality of any cotton is felt when its staple falls below its average, when there is a greater proportion of immature fibres causing nep, when the fibres get coarser, when the colour is spoiled and when a greater variation in these characters occurs in the samples. The chief causes that are said to contribute to the existence of these conditions are :—

1. Degeneration of the strain either by the play of natural selection or by the incidence of a greater extent of natural crossing.
2. The cultivation of varieties in places unsuited to their growth.
3. Staining by pests.
4. Premature picking and
5. Prevalence of malpractices.

1. Degeneration of the strain. A pure strain may wear out on account of the stress of natural selection. When any culture is declared pure, it has to be understood that it is pure only for the characters studied. In cotton, purity is generally considered in lint length, seed and lint weights prior to the distribution of a strain. It may be impure for other characters. It is a well recognised phenomenon in plant genetics that the expression of a character is dependent on the nature of the genetic background Absence of purity in other characters may bring about in course of years alterations in the genetic back ground which may affect the proper manifestation of the pure characters. When the trend of lint length of Co. 2 is examined (Table I) no decline is perceptible. Reports received from the local mills confirm it.

Table I

Year	Mean fibre length (inch)	Highest Standard Warp Count
1924—25	0 92	29's
1925—26	0 92	25's
1926—27	0 91	37's
1927—28	0·88	33's
1928—29	0·92	26's
1929—30	0 90	28's
1930—31	0·92	29's
1931—32	0·90	27's
1932—33	0·92	24's
1933—34	0 88	26's

Apart from this, a superior cotton may go down in its spinning performance on account of hybridisation with inferior types present in the bulk material. Seeds of improved types are being distributed by the Department since 1920. It can be safely stated that a very large portion of the total area of 4·5 lacs of acres under Cambodia

cotton in this Presidency is being sown with these seeds. Further the cultivators of this Presidency are not yet in the habit of sowing deliberately a mixture of Cambodia and indigenous cottons except on a small area near Virudunagar. Cambodia will not hybridise with any local cottons even if mixed and sown. Bourbon is the only American cotton raised in the protected area but it is being grown mixed with *Nadam* and the chances of Cambodia getting crossed by Bourbon are very remote. It will thus be seen that there is no deterioration in both the directions. The plant material is quite as good as it was in 1925.

2. **Difference in cultivation.** There is a general feeling amongst a large section of traders and mill owners that the cotton has deteriorated on account of indifferent cultivation on unmanured soils with bad rotation. As far as the records of the Cotton Breeding Station go on this point, differences in nutritional conditions in the soil do not induce any decline in the spinning value of Cambodia cotton. (Vide Table II). The information given under irrigation needs some explanation. The little difference in spinning values noticed between rain-grown and irrigated cottons should only be interpreted to mean that the rainfall during the years was sufficient to maintain the normal spinning values. It should not be taken that differences in precipitation had no effect on lint length and fibre maturity. It has been proved beyond doubt that lint-length-development is highly influenced by the availability of moisture in the soil during the lengthening phase, and sudden aridity after the cessation of rains makes the fibres show more of neppiness. Another point to which I wish to draw your attention is that rain-grown cotton may

Table II. *Spinning Value. Highest warpcounts.*

Time of Sowing Expt.			Manurial Trial.			Irrigation Expt.			Rotation Expt.			Spacing Experiment.			
Treatment	1927 -28.	1928 -29.	Treatment	1928 -29.	1929 -30.	Treatment	1932 -33.	1933 -34.	Treatment	1932 -33	1933 -34.	Treatment	1930 -31.	1932 -33.	1933 -34.
Early	34'	34'	N	31'	29'	1 Week	29'	28'	Cumbu	32'	34'	4"	29'	31'	29'
Late	34'	32'	N+P	31'		2	32'	29'	Cholam	30'	32'	9"	„	30'	29'
			No manure	31'	28'	3	31'	29'	Ragi	30'	30'	12"	27'		
			N+K	31'	„	Dry	32'	29'	Ground-nut	32'	30'	Broad-cast		31'	28
			N+K+P	31'	28'				Fallow	31'	30'				
			Green-manure		29'				Green-manure	32'	33'				

show the same spinning quality as the irrigated, and yet will contain greater neps in the yarn which is disliked. Deficiency in rainfall and its bad distribution will no doubt lower the quality of cotton. In as much as the rainfall curves for the past 10 years do not show any steady decline, the reported deterioration cannot be laid at the door of

deficient rainfall. Moreover, the percentage of irrigated to the total has not gone down to suggest that the greater proportion of rain-grown area has enhanced the ratio of inferior kind. (Table III).

Table III *Area of Cambodia.*

Year	Coimbatore Dt.		Madura Dt.		Salem Dt.	
	Total area in hundreds acres	Percentage of area under irrigation	Total area in hundreds of acres	Percentage of area under irrigation	Total area in hundreds of acres	Percentage of area under irrigation
1926—27	1224	64	713	38	522	34
1927—28	1325	70	515	38	465	27
1928—29	1627	66	860	45	530	31
1929—30	1734	62	840	26	650	21
1930—31	1266	57	706	26	384	29
1931—32	1432	68	572	38	414	37
1932—33	1552	70	481	41	640	33
1933—34	1723	71	624	40	492	42
1934—35	2222	66	1094	32	834	41

3. **Staining by insect pests.** Insects like the pink boll worm and the dusky cotton bug may spoil the *kapas*. Their effect is more perceptible in the later and the summer pickings. Dr. Ramakrishna Ayyar, Govt. Entomologist says that there are no grounds to think that their incidence has increased to any extent during the past 10 years. On the other hand the practice of allowing Cambodia for *kar* picking is gradually being given up due to the operation of the Pest Act. Such a trend should tend to improve the quality of cottons as a whole.

4. **Premature picking.** As far as I am aware there has been no change in the system of picking cotton in this Presidency and hence no deterioration should occur on this score. It is however reported that there prevails in parts of Salem district a practice of collecting all mature bolls before they open and removing the *kapas* as the bolls dry. A preliminary examination of the fibre properties in such cottons has not revealed any striking difference. The proportion of immature fibres has remained unaffected. It would signify that the collection is being done only during the drying stage after the completion of the thickening phase of the fibre.

Table IV.

		Normal picking.	Premature picking
Percentage of ripe fibres	...	58%	55·7%
Germination capacity	...	86%	77%
Seed weight per seed	...	114·4 mgs.	108·4 mgs.
Lint weight ,,	...	57·5 ,,	52·9

5. **Prevalence of malpractices.** This is generally the most potent contributor to deterioration in quality. Amongst the several malpractices that are commonly carried out, watering the *kapas* a few

days before their sale and the lint prior to pressing, and deliberate mixing with inferior cottons are the two that will depreciate the quality of lint. It may be stated that much grievance has not been expressed with regard to the presence of excessive moisture in Cambodia bales. The abuse has not yet seriously caught the imagination of the sellers of lint. It is reported by the exporters that the average percentage of moisture found in Indian cotton bales is lower than in foreign cottons.

It has to be admitted that mixing with inferior cottons takes place in the Cambodia tract and it cannot, I think, be stopped until legislative action is taken on lines somewhat similar to those in vogue in Egypt. But a number of complexities have to be solved before we think of that action. There are however no definite evidences to indicate that mixing is being perpetrated on a larger scale than before. If that is the case, the total quantities of lint under *Karunganni* (G. indicum) *Uppam* (G. herbaceum) and *Nadam* (G. obteesifollun) should show a smaller return corresponding to the increase felt under Cambodia. Unfortunately this could not be tested from the records now available.

Mixing is made possible by the presence of a number of inferior cottons like *Nadam* and *Uppam* in the protected area and by the defect in the Transport Act which does not control the movement of cotton by road. The difficulty with regard to the first is that Cambodia does not thrive well in all the soils and naturally the inferior cottons which possess certain agriculturally useful characters are being grown in the absence of better types. It is only recently that attempts are set on foot to evolve better types that can replace them with benefit. A strain with the spinning quality of *Karunganni* and the drought-resistant quality of *Uppam* has been evolved this year on the Cotton Breeding Station, Coimbatore. It is hoped--one cannot be certain here as it is extremely difficult to exterminate the indigenous types--that the short-stapled cotton will be replaced by this strain so that the mixture even when carried out will not show the wide variation now exhibited in the samples.

Moreover, the Secretary, Indian Central Cotton Committee is right in the presumption that there is scarcity in the first quality cottons in the markets, as they are being purchased with greater avidity by the local mills that are increasing rapidly in numbers during recent years in the Coimbatore District for the spinning of higher counts, and that only cotton of second grade is available for export. The proximity of these mills to the growing centre, their greater local knowledge, and the practice of ginning their *kapas* in their own gins enable them to offer higher competitive rates for good types which the mills in the North cannot afford.

Storing the bales in open plinths, defects in ginning and mechanical injury which the fibres may undergo under compression, are also other factors affecting the quality. But these are not novel introductions.

It will thus be seen that all the probable factors of deterioration of cotton are not more operative now than what they were 15 years ago. There is another strong evidence to prove that they are not. Arrangements have been made between Technological Laboratory, Bombay, on one hand and the Mill Owners' Association, Bombay and

Table V. *Yarn test results – Count strength product.*

Year	Cambodia samples obtained rom		
	Cotton Breeding Station	Mill owners' Association	East India Cotton Association
1929—30	1381	...	1392
1930—31	1416	1409	1613
1931—32	1342	...	1516
1932—33	1258	1297	1351
1933—34	1383	1409	1429

Ahmedabad and the East Indian Cotton Association, Bombay on the other, according to which trade samples of each crop of cotton every year are being supplied to the Technological Laboratory for the conduct of spinning tests. The results of Cambodia samples obtained from these authoritative bodies are given in Table V, along with those of the standard Co. 2 samples sent from the Cotton Breeding Station, Coimbatore. If really there is deterioration in quality, it should be reflected in these samples, but the count strength products are practically the same. This is perplexing. It looks as though the cry of deterioration is ill-founded as far as the available information warrants.

There are however a few features which are to be borne in mind in this connection. There is a tremendous fluctuation in lint lengths from year to year even in a pure strain cultivated carefully, due to the changes in the season and of places, in addition to those existing between different pickings of the same crop, plants in the same picking, bolls in the same plant, seeds in the same boll and fibres on the same

Table VI

Cambodia grown at	Mean fibre length (inch)	Mean fibre weight Per inch (10^{-6}oz)
Tiruppur.	0·97	·142
Gobichettypalayam.	0·94	·134
Dharapuram.	0·93	·145
Salem.	0·88	·148

seed. Table I shows the variation found in the staple length of Co. 2 for the last 10 seasons on the Cotton Breeding Station, Coimbatore. Table VI shows variation caused by growing a strain at different places. I am fully alive to the fact that traders are fully aware of this feature. But I do not know whether in their estimates sufficient allowance is being made by the traders for this source of variability. For instance, Cambodia Co. 2 is declared by the Director, Technological Laboratory, Bombay, as one of the most variable cottons with regard to its spinning performance, the coefficient of variability being 13·2. It is likely that the mental picture which the graders are having for the annual variations in this cotton may be only say 4 % and anything more than that may be attributed to deterioration which may after all pertain to annual variation.

When a cotton is grown in commercial quantities, its average length will be shorter than its record when it was first grown carefully in smaller areas. If the performance of Cambodia soon after its introduction was higher than what it is now when it is being grown over several lacs of acres, the fall in length should not be attributed to deterioration.

The spinning values do not always vary with differences in staple length, although lint length is, according to the findings of Dr. Turner, the single factor that bears highest correlation to the spinning value of Indian cottons. It will be seen in the statement that there were years where the lint length was on the short side and yet the spinning value was high. This is indicative of the fact that the effect of certain changes in the environment is not always the same on the fibre length and spinning value. Any inference of deterioration in the quality based on the temporary fall in lint length alone may not be correct.

In years of low prices greater attention will be paid to the quality than in years of high prices when greater interest will be evinced in quantity and flaws once overlooked assume comparatively greater importance.

Any of these might have helped to a larger extent for the formation of the opinion about the deterioration in the quality than the direct contributory factors mentioned above.

I shall be glad to have the benefit of your experience on the matter.

AGRICULTURAL METEOROLOGY IN ITS RELATION TO INSECT PESTS

BY T. V. RAMAKRISHNA AYYAR, B. A., Ph. D.

AND

K. P. ANANTANARAYANAN, B. A., (Hons).

Introduction. In India, the study of Economic Entomology on scientific lines may be said to have been started from 1903 when the Department of Agriculture under the Central and Provincial Governments were re-organised. During the past three decades, the main work in connection with Entomology was confined to Agricultural Entomology and consisted in a sort of survey of the pests—major and minor, the comparative incidence of the different forms with the extent and nature of loss caused, studies on the important phases in the life histories and habits of some of the more important ones, some observations into the bionomics of some of their natural enemies and, finally, the adoption of such control measures as have become possible. In fact, in spite of our meagre knowledge of the ways of several of these insects, it was the last item on which greater attention had to be paid for obvious reasons. It is believed that, with some valuable data so far collected, the time has now come to enter upon another important phase of the work which might lead both the farmer and the Economic Entomologist to adopt prophylactic and direct methods of pest control which might supplement or even replace with advantage those which are now in vogue—; one such important line of work appears to be the investigations on the various relations existing between the insects on the one hand and weather and climatic conditions on the other, the two latter constituting what is popularly known as the science of Meteorology. That a knowledge of weather conditions is in certain cases very necessary and in other cases very helpful to the farmer in his agricultural operations is well known to most of our agriculturists; but it is doubtful whether the subject has received sufficient attention from an Entomological point of view, in this country. An attempt is made in this paper just to indicate the influence exerted by meteorological conditions on some of our well known insect pests, the possible ways in which useful studies may be made of weather conditions in relation to insects and the convenient lines on which such a knowledge could be utilised by the farmer with advantage not only to forecast insect out-breaks but also to adopt prophylactic measures.

The Importance of the Relation Between Insects and Climate. The value of a study of Agricultural Meteorology in relation to insects (Entomoclimatology) will be found very useful to farmers in all areas where there are major insect pests appearing year after year

and causing serious damage to crops. Beyond the knowledge that one pest or other appears every year in various degrees of intensity, the farmer has hardly any definite ideas as to the why or wherefore of such phenomena though, of course, he has his own explanations expressed in such trite expressions as no rains, early rains, late rains, too much rains, no winds, unfavourable winds, etc. In practical experience, in most of the cases where pest outbreaks in large scale have been reported by ryots "we are constantly reminded—it is the weather" and it is often felt that "at an earlier stage of attack" even the available means of control could have been applied with maximum effect. But it is the very question of locating the outbreak at its earliest stage that is the most perplexing problem before us, more so in the case of an ordinary ryot. At every outbreak, whether a crop is affected seriously or not the plant tissue which is eaten away by insects is never made good, though, in many cases, the insects that cause the damage are destroyed by human or natural agencies at a later stage. There is in fact very little benefit derived (especially in the case of mass outbreaks of insect pests which appear once or twice a year only or only once in so many years) by simply destroying the insects in turn for the damage they have done to the crop. For really effective control of plant pests, the first appearance of the pest on the crop should be studied in detail and all measures meant to destroy it or check its multiplication should be adopted during the earliest generation of the insect. This will minimise injury to the crop and is better than attempting such measures at a time when the existence of the pest is known only by the ravages it has wrought on the crop. A knowledge of the nature of response of the insect to its environment and climate has been missed, for want of exact data on the microclimates of the crops and the insects concerned, and hence the particular circumstances under which an insect multiplies to become a pest, we are quite unaware of. The influence exercised by weather factors—chiefly temperature and humidity on the development and behaviour of insects—has been shown by several eminent scientists in the west, by means of elaborate tests and accurate data, but systematic work on insect ecology and the study of weather in relation to pest outbreaks, are only of recent origin. The results achieved so far, appear so encouraging that in the investigation of all modern entomological problems, the study of weather in relation to pest incidence has come to be considered as important as the work on the life history and bionomics of the insects concerned. In the Meteorological Conference in 1929, as well as in the latest International Locust Conference in 1934 in London, Uvarov, Gryse and many other entomological workers have laid special emphasis on taking microclimatic observations and studying the environment of insect pests.

Insects and Weather Conditions in South India. That weather and seasonal changes contribute a substantial share in shaping the

behaviour of various insects, has been frequently noted in the case of several of our insects and recorded in reports in connection with the numerous biological studies made so far. Mass sporadic outbreaks of the army worm on paddy (*Spodoptera*) every year in some localities or other, the sudden increase in the infestation of coconut palms by the caterpillar *Nephantis* or the sudden increase of the parasites on the latter during certain part of the year, the appearance of the paddy grasshopper (*Hieroglyphus*) in a virulent form during certain years in such distant places as Malabar in the south and Ganjam in the north, the rapid multiplication and the mass emergences of the Red hairy caterpillar (*Amsacta*) after the first rains in certain localities, the very high percentage of attack by paddy stem borer (*Schoenobius*) in certain rainfed areas as compared to other paddy growing centres, the equally surprising and phenomenal recent outbreak of the paddy borer beetle (*Rhizopertha*) in stored paddy in some of the southern districts during the years 1914–15 and recently in 1934, are but a few of the well known instances which clearly give us some indication of the relationships existing between pest outbreak and weather. The relations of insects to rain and bright sunshine are also striking. Often swarms of butterflies and locusts migrate and this has perhaps some relation to the existing or approaching weather conditions.

Beyond these experiences and references in the reports, there has been no definite records on the subject up to the year 1921 when the senior author published his "Crop pest calendars for the Madras Presidency." * In these calendars which consisted of three in number, the first devoted mainly to the pests of paddy, the second to regular pests of important dry crops and the third to sporadic pests appearing irregularly during certain seasons; a rough idea is attempted to be given of the approximate seasons in the year when particular pests appear in the important agricultural tracts of the Madras Presidency. Such calendars, prepared as a result of continuous observations and with the help of the accumulated experience of the previous years, might help us to roughly forecast the appearance of pests in future; but it must be admitted that we are in need of a good deal of further information as to why some pests do not occur at the expected months, why sometimes the outbreaks are weak, and why sometimes there occur serious outbreaks in unexpected quarters. There are thus several lacunae to be filled up in our knowledge, before we can be in a position to utilise such knowledge to supply accurate and timely predictions of insect outbreaks.

Local studies – Influence of weather on insect life cycle and outbreaks: Within the past few years, some of the various influences by weather conditions, (especially temperature and humidity on insect development) have been worked out, to a certain extent, by various

* Published as, Pusa Bulletin and also as Madras Bulletin No. 80. 1921

scientists, and for many a type, the optimum conditions, under laboratory rearing, have been accurately observed. In a similar manner, some preliminary data have been collected with reference to a few South Indian forms. In connection with the breeding of parasities onthe black-headed coconut caterpillar *Nephantis serinopa* in Malabar, in the case three of the parasites, viz., a Bethylid—*Paraseirola* sp., a Eulophid—*Trichospilus pupivora* and a Braconid—*Microbracon serinopae*, the effect of weather factors has been noted in a very conspicuous manner, interfering with or accelerating the development and activity of the insect at every stage. In brief, the Bethylid finds a favourable condition during warm dry weather and the Eulophid requires a wet cold weather for normal breeding and activities. Under laboratory conditions of given temperature and humidity, the Bethylid was breeding most successfully when a temperature of 80—85° F and a relative humidity of 70—80% was obtained while the Eulophid was at its best at conditions of temperature 78 - 82° F and relative humidity 92—94 Detailed observations on the latter are recorded in a paper by the junior author in 1934.* The third parasite *Microbracon* exhibited a totally different phenomenon, viz., yielding greater and greater percentage of males, finally producing no female specimens in the different broods, with the advance of the hot dry weather during three consecutive years 1928—31, though rearing was continued as during other parts of the year and though occasionally fresh specimens from the field were mixed to the lot in the laboratory. Given enough food and due care for rearing, the variations occurring in life periods of the different stages in life cycle, when continuously reared, are by themselves adequate proof of the influence of changing weather on the insect's life cycle. Also the same insect reared in distant localities of changed weather conditions shows such variations in the period of the life cycle, though reared at the same period. Such studies clearly indicate the time of appearance of the insects in nature or the best time for their introduction ; they also serve to interpret their behaviour in nature and to guage their usefulness or otherwise in pest control.

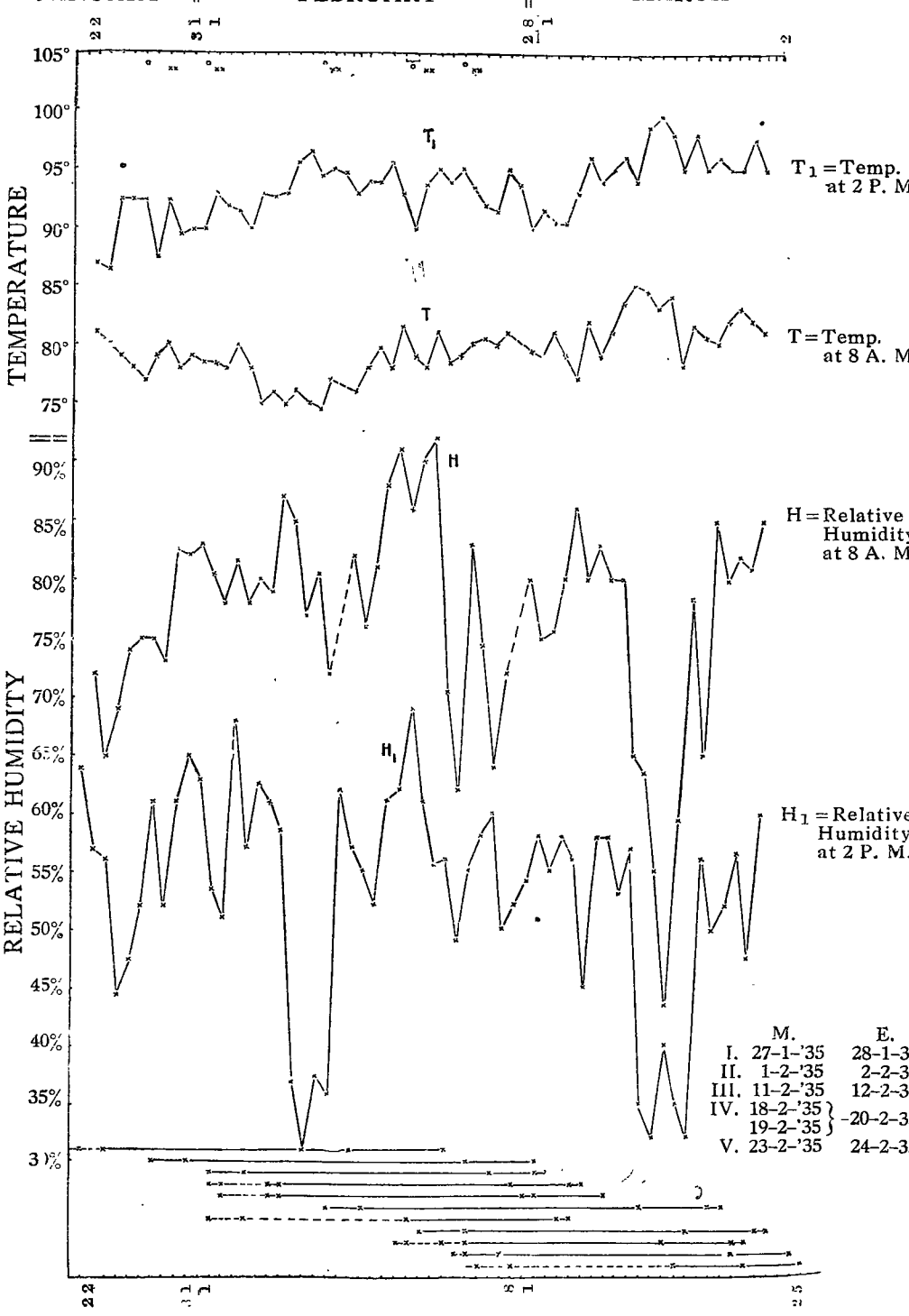
Similarly, in the course of more observations, on the incidence of two of the major pests of paddy, viz , *Spodoptera mauritia* and *Schoenobius incertellus* in the Presidency, during the different parts of the year, some interesting data have been collected, whereby it is being brought out that warning of an insect outbreak is given by preceding weather conditions. The seasonal changes, as well as the changes in the atmosphere induced by the condition of the soil and crop, all alike contribute to the weather affecting insect activity. It has been noted, the stem borer *Schoenobius* is first attracted to growing paddy when the latter is 10—25 days old after planting (2) the incidence

* Bulletin of Entomological Research. Vol. xxv, pt. 1. March 1934.

is greater during wet weather (3) the percentage of damage is greatest in districts of heaviest rainfall (4) the earliest sown crop before the onset of the regular monsoon rains escapes infestation (5) the short duration varieties grown broadcast in dry lands without much standing water, show the least damage (6) the moths are active in still dark cool nights in largest numbers during periods of emergence, and that (7) a variety planted during successive fortnights of summer months has escaped infestation though the presence of moths at the time has been indicated by light trap catches. Besides, the casualities amongst newly hatching larvae, and the extent of parasitism on eggs, are comparatively low when cool weather and continous drizzling prevail during the period when eggs are laid. Under such conditions, heaviest damage to young seedlings is brought about. When the weather conditions and the stage of the crop favour a heavy incidence, an attempt to trap the moths has proved very useful to minimise infestation.

In the case of the army worm *Spodoptera* on paddy, the outbreak is more common in broadcast paddy sown in puddle in ill-drained soils. The sudden appearance of the moths in large numbers from distant sources, is a case of specific attraction by the prevailing atmospheric conditions of humidity, temperature and winds mainly, immediately after sowing and during the simultaneous formation of a tender green crop in a large scale, over an uncultivated area During the middle of April 1934, uniformly heavy down pour of rain for two or three days, after a prolonged drought flooded many of the low lying fields, all along the coastal tracts of Malabar. As sunny weather followed the water gradually dried up, and it is remarkable that during the moist warm weather, moths appeared and devastated a large share of the then broadcasted paddy crop, simultaneously in several places, all along the coastal tracts. During recent observations in the *Kole* areas in Malabar, it has been possible to note the first appearance of the moths during moist warm weather with cloudy and sultry nights and locate the possible centres of visitation. The daily weather changes obtaining in the locality with reference to temperature and humidity were recorded daily at minimum and maximum epochs using Lloyd's Hygrodeik from January 22nd to March 20th with notes on cloudiness of the sky, the nature of the winds and the number of rainy days, watching at the same time the appearance of the insect in the field and progress of the crop of successive sowings in 15—20 plots. The variation in temperature and humidity together with appearance and progress of infestation are plotted in graph attached. During the period 22—1—35 to 20—2—35, through which the sowing operations continued on successive days, providing stages of the crop of age ranging from 1-28 days, the moths and eggmasses could be observed in plenty, 5 times. It is seen that (1) there were successive arrivals of fresh moths in numbers 5 times during the sowing and early stages of paddy, (2) moths never selected a crop of

Records of weather, and incidence of the Army worm (Spodoptera) on Paddy—in the Kōle areas of Malabar 21—1—'35 to 22—3—'35.



over 20 days in age, (3) most active egglayings were observed on nights preceeding the mornings of temperature 78—82° F. and humidity 78—82% roughly, (4) life cycle was completed at a much quicker pace, and (5) when caterpillars were found later on, these could be traced to any one of the above batches, indicating that 'mothful' nights were particularly characterised by peculiar weather conditions with rise of humidity and temperature, gradual change in direction of winds and associated with cloudy sultry nights. In all these cases, the moths showed particular selective power to discriminate tender paddy aged 4—20 days, growing in miry wet ill-drained plots, leaving crop of the same age growing in dry and high level areas entirely free. By the end of February the days were getting hotter and drier, and the conditions changed, and no more fresh infestations were visible, though crops of suitable age were present in the locality till early in March. By more elaborate equipment to record all weather factors and also the micro-climate within the crop, in detail, it appears possible to gather more definite information on the above.

The latest reports of the appearance of the pest *Soorai* (*Ripersia oryzae*) on young paddy, in a damaging scale, probably for the first time in Malabar in such a severe form, all over a large tract, is possibly but another instance to show our gross ignorance of the ways of some pests in relation to weather, and the incapacity of the cultivator to take proper preventive measures in time. Recognising the above facts, in the case of many insect outbreaks, there is very little by way of direct control, especially in the case of borers, and mass out-breaks of sporadic insects, which remain active for a short interval. These are some of our examples to show the importance of the study of weather factors warning insect outbreaks, and their first appearance, and also of the study of the preventive measures, cannot be over-rated.

Important and Desirable Lines of Work in South India. In the opinion of the writers such data will be found very beneficial to determine the following important aspects of insect pests (1) the probable incidence of the outbreak and its distribution showing important pest centres, (2) the probability of the pests continuing in a particular locality in a virulent or mild form, (3) the necessity or otherwise of taking up feasible measures of minimising injury to the crop, in advance, and (4) the existence and the behaviour of parasites, if present, in the pest infested area.

The main idea in collecting meteorological and microclimatic data in connection with insect studies is to try to correlate, if possible, this data gathered for some periods with the vagaries and behaviour of some pests and then try to predict pest outbreaks and suggest prophylactic or other measures to check the ravages of the pest. It will be found that the results of such studies will be particularly helpful in the case of such insect pests which appear in plague form, cause terrible damage within short periods, and which are not generally

amenable to the ordinary rule of thumb measures like netting, bagging, spraying, etc. We have at least seven or eight such forms in South India and the best examples are the army worm, the red hairy caterpillar, the rice grasshopper, the paddy stem borer, the cholam earhead bug and the rice hispa. We will be well advised therefore if we start the investigation with special reference to these important insects. It is well known that some of these insects are considerably influenced by weather changes and many of our farmers are aware of the fact; but the real problems to be solved in this connection are what these relations actually are, and how a knowledge of such relations can be utilised in forecasting pest incidence and taking the necessary prophylactic measures when necessary. If we, succeed in getting at least some of these relations verified and are enabled to utilise these even to a small degree the farmer would be considerably helped in the control of some of his worst insect pests. These studies may not, of course, be so easy and bring immediate and tangible results, but from what we have seen of the results of such studies in Western countries especially in America, where such work has been done, it might be reasonable to expect that some encouraging results might be reached. Even if such studies are confined for the present, to South India, the results of these investigations might help to a great extent workers in other parts of India who have similar or same insect pests to contend against.

Suggestions for work. The work on Agricultural Meteorology so far done in India appears to be mainly confined to the study of various general aspects of weather changes and the principles that govern changes, etc., without any ideas of the application of this knowledge towards insect behaviour and pest control, at least at present. So it is felt that our studies in these lines with the idea of utilising the knowledge gained by weather studies to insect behaviour might open up valuable avenues to the Economic Entomologist for help in pest control.

The writers feel that the plan of the work in these studies might follow, the following chronological sequences: (a) select three or four of the major insect pests to be taken up for investigation in the first place. These might be (i) the paddy stem borer, (ii) the army worm of paddy, (iii) the paddy grasshopper, and (iv) the Red hairy caterpillar. (b) Record meteorological observations in selected localities where the pests occur regularly or sporadically in a mild or serious form. The observations chiefly consist of recording the daily weather conditions, as well as the insect incidence all through the year for sufficiently long period-say, for five years. Duplicate observations made on the same pest in different localities and observations according to standard method on more than one pest will be found very essential and helpful in the comparison of data with reference to the insect, time and place.

The different kinds of observations to be made consist of careful and accurate records of weather factors in 'the crop' and in 'the open' taken daily at maximum and minimum epoch periods. These include (i) air temperature, (ii) air humidity, (iii) precipitation. (iv) evaporative power of air, (v) soil temperature, (vi) air movements and (vii) soil moisture. The records of each fortnight may be summarised and maintained as unit for each season and locality. Regarding each insect pest under observation, the habits and intensity of population will have to be recorded noting at the same time the activity and influence of their parasites, if any, at the commencement and decline of the outbreak. In addition to the routine observations, Meteorological and Entomological, some fundamental research may have to be carried on at a central locality for confirmatory tests of field observations on the above insects in and out of season by rearing under controlled conditions. The methods for representing insect population during the different parts of the year at different stages of growth in a suitable form for comparison can be devised in the course of the work independently for each insect according to the nature and needs of insect concerned.

Much useful information can be gathered by work on the above lines and it is highly desirable that Agricultural Departments all over India start such work in the different provinces.

Conclusion. Though it may not be possible to control weather in a manner suitable to the needs of the farmer, the study of weather and its diverse effects on insect life in nature, is of the utmost importance to get a clear insight into the aetiology of insect outbreaks and to use all means of pest control and the proper time and to the maximum advantage. It may not be remote possibility even if some improvements in cultural practices are brought in, in the light of above knowledge, to check the multiplication of insects without impairing the progress of the crop. We may not perhaps be lucky in securing immediate results of a very substantial nature but there is no doubt that investigations on these suggested lines will certainly help us considerably in devising pest control methods.

Discussion.

The President remarked that the paper opened up a valuable avenue of research. He said that primary attention to the fundamental study of the normal life-history of the insect, later with the studies of its bionomics and lastly with its relation to meteorology, would make the problem easier of solution, than if a study of relationship between insect attack and weather is attempted straight away. Citing the instances of large swams of dragon fly in Ponnani and North Malabar, during certain seasons of the year and the outbreak of the *Nephantis* in South Canara in a mass form, he observed that, despite the control measures taken and the success attending them, we have to admit that our knowledge of partial migration in dragon flies and the normal life history of the *Nephantis*, was fundamentally not sufficient. In his opinion, this was just the subject, wherein the field worker with his observations on field could help with considerable advantage the specialist at the laboratory.

RADIO AND AGRICULTURAL PROPAGANDA

BY T. V. RANGASWAMI

Radio has revolutionized the whole world during the past decade and its importance lies in its immense use for imparting knowledge from a central broadcasting station, simultaneously to millions of people living far apart.

Radio is used in foreign countries for recreation and music, Schools, Police, Business, Municipalities, Agriculture, Trains, hospitals and prisons etc.

Nothing need be said about radio for recreation as it has become a necessary furniture in every household in foreign countries. School radio was a recent introduction for supplementing education taught by the average teacher in the schools. Radio for the use of Police has become almost indispensable in detecting criminals and evil-doers. For businessmen, broadcasting is in many countries a means of effective advertisement. For the press it is readily a source of news and for the seaman it is really a weather prophet. Broadcasting has already become indelibly interwoven into every branch of industry.

Radio in foreign countries, is becoming a useful method of agricultural propaganda. The United States Department of Agriculture has started Radio service for broadcasting agricultural news in the year 1932. Some of the details of the methods of working and the results achieved are given below.

Programmes are arranged by county extension services and broadcasting is undertaken by federal and states agencies, 15 minutes per day, 6 days a week being apportioned for Agricultural news. The details of programmes are modified to suit varying conditions in the state. Information is supplied by local county extension agents so as to give maximum local interest and adaptability. Wherever possible the local county agents to serve as authoritative speakers are allowed to present the programmes. The results are very encouraging from the reports given by the cultivator-listeners. The cultivators while insisting on the continuance of the Radio service, requested the authorities to use proper discretion on the choice of material and more on the way of presenting the information. They are jealous of their radio time and resent the inclusion of uninteresting news which distract their attention. They want the experience-reports of neighbouring farmers. Some of the preferences shown in the method of presenting are, that the programme must be in the form of simple questions and answers, in a form that is easy to listen and follow and in a form which requires the listener's participation with pencil and paper. By this method of Radio service, the propaganda department has been able to quicken the progress of work.

The Spanish Government, in order to increase the number of listeners have introduced broadcasting into the county homes. The Government have also decided, that all future agricultural exhibitions must reserve stands for the broadcasting. They declare, not without reason, that a receiving set is an indispensable part of a well-equipped farm, since Radio practically eliminates the isolation of the people living in the country. In Australia, an enterprising businessman wishing to canvas in widely spread rural districts, innovated a travelling broadcasting station. The transmitter is stored in 2 motor cars, one car being the transmitter proper and the other being the studio. An oil motor drives the generator which supplies the necessary electric energy. Two folding aerials, 12 metre high carry the 40-metre-long aerial. The aerial is mounted in every stopping place and a complete radio programme is emitted by means of approximately 400 gramophone records which are a part of the travelling broadcasting outfit. Furthermore propaganda is also made to advertise agricultural tools.

Agriculture propaganda in the Madras Presidency and how radio can be used to hasten the work: The present policy of the Madras Agricultural Department is to do propaganda by dissemination of such tested improved methods of agriculture as warrant their applicability to local conditions. There are several barriers in the way of quick progress and ryots taking up to improved agriculture. There are two potent factors mainly connected with the progress of improvement, the adviser and the advised.

The farmers in India live in rural areas removed far away from civilized centres, and with limited amenities for education and learning. The level of the general knowledge of the farmer being very low, it has been a difficult task to infuse into his unroused brain even fundamental improvements of extreme importance. The plea of want of finance cannot be taken as a tangible excuse, as even the most resourceful ryots do not respond to the substantial results shown in their own fields. Illiteracy and lack of means for the spread of knowledge have been against the penetration of new notions and ambitions in the life of the farmer. Traditional customs are also deep rooted obstructions standing in the way of the easy solution of the problem of propaganda.

The condition of the demonstrator is worthy of consideration. With the finance available, the Government have fitted each taluk with a demonstrator, for propaganda purposes. His work is of a multifarious nature, his staff is limited, his jurisdiction is wide and problems to be tackled by him are many. The present system of propaganda has behind it, the idea of central village system, to cater to the needs of a selected few central villages, out of 200 or 250 villages in the taluk. The department has adopted the best possible method. Since it is the quality of the work that leaves a potent result in the mind of the

farmer towards the decision of any improvement, work of an intensive nature should be preferred to that of an extensive nature. Under this system a long time will have to elapse before improvements are taken up, on a mass scale. Some of the practical difficulties that arise may be summarised as follows:

(1) The demonstrator cannot meet all the ryots of a village at the time of his visit.

(2) As the demonstrator is a constantly touring man he cannot be available to the ryots when they want him.

(3) Financing of experiments being an important factor, the demonstrator has naturally and necessarily got to concentrate his work in the fields of a few generous amicable and resourceful farmers, such that he can show a turn out of work to his Superior Officers.

(4) The demonstrator has other responsible duties as attending to sale of implements and seeds, trial-plots, demonstration-plots and seed farms and he is at the same time expected to introduce one or all the branches of improvements in each central village.

In spite of all these handicaps, the demonstrator receives a ready compliance from the ryots to carry out improvements, but the results are not commensurate with his efforts.

Summing up, we see that the lack of spread of knowledge amongst the cultivators and the various handicaps a demonstrator has, stand in the way and impede the quick progress. What is wanted is acceleration of progress to vie with the rest of the world.

The radio service for agricultural propaganda is cited to produce the acceleration aimed at. As no trial has been given in Madras and as no result of experiments carried out in other parts of India with the same goal in view is yet to hand, we have to imagine a situation when radio is introduced in the rural areas. So, let us imagine that a receiver is introduced in a particular village. The audience gather round the village stadium every evening after the toils of the day are over. An etherial voice in the local tongue is heard giving out

1. Information on market reports, which are important to ryots as they are keen on getting the full worth of their produce and particular about paying the least for their requirements, 2. Information on the general weather conditions that helps them to forecast their programmes for the future, 3. Information on what other farmers are doing in their neighbouring tracts and how improvements in cultivation are effected with specific details, 4. Information as to where seeds are to be obtained; their prices and available quantities, 5. Importance of seed selection, preservation and treatments before sowing to prevent seed borne diseases, 6. Information on the importance of removal of weeds and the various implements used for clean cultivation, 7. Tips on the preservation and application of manures and

the quantities to be used as per requirements of crops, 8. The regularity of supply of water in channels, the height of water, and the duration of assured supply, the improvements on water lifts and mhote wheels, 9. Information of the economical methods of harvest, curing of the produce, conversion of raw into finished products as in the case of cream jaggery preparation and the preservation of the produce for the market, 10. Information on the preventive and control measures of pests and diseases, 11. Information on the safe guarding of cattle against epidemics and such other information as is of use to the ryots.

Thus information and suggestions for improvements are Broadcasted together.

What would be the effect of such an introduction? At first it will attract all the audience as the cinema has done in towns and cities. Will the audience come to the receiver daily and will the farmers carry out the improvements given to them? All this depends upon the material and the way in which it is presented. In short, to make radio popular in villages, the following will serve to be followed.

Necessary relevant information of use to the ryot in a concise and definite manner, (to produce a solid illusion in the mind of the farmer) is to be given out in a way easy to listen, understand and remember. The information should be gathered and supplied by local authorities in order to give local interest and then presented before the microphone of the Broadcasting station to produce authoritative influence. Occasionally popular ryots could be made to report their personal experiences on the effect of these improvements on their own lands. The repeated dinning of useful information at such opportune moments, into the ears of the farmer is bound to achieve the object of the Radio service. Should the information make the ryots believe the receiver, and make them realise its use, success of Radio service is guaranteed.

In this connection it may be mentioned that

1. The radio service is not meant to replace the demonstrator,

2. The radio service is to be used for extensive propaganda to augment the intensive work of the demonstrator and to tune up the mind of the farmer in rendering the advice of the Agricultural demonstrator more effective,

3. The radio service can also be used for many other propaganda in rural uplift, as health, industries, cooperation and economics.

Radio in India compared to the world. The number of transmitters in the following countries are:— United States of America 585, U. S. S. R. 75, Canada 67, Australia 61, Germany 26, Japan 26, Great Britain 14 and India 2. India thus occupies the lowest position, in having for 353 millions of population spread over 5 million square

kilometres a total antenna power of only 6 kilowatts which works up to ·0013 watts per square kilometre, and ·05 the number of receiver per thousand of population. Denmark leads in this respect having 160 per 1000 of population.

Radio was introduced in India in 1927 by private commercial monopoly, but later on taken up by Government. Proposal for the starting of a 20 kilowatt station in Delhi has been approved and work has been started while the increasing of the power of Madras from 2·5 to 20 kilowatts is under contemplation. After the completion of the work, broadcasting in Madras will be considerably improved. Madras which is now not logged ordinarily beyond 50 miles then can be heard 600 to 700 miles off, quite easily, on loud speaker strength.

The following is a suggestion for a small rural radio scheme to be tried in Madras. Install radio receivers in central villages of the districts round about Madras. The Radio receivers should be battery operated, and built of long standing components, using super sensitive circuits of the heterodyne principle, with self adjusting volume control and permanently tuned to the one broadcasting centre and worked by automatic clockwork switches which set the receiver working at a particular hour and stop it after constant interval during which time programmes will be broadcasted. Field reporters in charge of 20 to 30 such sets may attend to the replenishing of batteries, charging of batteries, and any flaw in the receiver will be reported to the Radio Engineer who attends to the satisfactory reception. The working method of the Radio service has been already given.

The financing of the Scheme is beyond the domain of this paper. It may however be pointed out that when the cost of receivers ranges from 100 to 1000s of rupees, the type of receiver suggested will cost not less than Rs. 300 and the annual working expenses Rs. 70 to 80 for 3 working hours per day including license fees and replacements. The cost of the receivers is rather high owing to the fact, that India is not a manufacturing country and there is a heavy import duty of 50 per cent on wireless goods. Radio research is wanting in India to build receivers suited to local conditions to overcome atmospheric disturbances. By increasing the power of existing stations and providing more stations, reception can be improved very much. The finance of the installation of sets in villages may be met partly by different departments of Government connected with rural uplift and partly from funds of Panchayat Boards. If such a scheme is workable and results in success the scheme may be extended in slow degrees by starting more transmitting centres to suit local conditions, paying more attention to linguistic variations.

Discussion.

Mr. K. Raghavachari said that in addition to the Departmental exhibition vans existing now, which were becoming stale a radio set also might be purchased and tried.

Mr. T. Paramanandem was doubtful about the necessity for investing money in a costly radio equipment, as in his opinion, the village tom tom was good enough for propaganda.

Rao Bahadur G. N. Rangaswamy Ayyangar relating an experience of his in a village, where he saw a motor car with a loudspeaker advertising cafiaspirin, felt it was a very good idea of combining business and service.

The President said that whatever people might say, the radio was bound to come and if we are to be practical men, we must harness the radio idea for propaganda, otherwise other nations will leave us far behind.

Crop & Trade Reports.

Groundnut—2nd Report— Summer crop—Areas and yield. The area under the summer or irrigated crop of groundnut in parts of the Madras Presidency during the five months of January to May 1935 is estimated at 67,000 acres. When compared with the area of 77,400 acres estimated for the corresponding period of last year, it reveals a decrease of 13·4 per cent. The crop has been harvested in most places. The yield is reported to be below normal in all the districts except Nellore, Trichinopoly and Madura where it is reported to be normal. The total yield is estimated at 57,000 tons of unshelled nuts as against 66,700 tons during the corresponding period of last year.

Early crop—Area and yield. The area under the early crop of groundnut (mostly unirrigated up to the 25th July 1935 in the districts of Salem and Coimbatore is estimated at 96,000 acres. When compared with the area of 127,000 acres estimated for the corresponding period of last year, it reveals a decrease of 24 per cent. The decrease is due to late and insufficient rains. The condition of the crop is generally satisfactory. The total yield is estimated at 44,100 tons of unshelled nuts as against 61,100 tons estimated for the corresponding period of last year.

Price. The wholesale price of groundnut (shelled) per imperial maund of 82 2/7 lb. as reported from important markets towards the close of July 1935 was Rs 6—4—0 in Cuddalore, Rs. 5—10—0 in Vizagapatam, Rs. 5—8—0 in Vizianagaram, Rs 5—4—0 in Vellore, Rs. 5—2—0 in Guntur and Cuddapah, Rs. 5—1—0 in Salem, Rs. 4—15—0 in Nandyal and Rs. 4—10—0 in Adoni. When compared with the prices of June 1935, these prices reveal a fall of 12 per cent in Vizagapatam, 11 per cent in Salem, 10 per cent. in Vizianagaram, 7 per cent. in Vellore, and 1 per cent. in Nandyal. The prices remained stationary in the other centres.

Sugarcane—First Report. The average of the areas under sugarcane in the Madras Presidency during the five years ending 1933—1934 has represented 3·7 per cent of the total area under sugarcane in India.

The area under sugarcane up to the 25th July 1935 is estimated at 108,650 acres. When compared with the area of 104,080 acres estimated for the corresponding period of last year, it reveals an increase of 4·4 per cent. There has been an increase in area in the Circars (Guntur excepted), Cuddapah, Chingleput, South Arcot, Chittoor, North Arcot and the West Coast which has been partly counter-balanced by a decrease in area in Guntur, the Deccan (Cuddapah excepted), Salem, Trichinopoly, Madura and Ramnad. The increase in area in Kistna is attributed to the opening of a sugar factory at Vuyyur.

The condition of the crop is generally satisfactory.

The wholesale price of jaggery per imperial maund of 82 2/7 lbs. as reported from important markets towards the close of July 1935 was Rs. 8—1—0 in Nandyal,

Rs. 6—9—0 in Bellary, Rs. 6—4—0 in Bezwada, Rs. 6/- in Ellore Rs. 5—15—0 in Guntur, Rs. 5--12—0 in Cuddapah, Rs. 5—10—0 in Cocanada, Rs. 5—9—0 in Rajahmundry, Rs. 5—4—0 in Vellore, Rs. 5--2—0 in Erode, Rs. 4—9—0 in Vizagapatam and Rs. 4—7—0 in Trichinopoly. When compared with the prices in the corresponding period of last year, these prices reveal a rise of 38 per cent in Bellary, 30 per cent in Ellore, 28 per cent in Nandyal, 25 per cent in Guntur, 16 per cent in Cuddapah, and 6 per cent in Vellore and a fall of 15 per cent in Erode and 5 per cent in Trichinopoly.

Gingelly. First Report. The average of the areas under gingelly in the Madras Presidency during the five years ending 1933—34 has represented 12 per cent of the total area under gingelly in India.

2. **Area.** The area under gingelly up to the 25th July 1935 is estimated at 307,900 acres. When compared with the area of 310,600 acres estimated for the corresponding period of last year, it reveals a decrease of 2,700 acres i. e., about 0·9 per cent. The decrease in area occurs in East Godavari, South Arcot, North Arcot, Salem, Tanjore and Madura and is due to want of timely sowing rains.

3. **Yield.** The yield is expected to be generally below normal except in the Circars (Ganjam and Vizagapatam excepted), the Deccan and Coimbatore owing to the insufficiency of summer showers. In parts of the Circars and in the Deccan the crop is still very young and its condition is satisfactory.

Receipt of loose cotton at presses and mills in Bales of 400 lbs.

	1st February 35 to 19th July 35	1—2—35 to 26—7—35	1—2—35 to 2—8—35
Receipts during the year	322,160	334,131	343,816
Corresponding period in previous year	385 566	405,531	421,820
Pressed Cotton.			
Receipts in spinning mills	192,067	197,884	203,340
Export by sea.	81,692	86,492	89,392
Imports by sea.	37,169	37.708	37.708

College News and Notes.

Literary. The literary activities of the student's club were inaugurated on the 31st of July by an interesting address by Mr. T. V. Srinivasaraghavachari, B. A., Retired Principal, Police Recruit School, Mr. R. C. Broadfoot, Principal presiding. Speaking on the importance of Agricultural education in India, the speaker attributed the revolutionary changes in Indian agriculture to two pre-eminent factors namely the growth of free communications and the advancement of science. After a learned survey of the world conditions, he concluded with a fervent appeal to the students to do the needful and bridge the gulf between urban and rural populations that existed today as a result of the westernisation of the former and the grinding poverty of the latter. The meeting was brought to a close with a few concluding remarks from the chair and the vote of thanks by the Secretary.

Andhra Students' Union. On the 1st August the inaugural address of the Agricultural College Andhra Students' Union was delivered by M. R. Ry. Goteti Jogiraju Pantulu Garu, Mr. K. Krishnamurthi Rao, President of the Union, presiding. Speaking on "Krushi" or work, he traced the difference between the various types of work and concluded by emphasising the need on the part of the students to live for an ideal and to struggle and work for it irrespective of the consequences.

Sports. Tennis. On the 8th August a match was played between our college and the Local Government College on our courts. Messrs. Moncy Joseph and Herbert Adiseshiah playing for our College scored an easy victory in two straight sets (6—3; 6—1).

Foot Ball. Two matches were played during the period under review, the first on the 22nd July being against Municipal High School which ended in a victory for the visitors by 2 goals to nil. The second match was played on the 5th August against the Government College and resulted in a victory for the home team by 3 goals to 2.

Hockey. On the 15th August a hockey match was played against N. M. S. XI in which the College beat the visitors by 5 goals to nil. Messrs B. K. Mohan Rao, Rajagopalan and Ramachandran shared the honours of the day, claiming three, one and one goal respectively.

Cricket. The cricket XI was by far the busiest and played no less than four, matches within the brief period of three weeks. On 21st July, the College, defeated Southern Provinces Mounted Rifles XI. by 50 runs and 7 wickets Messrs Albuquerque and Ramanatha Rao contributing 40 and 54 (not out) respectively. On the 27th, the College registered another easy victory over Govern. ment College. On the 28th the College played against Coimbatore cricket club. Winning the toss the college scored 183 for 9 and declared. Mr. Narasinga Rao was the top scorer with 76 runs. The visitors collected 124 for 9, when stumps were drawn leaving the match a draw. Rajagopal and Narasinga Rao were the most successful bowlers claiming 5 wickets for 48 runs and 4 wickets for 41 runs respectively. On the 14th August the college played a half day match against the Forest College and won comfortably by 71 runs and 6 wickets. Mr. C. N. Babu contributed 50 for the College and Mr. Rajagopal took 7 for 44 including 3 wickets in 4 consecutive balls

Y. M. C. A. Cricket Tournament. The tournment has attracted four entries viz., the Forest College, Government College, Agricultural College and the Coimbatore Cricket Club. Our first match came off on the 22nd instant when we met the Coimbatore Cricket Club and defeated them by 118 runs.

College Day Cricket. Following the College day sports and the Conference a match was played on Sunday the 4th August between the pure College eleven and the rest of the Department. The rest were strengthened by the inclusion of Mr. C. Ramaswami, T. Murari and C. N. Babu. The rest batted first and made —for wickets, the chief scorers being Murari (50) Varadarajan (30) and Babu (17) C. Ramaswami disappointed the impatient crowd when he pulled a short ball with a hefty stroke but was brilliantly caught by Kunhiraman Menon near the boundary line. The college team replied with 98 runs for the fall of 2 wickets. The match ended in a draw.

The Association of Upper Subordinates. The annual general body meeting of the Association was held on the 4th August. The function began with tea at which the resident members and those who had assembled at Coimbatore to attend the Conference, took part. The annual report of the Association was presented and adopted. The Office-bearers were elected for the year 1935—36.

President: Mr. S. N. Chandrasekhara Ayyar.
Secretary: Mr. C. S. Krishnaswami.
Other members of the Committee: Mr. E. K. Nambiyar. Mr. S. V. Doraiswami. Mr. V. T. Subbiah Mudaliyar.

Officers' Club. Construction work in connection with the extension of the Officers' Club buildings has begun and it is hoped that the work will be completed by December 1935.

Weather Review (JULY 1935).

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	16·7	+9·8	22 8	South	Negapatam	1·2	-0·6	14·6
	Berhampore *	12·1	+3·6	23·3		Aduthurai *	0·2	-1·0	8 6
	Calingapatam	3·9	-2·0	15 5		Madura	0·7	-1·2	6·4
	Vizagapatam	2·5	-1·9	6·4		Pamban	0·0	-0·6	10·5
	Anakapalli *	4·4	-1 3	6·6		Koilpatti *	0 0	-0·7	8·3
	Samalkota	6 3	-1·1	12·0					
	Maruteru *	3·8	-5 6	5 4					
	Cocanada	7·5	+1 7	9·6	West	Trivandrum	6·9	-0·7	23 5
	Masulipatam	8·4	+2·0	12·1	Coast	Cochin	15 6	-9·2	44 3
	Guntur *	4·2	-0·8	12·7		Calicut	41·6	+11·4	68 7
						Pattambi *	26·8	+2·7	41·8
Ceded Dists.	Kurnool	6·8	+1 9	12·7		Taliparamba *	51 9	+5·2	86·8
	Nandyal *	6 5	+1·0	11·2		Kasargode *	46·1	+9·6	100 1
	Hagari *	4·2	+2·2	11 0		Nileshwar *	44 2	+4·6	84·9
	Bellary	2·5	+0·6	7 5		Mangalore	42 1	+5·0	75·4
	Anantapur	0·7	...	5 7					
	Cuddapah	7·1	+3·1	13·9					
					Mysore	Chitaldrug	1·8	-1·2	11·5
Carnatic	Nellore	5·6	+2·9	7·5	and	Bangalore	3 2	-0·9	13 5
	Madras	2·2	-1·7	4·0	Coorg	Mysore	2·5	nil	16·1
	Palur *	a	a	a		Mercara	49·6	+8·7	70·7
	Palakuppam *	1 2	-0 4	4·0					
	Cuddalore	2·2	-0·8	6·7					
					Hills.	Kodaikanal	4 6	-0 4	26·8
Central	Vellore	2·1	-3·1	6 4		Coonoor	2 5	...	21·4
	Hosur cattle farm *	a	a	a		Ootacamund *	5·1	-0·2	15 8
						Nanjanad *	6 6	-5 1	23·7
	Salem	4·6	+0·8	11·5					
	Coimbatore	0 6	-0·9	4·4					
	Coimbatore Res. Inst. *	0·6	-0 7	5·1					
	Trichinopoly	0 0	-1 5	11·7					

a Reports not received.

* Meteorological Stations of the Madras Agricultural Department.

Strong monsoon conditions prevailed on the West coast of the Peninsula throughout the month. Three depressions appeared in the North West angle of the Bay of Bengal and caused a strong monsoon in Orissa, North Madras coast and the central parts of the country. The first of these appeared on the 7th in the Northwest angle of the Bay and crossed the coast on the 9th causing widespread rain on the Orissa—Ganjam coast. Moving North-west wards it got filled up by the 13th. Unsettled conditions off the Circars coast were observed on the

14th and developing into a shallow depression, it moved on to the North west corner of the Bay causing a strong monsoon in Orissa and the region lying between Chota Nagpur and Kathiawar. The depression remaining practically stationary merged into the seasonal trough of low pressure on the 21st. Moving inwards on the 22nd, it strengthened the monsoon in the Central parts of the country. Conditions became unsettled once again on the 28th, in the North West angle of the Bay, when a low pressure area was formed, causing vigorous monsoon in the central parts of the country.

Rainfall was in moderate excess on the West coast, and in the Ceded districts and locally in the Circars and in defect in South Madras.

Chief falls reported were :

Taliparamba	4·6″
Berhampore	4·9″
Calicut	5·7″ on the 8th.
Masulipatam	4 5″ on the 14th.
Kuttikanan (Travancore) ...	5 5″ on the 10th.
Gopalpur	6 0″ on the 18th.
Mercara	4·4″ on the 29th.
Pattambi	5·8″

Maximum temperatures remained either normal or below normal.

Weather Report for the Research Institute Observatory.

Report No. 7/35.

Absolute Maximum in shade	...	94·0°F.
Absolute Minimum in shade	...	67 2°F.
Mean maximum in shade	...	88 0°F.
Departure from normal	...	+ 0·9°F.
Mean minimum in shade	...	72·9°F.
Departure from normal	...	+ 0 9°F.
Total rainfall	...	0·57″
Departure from normal	...	− 0·70″
Heaviest fall in 24 hours	...	0·24″
Total number of rainy days	...	2
Mean daily wind velocity	...	8·1 m. p. h.
Mean humidity at 8 hours	...	65 5%
Departure from normal		− 5·9

General Summary. Maximum and minimum temperatures were slightly above normal. Due to the strong monsoon in the West Coast, there were high winds but not much rain, which however was defective.

A. S. R. & A. S.

Departmental Notifications.

Gazette Notifications. Mr. M. C. Cherian to officiate as Entomologist. Mr. P. N Krishna Iyer to officiate as Lecturer in Entomology. Mr. S. Ramachandran to officiate as Assistant Entomologist. Mr. C. R Srinivasa Iyengar to be Superintendent, A. R. S., Pattambi. Mr C. Ramaswami Naidu to officiate as Deputy Director of Agriculture, VI Circle, Madura.

New Appointment. Mr. P. Israel, as Assistant in the Entomology section (Madras Agricul ural Subordinate Service Class I. III grade Rs 75—7½/2—105).

Transfers. Mr. S. Dharmalingam Mudaliar officiating Supdt., Pattambi, to be Assistant, Paddy section, Coimbatore on reversion. Mr. B. Suryanarayana Rao officiating Assistant, Entomology section to officiate as Assistant Lecturer in Entomology in the Agricultural College. Mr. A. K. Ganesa Iyer A. D. Ramnad

to Tirumangalam sub-circle. Mr. C. A. S. Ramalingam Pillai, from Manamadura to Ramnad. Mr. Edwin Amirtharaju from Madura to Ramnad. Mr. A. Ramados, Cotton Assistant, Guntur to Coimbatore. Mr. P. N. Krishnaswami Rao, Cotton Section, Coimbatore to Guntur.

Leave. Mr. K. Sitarama Iyer, A. D. Perambalur, extension of l. a. p. for two months. Mr. V. K. Kunhunni Nambiar, F. M. Kasargode, extension of l. a. p. on M. C. for 3 months. Mr. K. Veerabhadra Rao, Assistant in Chemistry, Anakapalle, l. a. p. on M. C. for 2 months from 4th July. Mr. S. Varadarajulu Naidu, A. D. Royadrug l. a. p. on M. C. for 4 months from 18th June in continuation of leave already granted. Mr. G. Sitarama Sastri extension of leave on half average pay for 2 months. Mr. P. S. H. Narayanaswami Naidu, F. M. Anakapalle A. R. S., l. a. p. for 2 months from 1—8—35. Mr. C. A. S. Ramalingam Pillai, A. A. D. Manamadura extension of l. a. p. for two months. Mr. M. A. Balakrishna Iyer l. a. p. for two months from 12—8—35.