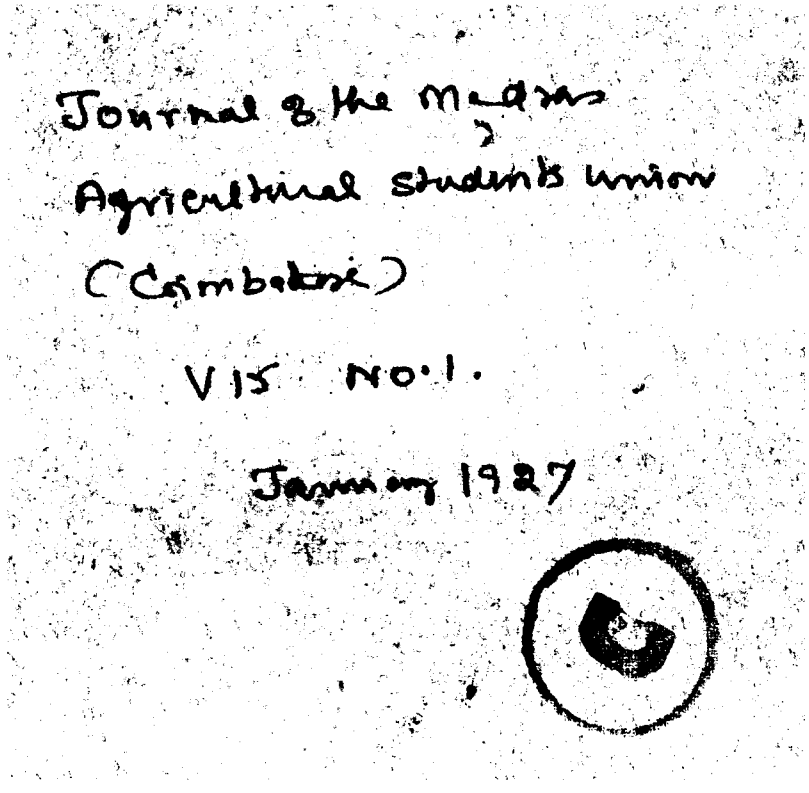

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The Ramasastrulu-Munagala Prize 1927.

1. The Prize will be awarded in July this year.

2. The Prize will be in the form of a Medal and will be awarded to the member of the Union who submits the best account, of original research or enquiry, carried out by him on any agricultural subject.

3. The subject-matter shall not exceed in length twelve foolscap pages type-written on one side.

4. Intending competitors should notify the Secretary of the Madras Agricultural Students' Union not later than the 1st June the subject of the paper which they propose to submit and the paper should be sent in so as to reach the Secretary, Madras Agricultural Students, Union not later than the 15th June 1927, with a covering letter showing full name and address of the sender. The author's name should not be shown on the paper which should be entered under a *nom-de-plume*.

5. Four type written copies of the essays should be sent in.

6. The name of the successful competitor will be announced and the prize awarded at the time of the Conference.

7. The Union reserves to itself the right of publishing all or any of the papers.

8. All references in the paper to published books, reports or papers by other workers must be acknowledged.

9. Papers submitted will become the property of the Union.

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

Secretary,

M. A. S. Union.

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

THE JOURNAL
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CROP STUDY.*

G. N. Rangaswami Ayyangar, B. A.,
Millets Specialist.

From ancient times man in quest of satisfying his unappeasable sense of curiosity has looked out wide into the world. The vegetable kingdom with its variety of colour and form offered a most agreeable study. A pursuit of the *why and wherefore* of such diversity led to the systematic study of plants. You are all familiar with the obvious differences between a tamarind and a coconut, between a bamboo and a fern. The systematic Botanist differentiated between varieties of each plant group. Where the Systematic Botanist ends, the Crop Botanist begins.

Crops on account of their familiarity were, until recent times, the victims of the proverbial contempt. Of late, agricultural development has tended to get beyond the usual orthodox channels and with the growth of populations and the stress on cultivable land necessitated by an imperative increase in the food supply, it led to the study of crops as individuals instead of the usual neglect as populations. I consider this intense study, as a sign of the times symptomatic of that analytical tendency which must go down to an unit basis.

* Paper read at the M. A. S. U. Jubilee Conference in July 1926.

The specialization in crops has become the order of the day and with the growth of interest in agriculture more crops are getting to be known intensively about. The monograms on Wheat by Percival, Cotton by Balls, Rice by Copeland, Oats by Etheridge, and Maize by Weatherwax, are examples of that tendency. In our own country cotton has been studied longest. Wheat, sugarcane and groundnut followed suit. Rice was taken up a decade ago and the interest in millets has coincided curiously enough with the coming into political prominence of that desire to do justice—and equally, justice to the food crops of the poor.

My colleague in Paddy will in a subsequent paper tell you what plant breeding has done and can do to improve our own crops, and I propose in this paper to give you an idea illustrated by cholam examples of what it is to study a crop before you can feel yourself in a position to be able to say that you can improve it.

All of you are familiar with the cholam plant. It is an annual viz., sown and harvested within the period of a year. There are short and long duration varieties and the study of duration is virtually a study of the plant projected through time. We often meet with a problem that a particular variety needs profitably be shortened in its duration by a fortnight and in such instances knowledge about the heredity of duration is of immense help. *Duration* is a character complex and its pursuit in heredity is a problem of immense difficulty. I have recently had an instance in which a very long duration variety pulled up almost to its length of existence a comparatively earlier variety, thus offering indications of a complexity which a blend would not have afforded. Next to *height*. Height is the accumulation of internodal lengths. Their number and relative lengths have to be studied. How far height is a help or hindrance depends upon the locality in which the plant is grown. In a wind-swept place a dwarfish plant, is an asset. In virgin soil where rank growth could be made a tall plant like the Thalaivirichan Cholam, is not uneconomic. Internodes are between nodes and at each node is a leaf. It has a leaf sheath. The sheaths are of three colours, black, light red or brown. The relative lengths of internodes which are sheathed up serve as one of the varietal characters. In a short stubby plant like the Tella Jonna of Bellary there is hardly a bit of stem visible—it is all

sheath. But in the graceful Irungu there is plenty of golden internode prominent. The number of leaves and their area present problems so intimately associated with drought resistance that they form a line of study apart, of a major magnitude and leaf is so intimately associated with plant food that any unthinking diminution may react on yield. The problem is one of great complexity and the happy mean struck in reducing the leaf-surface to that safe degree which would not impair the requisite chlorophyll function, would mark the success of the work of breeding for drought resistance.

In the leaf itself there are two midrib colours the white and the dull. The white is associated with a pithy stalk and the dull with a sweet stalk which has an enhanced fodder value.

Going upwards, we come to the flag which is the terminal leaf of the plant. Its sheath is either wound round the stem clockwise or anticlockwise. The leaves below alternate with the flag sheath in the manner of their winding.

Proceeding to the head we find varying degrees of emergence. Some appear stuck up as it were in the leaf zone. In others the head is carried aloft and others in their richness seem to bend down with commendable humility. The stalk of the head presents either a smooth surface which often goes with an elongated stalk or shows a wartiness associated with a short stalk.

Of the head proper there are various shapes. The central stalk of the head and the relative lengths of the panicle branches, and the inter-relationships between the two, differentiate the shape of the head. There is a whole range from a head almost like a cricket ball to one so streaming as to give it a name indicative of that appearence which characterises a woman with her hair let loose.

Coming to grain colour you are all familiar with the three broad groups yellow, white and red. There are various intensities of these and of a definiteness which herditary studies have revealed. Such colours are light, yellow and light red. That end of the Cholam grain which is clipped up inside the glumes gives a clue to the nature of the grain, a wash of red indicating the latent red nature of the grain, only wanting an activator to bring out the

night, through rain and sunshine, and on every occasion they have had new personal revelations in store, a special tint of green, a particular droop, or some such elusive characteristic, which must have been among the experiences of those claiming intimate acquaintance with the crop.

All these lines of study I have indicated mean patient application. We are your servants and are deliberately out to serve. Please ensure us the necessary ease of mind and the requisite time. Have an eye and make certain whether the right man is at the helm and whether the hand is steady and the gaze true—and, for the rest, the results are in the hands of the Gods, and as for the worker, work--good work—is its own reward.

N. B.—The paper was illustrated by special paintings and live specimens.

EXPLANATION OF SOME TEMS USED.

Jonna or Cholan	...	Sorghum Vulgare.
Ragi	...	Eleusine Coracana.
Tenai	...	Setaria italica.
Samai	...	Panicum miliare.
Panivaragu	...	Panicum miliaceum.
Cumbu	...	Pennisetum typhoideum.

THE RISE AND PROGRESS OF ENTOMOLOGY IN INDIA *

T. V. RAMAKRISHNA AYYAR B. A.,
Madras Agricultural Department.

The science of Entomology has all along fared as the "Cinderella" among natural sciences, and as such compared with the advances made by sister sciences like Botany, Chemistry etc., the progress made by this young science has been inevitably slow and comparatively little. This has been particularly so in India for one or two important reasons as far as the writer could judge. One of these may be the fact that most Indians generally possess a natural and more or less instinctive aversion for lower forms of life and usually exhibit a considerable degree of sentimental repulsion when they have to handle them or come into contact with them. Another fact which might have helped to retard the progress was probably that the value of nature study in Elementary schools was not realised in India till very lately, and subjects like Botany and Zoology were practically the latest to receive some recognition at the hands of Government and Educational institutions. The absence of any substantial early literature on the subject in India does not however warrant us to conclude that people in ancient India had no knowledge of insects and lower forms of life. It has been shown by oriental scholars that even in ancient times some Sanskrit authors had some knowledge of animals, and the elements of animal classification, as for example authors like the Physician 'Susrutha', 'Umasvati' (a) and others. There are also frequent references in Vedic and other Hindu religious and literary works to different kinds of insects and the occurrence of such words as 'Pathanga', 'Bhramara', 'Pipilika', 'Makshika' etc. are evidences to show that our ancestors were not unfamiliar with insect forms; and it will be very interesting to know that 'Susrutha' has even gone to the extent of classifying 'Pipilikas' (Ants) into six divisions (b) and some of the names of these subdivisions show considerable powers of observation on the part of the author of the structure and habits of these little creatures.

(a) (See Dr. B. Seal's Positive Sciences of Ancient Hindus).

(b) Classfication of Pipilikas (Ants) by Susrutha.

(1) Sthula Siras. (2) Sam Vahika. (3) Angulika, (4) Brahmanika. (5) Kapilika. (6) Chitravarna. (The name *Amba Kapilaka* was applied to the White ant queen). (See Mem. Asi. Soc. Bengal I. 1905—p 368).

* Paper read at the M. A. S. U. Jubilee Confernce in July 1926.

There is also sufficient evidence to prove that people in many parts of India had a good knowledge of the lac insect "*Laksha*" and that lac was cultivated and made use of in those days; and there also appear stray references in early Greek writers to the Indian lac insect. The story in the Mahabaratha of the "House of lac" constructed to destroy the Pandavas is well known to most of us. The use of the lac dye (*Laksha rasa*) was also prevalent in those days as may be seen from references to this substance in ancient works including Kalidasa's "Sakuntala." From time immemorial familiarity with the bees and the gathering of honey and wax from the honey bee (*Madhu makshika*) have been known all over India. Apart from the above facts and the few references to insects in works of ancient physicians and surgeons we do not possess any records of work done on modern lines on insects in ancient India. Reference may, however, be made to "*Mandavya*" the boy sage in the Mahabharatha (a) who had the habit of collecting and pinning insects and who had to pay a heavy penalty for this act by being himself impaled on the point of a sharp crow-bar for a pretty long time. That appears to be a bit of the biography of the first Indian insect collector?

So much for what little we know of Entomology in ancient India. For existing records of reliable scientific work on Indian insects on modern lines, however, we need not extend our researches further back beyond the middle of the 18th century. And it is a matter for congratulation to note that regular work on Indian insects on modern lines was first initiated in S. India, the pioneer in this line being Dr. K. G. Koenig, a pupil of the great naturalist Linnæus. Dr. Kœnig was at first attached as a medical officer in the Tranquebar Mission, and was for some time the Naturalist to the then Nawab of Arcot,—One wonders whether any of the modern Nawabs or Zamindars employs a naturalist—Dr. Kœnig was a very good botanist as well and made a valuable collection of both plants and insects from the Coromandal tracts and made a special study of white ants. His paper on white ants which he specially studied in detail in a few places near Tanjore was published in 1779* in a German periodical and this exceedingly interesting account may be said to be the first really scientific production of modern days on Indian Entomology. From

(a) Probably in the Aranya parva.

* See Fletcher's translation fourth Ent, Rept.

this time onwards work on Indian insects began to be done by many others, especially due to the well known scientific enthusiasm and energy of many of the officers employed by the early missions and the East India Company. In 1781 Dr. Kerr published an account of the "Lac" insect. And it was by about that decade that the Asiatic Society of Bengal was started in Calcutta under the distinguished patronage and leadership of the judge and oriental scholar Sir William Jones. This society has been in existence for over a century now, and it is needless to add that its periodicals started in 1788 contain a mine of information on various scientific subjects including Entomology, and it is under the auspices of this ancient society that the "Indian Science Congress" is now held every year. Dr. Roxburgh, the famous Botanist, contributed a detailed account of the lac insect to the "Asiatic Researches" in 1790. In 1791 Dr. J. Anderson, Physician-General to the East India Company at Madras wrote a monograph on his researches on "Cochineal" or scale insects (Coccidae). In 1800 the famous traveller Buchanan wrote not only on the cultivation of the lac insect in India but also added his valuable observation on silkworms and their cultivation in some parts of S. India. It was only in the beginning of the 19th century, however, that the first general work on insects of Asia appeared and this was E. Donovan's "Natural history of insects" a publication which was edited with good illustrations and accounts of the insects by the famous British Entomologist J. O. Westwood in 1842. During the closing years of the 18th and the early years of the 19th century we find the famous European Entomologist, Fabricius describing numerous S. Indian insects mostly collected by Koenig and others in his monumental publications. In 1840 a paper on the "Entomology of the Himalayas and India" appeared in the Madras journal of Literature and Science under the authorship of Rev. F. W. Hope. During the same period the classical works of Westwood known as the "Cabinet of oriental Entomology and Arcana Entomology" appeared and the former which came out in 1848 attracted a good deal of attention from European settlers in the East and created an enthusiasm and impetus in many of them to carry on Entomological work as was anticipated by the author in his introductory remarks which were "that by finding its way to the table of the Indian drawing room the book may gain additional converts to the study of a science full of curiosity and awaken an interest in the objects of pursuit, thus supplying an engaging occupation to our

Indian friends." By the latter part of the last century considerable facilities and encouragement were afforded to the study of scientific subjects by the starting of institutions like the Indian Museum in Calcutta and the Natural History Society in Bombay. Remarkable work has been done by the officers connected with the Indian Museum in the early days on insects, and the pages of the publications of the Asiatic Society of Bengal teem with numerous papers on insects of various groups which could not be easily listed in this short paper. The Bombay Natural History Society which was started by a few residents of Bombay in 1883 issued the 1st number of its journal in 1886. Since that date the society has become very popular and numerous papers on insects have been appearing in the pages of their journal under the authorship of many distinguished Entomologists with beautiful illustrations, and this journal is today the foremost natural history periodical in all Asia. One great difference between this journal and the Asiatic Society's journal was that while the latter was devoted to all kinds of scientific subjects like Mathematics, Ethnology, Geology etc., the Bombay journal was started as a purely natural history periodical and the pages were open chiefly for subjects on animals and plants. The names of Davidson, Bell, Aitken and others will ever stand prominent in the early history of this most useful and well established society with its widely circulated and popular journal which is nowadays a splendid medium for young and enthusiastic workers to publish their papers. Thus, during the closing decades of the past century workers on Indian Entomology considerably increased and the output of publications became appreciable. Papers on Indian insects not only appeared in the Indian periodicals noted above but were published in English and Continental journals also. The Transactions of the Entomological Society, the Annals and Magazine of Natural History, the Manchester Memoirs etc., of those years contain numerous such papers by well known men like, Hampson, Distant, Cameron etc. The regions explored entomologically in those days were chiefly the hills such as Assam, N. W. Himalayas, Nepal, The Nilgiris, Western Ghats, The Pulneys, Anamalais, Travancore etc. Of well known S. Indian works are those of Hampson, Arrow, Sharpe, etc., on the Nilgiri insects, Bell and Davidson's works on the insects of Kanara, Annandale's Entomology of the Ramnad District, Bolivar's monograph on the Orthoptera of St. Joseph's College, Trichinopoly etc., etc. Among these

numerous papers worth noting is one by J. A. Rothney on "Indian ants" collected during his tours all over S. India in 1893 for a record of how to his great surprise the author found reams of paper in the stationery godowns of the Madras stationer V. Perumal Chetty free from white ant attack and how this was explained by the proprietor as being due to the existence of a small red ant which keeps away the white ant pest—an early record of a biological method of insect pest control! By this time the Government of India finding the necessity and use for reference works on Indian Zoology started the "Fauna of India" series and the first work on insects appeared in 1892. This was the monumental publication of Sir George Hampson in 4 volumes on the moths of the Indian region. In the wake of these followed the classical publications of Marshall, Moore, de Niceville, Swinhoe and Bingham on Indian Lepidoptera, Hymenoptera etc. Since then, several volumes on the different groups of Indian insects have appeared in the "Fauna" series and these volumes are of such value that they will always remain as the basis for all future workers on Indian insects. In the year 1888 interest in the economical aspect of Entomology began to be evinced by the Government of India in the Revenue and Agricultural Department, and at the suggestion of Sir Edward Buck, the then Revenue Secretary, the publication of periodical notes on Economic Entomology was started by the trustees of the Indian Museum, Calcutta. Mr. Cotes of the Indian Museum issued the first part of it. From 1889 onwards this well known publication called " The Indian Museum notes" appeared in five and odd volumes up to the year 1902. These volumes contain a fund of information on Indian Entomology in general and the economic aspect of the subject in particular and the credit of publishing these valuable volumes goes to Cotes, Atkinson, de Niceville, Alcock and Stebbing.

The year 1903 might be regarded as an important stage in the history of Entomology in India, for it was in that year that the Government of India appointed its first official Entomologist to be attached to the newly started Agricultural Research Institute, Pusa. This responsible post was held for over a decade by the late Prof. Maxwell Lefroy whose death under very tragic circumstances was recently reported and under whom the author of this paper had the privilege of working for over two years. The nature and the bulk of Entomological work done in India since this date under the auspices of Government is all an open page and needs

little explanation here. The two valuable volumes of Lefroy on "Indian insect pests" and "Indian insect life" will always remain the A. B. C. of Indian Entomology for amateur Entomologists inIndia for all time to come. Besides these two, numerous bulletins, leaflets and memoirs have been issued under the authorship or editorship of Lefroy, mostly on economic Entomology. Due to Lefroy's activities interest in the subject was aroused in the provinces and the Madras Government was the first to create the post of a Provincial Entomologist of its own. Most of us know the work of Mr. Bainbrigge Fleetcher who was appointed as Madras Entomologist in 1912, especially his very useful book on "Some South Indian Insects" published in 1914. His promotion to Pusa as Imperial Entomologist to succeed Lefroy gave him better facilities for work and the several bulletins, etc., issued from Pusa bear evidence to his prodigious energy and enthusiasm for Entomological work. Other provinces followed Madras, and now the Punjab, and the United Provinces have also their Government Entomologists. Meanwhile interest in Forest Entomology was also evidenced by Government and Mr. Stebbing who was the first Forest Zoologist at Dehra Dun in 1903 inaugurated work on Forest Entomology which has in recent times considerably developed under Dr. Beeson the present incumbent. Stebbing's "Manual of Forest Zoology for India" was published 1908. By this time the Zoological Survey of India under Annandale started the "Records of the Indian Museum" and numerous papers on Indian insects began to appear in that journal also. Other circumstances and the appearance of Plague in different parts of India gave an impetus to the investigation of insects in their relation to man and his welfare: thus the study of medical and veterinary entomology arose and numerous papers on mosquitoes, fleas, flies, ticks etc. have been published by well known medical experts like Drs. Christophers, Patton, Donovan, Lieshmann, Cragg, Alcock etc. Col. Patton's work on Medical Entomology appeared in 1913. In this very brief survey of the different aspects of entomological work of this modern period I should certainly be failing in my duty if I do not pay some tribute to the remarkable work of the sons of the soil in the various parts of India, since they have contributed not a little to the substantial progress that has been possible on the subject; unfortunately, however, Indians are mostly placed in subordinate positions and for them to come to line—light is no ordinary feat—as many of us know by experience. One of the important problems

of enthusiastic scientists in subordinate position nowadays is not the difficulty of doing good work and producing papers worthy of publication by any decent journal, but is the hard and delicate task of steering their productions successfully through many of the shoals and quicksands of administrative machinery, which have nothing to do with the science! I may emphatically add that the bulk of the work enumerated above would have been possible only with the substantial help of able Indian officers all over India; and nowadays numerous papers in Entomology have also began to appear in their own names—a hopeful and happy sign of the times.

In a historical review of the rise of a science like Entomology in India it may not be inopportune just to add a few words regarding the contemporary growth of the science in some of the other countries, though it is not possible in a brief paper like this to give any details. A knowledge of animals including insects was prevalent in Europe in the days of Aristotle, Pliny and other early philosophers and recent works on insects appeared much earlier in the continent than anywhere else. A list of some of the early entomological productions which I add at the end of this paper in a chronological order will show that from 1475 onwards publications on insects began to appear in Europe. In Great Britain the earliest work on insects so far as the writer could find out appeared in 1623. During the 17th and the 18th centuries the science made considerable progress both on the continent and Great Britain as a result of the work of famous naturalists like "Dee Geer" Reaumur, Swammerdam, Linnaeus, Geoffrey, Fabricius etc., on the continent and Wolridge, Godaert, Brookes, Drury, Harris, Martin, Kirby and Donovan in Britain. By the beginning of the last century well known Entomologists like Curtis, Westwood and numerous others brought out valuable publications on English Entomology and these latter form the foundations on which all modern work on the subject has been built in England. The science also made rapid strides both in Europe and America and great savants in Entomology produced numerous monographs, catalogues and memoirs on various groups of insects which form monumental productions on the subject. With regard to official recognition of Entomology by Governments as an important subject having some economic value, the United States Government appears to have been the first to realise the same. As early as 1831 a quasi—official work on Entomology was begun in America

proceed to some of the Western countries where the science has made phenomenal progress and get some familiarity and touch with the up-to-date advances so that on their return their knowledge may be useful not only to the individuals but also to the country at large.

A Dates of some early Entomological publications

GREAT BRITAIN.

1623. The Feminine Monarchie or History of Bees. London.
1634. Moufet. Insectorum sive Minimorum Animalium Theatrum. London.
1657. Purchas. A theatre of political flying insects (Bee etc.) London.
1662. Godaerdt. Metamorphosis of insects. London.
1720. Albin. Natural History of English insects.
1744. Reaumur. Natural History of Bees. London.
1747. Gould. Account of English ants. London.
1764. Stevenson—Management of Bees. London.
1764. Brookes—Natural History of insects.
1770. Drury. Illustrations of Exotic Entomology.
1778. Harris. "The Aurelian". London.
1782. Harris. An exposition of English insects.
1786. Speechly. Insects of Hot houses. Dublin.
1787. Adams. On the microscope and insects.
1792. Martins. English Coleoptera.
1792. Donovan. Natural history of British Insects.
1815. Kirby and Spence. Introduction to Entomology.
1823. Curtis. British Entomology.
1828. Stephens. Illustrations of British Entomology.
1838. Westwood. Entomologist's Text Book.
1881. Ormerod. Pamphlets and Book on injurious insects (many followed these.)

EUROPE.

1469. Pliny. Natural History.
1475. Conrad. Das Buch. Der. Natur (with a chapter on insects) Augusburg.
1565. Allianus-De Animalium natura.
1602. Aldrovandus-Deanimalibus et insecte libri septum (1602)
1669. Swammudam. Hist. Insectorum generalis. Utrecht.
1671. Redi-Generationeum Insectorum-Amsterdam.
1704. Poypart. Hist. du Formica-co.
1719. Reaumur. Hist. des Guespes.
1734. Reaumur. Mem. Nat. Histy. Insects. Paris.
1742. Lesser and Lyonat. Theologie des Insectes. Paris.
1752. De Geer. Mem. N. H. Insects. French. Stockholm.
1758. Linnaeus. Syst. Nature.
1762. Geoffrey. Hist. Insects. Paris.
1763. Schaeffar. Elementa Entomologia-Regensburg.
1775. Fabricius. Syst. Entomologiae.
1791. Thunberg. Insect. Classiffication. Gottingen.
1796. Latreulle. Genera Insectorum, etc. Brief characters.
1832. Burmeister. Handbook of Entomology (Severa followed this).
1834. Cuvier. Animal Kingdom (Insects).

AMERICA.

1823. Thomas Say. American Entomology.
1837. Kirby. Fauna of N. American insects.
1847. Fitch. Insects of New York.
1850. Harris. Lepidoptera of Lake Superior.
1862. Harris. First report of pests.
1865. Cowan. Curious facts in the history of insects.
1872. Ebell. Structure and classfication of insects.
1872. Packard. Studies in Entomology of Hexapoda.
1886. Packard. Guide to study of insects.

B. Infomation regarding Entomolgical Institutions and Journals.

1. Zoological Society of London. 1830.
2. Entomological Society of France. 1832.
3. Entomological Society, of London. 1833.
4. Royal Agricultural Society England 1840.
5. Entomological Society of Belgium. 1857.
6. Berlin Entomol. Zeitschrift. 1856.
7. American Entomological Society, Philadelphia. 1859.
8. Horae Society Entomological Rossicae. 1861.
9. Division of Entomology. U. S. A. 1863.
10. Entomologist's Monthly Magazine, London. 1864.
11. Entomologist, London. 1866.
12. Canadian Entomologist. 1869.
13. The Entomologist's Journal Psyche U. S. A. 1874.
14. Economic Entomological work in Florence. 1875.
15. U. S. National Museum Proceedings. 1878.
16. Brooklyn Entomological Society. 1878.
17. Entomologist Tidskeft. Stockholm. 1880.
18. Entomological Society of Washington. U. S. A. 1884.
19. Ministry of Agriculture, Rome. 1887.
20. Board of Agriculture in England. 1889.
21. Entomological News, Philadephia. 1890.
22. Tropical Agriculturist Ceylon. 1882.

Association of Economic Entomologists U. S. A.

International Institute of Agriculture, Rome. 1905.
Agricultural Journal of India. 1036.
Journal of Economic Entomology. U. S. A. 1908.
Bulletin of Entomological Research, London. 1910.
Spolia Zeylanica, Ceylon. 1903.

Note :—Only a few of the more prominent and old institutions and periodicals havebeen noted here.

COURT OF WARDS AND AGRICULTURE.

M. A. Balakrishnan, L. Ag

I owe it to you to explain how I came to write about the subject of this paper. As a native of one of the biggest Zamins in the south of the Presidency. I have ever taken an interest in the study of the agricultural conditions of the Zamin to which I belong. Naturally, agriculture affords the best chance for improvement and progress and the thought how this Department can materially increase the prosperity of the states under the Court of Wards, has more than once. struck me. Even now. I have made an attempt, in this short paper to depict the conditions as they exist in the Zamins, how the Agricultural Department can do some useful work here and what limitations and difficulties beset us and how bes we can surmount these obstacles.

2. Although my object is to show possibilities of service and improvement as regards the entire court of wards estates in this Presidency, for illustrative purpose, I will confine myself mainly to the Ramnad District. giving particulars, I have gathered from the Sivaganga Zamindari from where I hail.

3. The total area of the Zamindari tracts in the Madras Presidency is 26·3 million acres exclusive of the Agency tract and this is nearly 29 per cent of the area of Presidency. Again in the southern districts, the striking feature is the large preponderance of Zamindari tracts over those held on ryotwari tenure. Taking the district of Ramnad in particular as representing one of the southern districts, the total area for the district according to the statistics of 1912–13 is 20,75,000 acre of which 10,50,000 or over. 50 per cent are Zamin lands ; this fact alone is sufficiently strong to impress us with the importance of the subject, for in any agricultural improvement the area affected is necessarily an important factor. But there are other accumulative causes to show why we should bestir ourselves in this direction.

It is but natural to expect that these Zamindars owning extensive areas of land would do something to improve the agricultural conditions of the ryots within their estates. On the contrary nothing seems to have been done on any systematic basis. The reason is not far to seek for this lack of enthusiasm on the part of the Zamindars. For in the permanent sanad given to them by the East India Company, the following appears :—

(1) That no Zamindar or proprietor was entitled by law, custom or usage to make his demands for rents according to his convenience.

(2) That the cultivators of the soil had the solid right from time immemorial of paying a defined rent and no more for the land they cultivated.

Apparently these conditions in the permanent sanad seem to have restricted their agricultural activities in this direction. But a idea of the system of land tenure prevailing in these estates would show us clearly that there are a number of avenues for the Zamindars to increase their annual income from their estates.

The following are the prevailing systems of land tenure in the Sivanga Zamindari :—

(1) Dharmasanam lands, (2) Inam lands and (3) Pannai lands. Dharmasanam lands are those under the occupation of ryots or tenants who have got saleable interest in the lands. They pay a nominal poruppu or fixed rent to the Zamindar and the income from this class of land is always a definite sum.

(2) Inam lands are those which are granted to persons for services rendered, or for any charitable purposes. The Zamindar collects a nominal rent from the cultivators and the income from this class of land is also definite sum.

(3) Pannai lands are those in which the Zamindar owns both the land lords' and tenants' rights. He can lease out the lands to any one he likes. The income to the Zamindar from this source is subject to fluctuation according to yield.

In the Sivanga Zamindari in particular there are about 2,200 villages covering an area of 1,800 square miles of which 700 villages are Dharmasanam, 420 Inam and 9080 pannai villages Clearly the Pannai lands are the main source of income to the Zamin and it is there that more interest should be evinced, although any agricultural improvement is sure to affect all the three kinds of lands.

The most interesting point in the zamin is the total amout of annual income. This varies according to the yield of the Pannai lands and ranges from a minimum of Rs. 20 lakhs to a maximum of Rs. 26 lakhs. The fluctuation of Rs. 6 lakhs which is nearly

one third of the annual income gives us an insight into the possibilities of not only keeping it up to the maximum, but even going beyond it considerably.

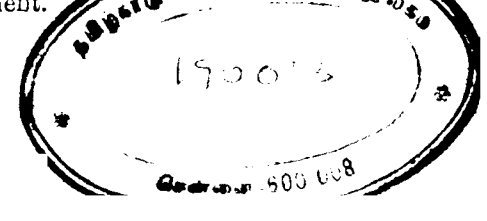
This is where the Agricultural Department comes in. The Department should set itself to organise with a definite aim and purpose to improve agriculture in these tracts. A scheme on practicable and working lines should be chalked out and adhered to.

Of course the statutory limitations, the tenure of the court and the solvency in general of the zamins are some of the difficulties that stand in the way of effecting any elaborate schemes of agricultural improvement in these tracts. There are however ways in which the management of the Zamins can aid in the improvement of agriculture without heavy initial outlay. To start with therefore such Zamins as have an annual collection of Rs. 20 lakhs and above and such as are under court of wards management should be taken up, for doing any agricultural work. I pointedly say court of wards as against the Zamins in general for the reason that the court of wards is being managed by Government and the Government therefore stands in the capacity of trustee to these estates. It necessarily becomes the duty of Government to see that the maximum revenue is collected on behalf of the court of wards estates at the same time benefitting the ryots of these tracts.

I believe I have made it clear that the extent of the zamin and the system of land tenure prevailing there, are such that it is imperative and even justifiable that Government should interfere on behalf of the court of wards estates and do something to improve the lands and the methods of cultivation there. The proprietors of other Zamins what own extensive areas of land would be sure to follow the example that we may set forth in a court of wards estate in this direction.

Having emphasised the necessity and importance for the interference and influence of the Government let me now submit a few hints regarding the opening of agricultural stations in the court of wards estates.

(a) The spade work has to be done by making a systematic agricultural survey of the tract. The different crops grown in the locality, their methods of cultivation and yields should be brought into a statistical analysis and this analysis will show the possible avenues for work and improvement.



(b) A small fraction of the revenue of the court of wards estate say 0·5 per cent should be set apart for the agricultural work within the estate. If estates having an annual income of at least Rs. 20 lakhs are selected we would have Rs. 10,000 left exclusively for this work.

(c) About 30 to 50 acres of land should be the extent of the farm and 75 % of this area will be under demonstration and 25 % for experiments.

(d) The management of the farm should be by one of the officers of this Department. In fact, I would suggest that every circle officershould have at least one zamin in his jurisdiction. This is quite necessary for the reason that as a member of the Department he will be in touch with the different tracts of the entire Presidency and whether for procuring better seeds, varieties or manures or implements or for carrying out improvements approved after trials by the Department he will be the best fitted. Otherwise these farms under the hands of non-technical and experienced men would be a failure.

I will illustrate this from my Zamin. The chief crops grown there in order of their acreage are paddy, ragi, cambu, groundnut, cholam cotton etc., I shall take up the cultivation of paddy This crop covers an area of $1\frac{1}{4}$ lakhs of acres every year. Our improvements in the direction of paddy cultivation are economic planting, green manuring, better method of ploughing and better strains of seed. By a regular and systematic adoption of these improvements we have obtained an average yield of 4,000 lbs. of paddy per acre in the Central Farm wet lands.

Taking Rs. 10 as the minimum of profit under the introduction of these improvements the profit from paddy cultivation alone would be about $12\frac{1}{2}$ lakhs of rupees and the court of wards can be benefitted to an extent of at least of 5 lakhs from its 1080 Pannai villages. I would like to show the possibilities of improvement in other crops and in other directions as well, but it will be too many for an enumeration here. Still I am rather tempted to point out that according to 1912-13 statistics there were 81,000 and odd acres of cultivable waste. The average rainfall in the tract for 27 years was 32.92 inches and this is generally scattered over 9 months in the year. Considering the extensive areas of

cultivable waste available, and the even distribution of rainfall in these tracts there is abundant scope for a successful breeding of livestock. The tract is already possessed of a special breed of cattle known as "Pullikulam breed" and the animals are very smart and spirited.

My only suggestion therefore is that as a beginning big zamins under court wards management should be investigated on the lines of my suggestion and wherever an interference by Government is justifiable, steps should be taken to improve the agricultural condition on behalf of these court of wards estates.

So far I have dealt with the possibilities of effecting improvement to the zamin lands; but the question will arise whether by helping in this direction the Government will derive any proportionate advantage. This question is easily solved when we consider the benefits arising from the department taking these zamins as a field of their activities.

There are eight circles in this Presidency and according to my scheme there will be at least eight such farms in court of wards lands. These farms cost little or nothing to Government to start with. They are easily managed with the co-operation of the heads of the court of wards management.

Some of the objects for which this department stands for are also easily solved through these farms. This would be a place of an agricultural centre for the opening of implement and manure depots, a medium for the introduction of new strains of seeds providing facilities at the same time for the demonstration of the Agricultural Department.

Above all, a point of greatest importance is that these farms would serve as convenient units for the several experts of the Department to carry on their experiments quite economically and efficiently under varying conditions of season, climate, soil, etc., a factor quite essential for an agricultural experiment. It is economical for the reason that these farms cost nothing to Government and efficient because the supervision of such farms would be under the hands of a qualified and experienced officer of this Department.

CURRENT TOPICS.

Money lenders and Farmers.—"Free with their money" —£ 60 interest on a loan of £ 70.

Some remarkable statements respecting dealings with money lenders were made at Newtown Bankruptcy Court by a Shropshire farmer whose deficiency amounted to £ 1035.

Examined by the Assistant official Receiver, the debtor stated that, owing to various losses in 1922, he resorted to moneylenders. Asked why he went to them, he replied: "Well, you get such lovely letters from them." He wrote to one moneylender who sent him a packet of notes.

"And you signed an agreement and fell into the trap?" asked the Receiver.

"Yes. The first sum I had was £ 100, which I was to pay back in 10 months with instalments of £ 10 per month, and £ 30 down afterwards. I failed to pay the last draft, so the moneylender sent me some more money to pay it. It was vey useful, so I carried on. The first loan was discharged out of the second amount. I failed to pay the second. so he made me a third advance of 50 for £ 70'2s. In January this year I got £ 70 from moneylenders and was to pay back £ 130."

"Instead of paying such high interest to moneylenders, why did't you go to your bankers?", debtor was asked and replied, "I was silly, that is all, Sir."

"Did you tell this moneylender that you had loans from others?" —"No, they were so free with their money."

In answer to further queries, debtor said he always made enough money to pay every creditor until the moneylenders stepped in. He realized now that dealings with moneylenders was an expensive game.

(From the Scottish Farmer dated September 20, 1926).

Lamb Production of the World.—Sheep have been increasing in Australia in recent years and the unofficial figure for January 1st. 1926, indicated a still further increase from 83,083,000 in 1925 to 90,000,000. In New South Wales, which supports almost 50 per cent of the sheep in Australia, another big lambing is expected.

In New Zealand the lamb drop was rated at 90 per cent, due to a fortunate change in the weather at lambing time. The figure for sheep and lambs in April 1926, therefore, will probably show an increase. The average for 1925 was 82'43 per cent. The last lambing season in Uruguay was reported by the American Minister to have greatly increased flocks. No report is available for Argentina. In England and Wales the number of lambs born this spring has been a good average. The number of sheep in most important countries, with the exception of Germany and Denmark has been increasing steadily since 1923.

In most countries for which slaughter data are available the figures show increased killings of sheep and lambs over the period 1923 to 1925. In the leading importing countries, 1925 figures indicate increases over 1924, and over pre-war years in the case of Germany. In the extreme southern provinces of Chile and Argentina however, the 1926 slaughter is expected to be under the heavy 1925 kill. especially in Chile. according to the Review of River Platte for April 26th. Slaughterings of sheep and lambs in New Zealand in February numbered 1,333,000 carcasses, compared with 1,161,000 in 1925, an increase of 15 per cent.

The quantity of frozen mutton and lamb in store and loaded but not departed on February 28th was 2,081,000 carcasses compared with 1,565,000 at the same period of 1924 or an increase of 33 per cent according to the report of the New Zealand Meat Producers' Board. In Uruguay the slaughter of sheep has been especially heavy. The American Minister attributes this partly to the great increase in the flocks from the last lambing season and partly to the low prices for wool. Scant pasturage during January and February also caused many ranchers to market their sheeep rather than risk a prolonged drought.

The best indication of meat production in exporting countries are the export figures. According to those figures, 1925 was a better mutton and lamb year than 1924 for New Zealand, Argentina, and Australia, the principal exporting countries.

In the United Kingdom, the world's greatest importer of frozen mutton and lamb, supplies in 1925 were larger than for any year since 1921, according to Weddal and Co's annual review of the frozen meat trade. Imports of frozen mutton and lamb amounted to 600,000,000 lbs as compared with 557,275,000 lbs, in 1924 and addition of fresh killed imports, canned mutton and brings the total supply according to Weddel to 1,248,000,000 lbs. in 1925, as compared with 1,181,000,000 lbs in 1924. Home grown supplies are estimated at 634,000,000 lbs. as compared with 600,000,000 lbs in 1924. Lower wool prices were probably responsible for heavier home slaughterings. Argentina supplies were much larger than in 1924, with some increase in imports from Australia. New Zealand furnished more mutton than in the preceding year but less lamb. Imports from Uruguay were much smaller in 1925 than in 1924. For the first 4 months of 1926 imports of lamb and mutton into the United Kingdom were much larger than in the same months of 1925. As to the origin of 1926 imports, the situation was quite different from that of 1925. Imports from Argentina showed a very marked decline, while there was heavy increase in receipts from Australia and a slight increase from those from New Zealand. Imports from Uruguay registered a very heavy increase"

(From Journal of Agriculture, South Australia, September 1926).

THE GOOD INDIAN PLOUGH, BY JOSEPH MCINTOSH.

The Indian plough for a thousand ages
Has earned great gratitude and wages;
'Tis cheap and light and easily made,
And if it breaks you can get first aid.
In any village woodman's shop,
And waste no money when you stop.
There's only a solid *shisham* pole,
A block for the blade and a handled bole;
One hand guides while the other with care,
Drives the bullocks and clears the share,
It's fine on a July morn to see,
A million men turning o'er the lea,
If the monsoon falls with a gentle splutter,
One inch is enough for the ploughman's cutter.
While the modern machine for a big storm waits,
His elder brother defies the fates,
Though slow and sure and uncouth his moods,
He thanks his Gods and delivers the goods.
Though he knows so little—save bullocks and ploughs,
He feeds the nation—salaams and bows;
And though he gets only half the crop,
Bids hungry crowds and starvation stop.
Oh, science may rave and acclaim its worth,
What more can it force from old mother earth"
After all our palavers—commissions and pleading
Three hundred million he'll go on feeding;
Though hot heads battle and idlers play,
He'll wisely trudge in the same old way.
So here's a toast to the man at the plough,
And hearty cheers for his sunburnt brow.

(From Indian Scientific Agriculturist; August 1926).

NEWS AND NOTES.

New Year Honors:—The whole department and his numerous friends in India and elsewhere will be glad to know that Mr. R. D. Anstead, our Director, has been made a C. I. E. He is the second Madras Director to receive this distinction. We offer him our hearty congratulations.

Change in Principalship:—Mr. R. C. Broadfoot, Principal and our President, went on 9 months leave from the 3rd of this month andwe are glad to inform our readers that Rao Saheb M. R. Rv. M. R. Ramaswami Sivan has been made Principal and becomes our President. The Rao Sahib as an agricultural student, as a teacher of several years' standing, as a co-founder with Mr. R. C. Wood of this Union, as its strong supporter and well-wisher, will, we hope, further the cause of agricultural education in this Presidency. In this connexion his services in the Senate, in the Academic Council and in the Board of Studies cannot be lightly forgotten. He is the first Indian Principal of the Agricultural College at Coimbatore.

Agricultural Teachers:—Mr. R. Swami Rao, an L. Ag. of over10 years' standing, who was Teaching Assistant at the College and who was later Agricultural Demonstrator, Cuddappah, has been sent to the Teachers' College at Saidapet for being trained in teaching methods. Mr. Rao is the son of the late Mr. R. Giri Rao, the selfless founder and Principal of the Madanapalle High School. We hope that when Mr. Swami Rao comes out shortly, his services will be utilized to the full in furthering the cause of agricultural mass education which is a vital question of the day.

A Madras Entomologist on World Tour:—Mr. T. V. Ramakrishna Ayyar, Assistant Entomologist of this College left on a world tour a few weeks ago and is now in San Francisco. He expects to spend almost a half year in important centres in America and on his way back to India will pass through England and a few countries of Europe. That Mr. Ayyar should have undertaken this tour at his own cost and at an advanced age—for he is now nearing 50—bespeaks a resolve not quite common and a desire to get into close touch with modern laboratories and renowned workers in Entomology.

Representative in the Academic Council:—Mr. C. Tadulinga Mudaliyar, Lecturing and Systematic Botanist, has been elected to the Academic Council of the Madras University by the teaching staff at the College. With his 25 years' experience as a Botanist, his services should be of value to the Council.

Our Vice-President:—We congratulate Mr. C. Tadulinga Mudaliyar on his confirmation in the Indian Agricultural service which was long overdue and we are sure the agricultural department and those who know him also join us in offering the felicitation. Mr. Mudaliar has been the head of the Botanical section virtually since January 1923. Our readers are aware of his work in the Botanical line, amongst students and on behalf of the Union for several years.

Representation of the Agricultural College in University authorities.

Ex-Officio:—Member of the Senate:—Mr. R. D Anstead (As Director of Agriculture).

Member of the Academic Council:—Rao Sahib M. R. Ramaswami Sivan (As Principal.)

Nominated:—Member of the Council of Affiliated Colleges Mr. R. D. Anstead.

Elected:—Member of the Senate:—Rao Sahib M.R. Ramaswami Sivan (by the constituency of Registered Graduates.)

Member of the Academic Council:—Mr. C. Tadulinga Mudaliar (by the College staff.)

The Academic Council of the University of Madras has passed a resolution including agriculture as one of the optional subjects which could be brought up by candidates for the Intermediate Examination. As Arts Colleges will be required by the University to teach agriculture, only on satisfactory proof being given of the provision of facilities for teaching practical agriculture, as judged by a Committee of Inspection appointed by the University, we are confident that the course will be useful. It is now for Arts Colleges to come forward to take steps to teach agriculture as one of the optional subjects for the Intermediate Examination.

An Egyptian Official's Visit :—Mustafa Uzdiadi effende, Horticulturist to the Khedivial Department of Agriculture, Cairo was on a short visit to Coimbatore. He spent three days in visiting the several sections and laboratories besides running to Simm's Park, Coonoor, for a day. His address to the agricultural students on Egypt and her agriculture was much appreciated.

The new Budget :—We understand that the Director's repeated attempts at securing larger grants and more staff for his department have borne fruit. We hear experiments on 'Soil Physics' will be undertaken at Hagari. A new Bacteriologist has been appointed and a number of agricultural demonstrators are being added on.

Arrivals :—Mr. G. R. Hilson, the permanent Cotton Specialist, returned from leave on the 21st of December and resumed charge of his duties from Mr. R. C. Broadfoot.

Mr. H. Shiva Rao who was away on study leave in England came back towards the close of the year just ended. He has now been promoted to the Gazetted rank as Assistant Lecturing Chemist. He has been fortified with very good qualifications, viz., Diploma in Agriculture at the Cambridge University and his training in the 'Soil Physics department' at Rothamstead under Dr. Keene and Mr. Newman.

Students' Tour :—Students of Class II were taken on tour this month to the southern districts by the Professor of Agriculture, Mr. Saadat Ullah Khan. They visited Koilpatti, Virudunagar, Madura, Tanjore, Trichinopoly, and the cattle-breeding centre Palayakottai and acquainted themselves with local agricultural practices and crops. Messrs. C. Tadulinga Mudaliar, T. V. Subramanyam, H. Shiva Rao and S. N. Chandrasekhara Iyyar also accompanied the party.

Tanjore Ryots' Conference :—On the 9th instant the Tanjore ryots met at a conference at the Aduthurai Paddy-breeding Station under the President-ship of Rao Bahadur J. Chelvaranga Raju. The conference was opened by the Hon'ble Minister; departmental officials and the ryots had a very enjoyable day and a heart-to-heart talk on agricultural work.

NOTIFICATIONS.

Mr. C. Tadulinga Mudaliyar is confirmed as Government Lecturing and Systematic Botanist in the Indian Agricultural service with effect from 3rd September 1926.

Mr. K. T. Alwa, Assistant Director of Agriculture on relief by Mr. D. Ananda Rao Garu, to the VIII Circle.

Mr. K. Gopalakrishna Raju, Assistant Director, extension of leave on half-average pay for one month in continuation of two months' leave already granted.

Mr. H. Shiva Rao, Upper Subordinate, IVth Grade, to act in the temporary post created in the Madras Agricultural Service till 15-5-'27.

Appointments :—Mr. G. K. Chidambaram, B.A., (Hons.) to officiate as Assistant, V Grade, in the Agricultural Chemist's Section.

Messrs. P. Anantanarayanan and K. Brahmachari to be temporary Assistants in the Entomologist's Section on Rs.85-5-120.

Messrs. C. Sankaran Nambiyar and P. A. Narayanan Nambiyar to be officiating sub-assistants in the Entomologist's Section.

Leave :—3rd Circle :—Mr. S. M. Kalyanarama Ayyar, Cotton Assistant, Nandyal, leave on average pay for one week from 3—1—27.

4th Circle :—Mr. A. J. Mascarenhas, Demonstrator, extension of leave on average pay for one month and 17 days.

6th Circle :—Mr. S. V. Doraiswami Ayyar, Demonstrator, leave on average pay for two days from 3-1-27.

7th Circle :—Mr. M. P. Sankaran Nambiyar, Agricultural Teacher, Taliparamba, leave on average pay for 6 weeks from 3-1-27.

8th Circle :—Mr. K. Avadainayakam Pillai, Demonstrator, leave on average pay for one month from 17-1-27.

G. A. C's. section :—Mr. S. Kasinatha Ayyar, Assistant, extension of leave on average pay for one month.

Mr. M. R. Balakrishnan, Assistant, leave on average pay for two weeks from 12-1-27.

C. S.'s section :—Mr. P. Narayanan Nayar, Manager, leave on average pay for one month from 5-1-27.

G. M's. section :—Mr. D. Marudarajan, Assistant, leave on average pay for one month from 3-1-27.

G. E.'s section :—Mr. N. Krishna Menon, Sub-Assistant, leave on average pay for two months from 3-1-27.

Mr. R. Narasimhachari, Sub-assistaat, leave on average pay for two months from 3-1-27. Mr. A. G. Ramaswami, Sub-assistant, leave on average pay for one month from 10-1-27.

EDITORIAL

The Madras Ministry

The third Council under the Reforms Act has witnessed the installation of a Ministry composed of Independents. Amongst the elected members it is certainly difficult to find a more tried and better equipped Ministry than the present one.

The Hon'ble Dr. P. Subbarayan by reason of his position as an enlightened member of the landed aristocracy, by his intellectual attainments and by his work in the Council and outside is well fitted to be the leader.

The Hon'ble Diwan Bahadur R. N Arogiaswami Mudaliyar has been known to be a zealous worker and a sympathetic official. His long career in the Public Works Department in several districts and his close acquaintance with the wider public certainly entitle him to a seat in the cabinet.

The Hon'ble Mr. A. Ranganatha Mudaliyar is known for his selfless work. Through devotion to the ideals he has placed before himself and his untiring efforts in working up to them he has endeared himself to those who have watched his career during the past twenty years. No one can, even for a moment, doubt his sincerity and industry in attacking problems he wishes to make his own.

Speaking at one of the public meetings in Madras within a few days of taking charge of his high office, Mr. Mudaliar stated that unlike his two colleagues who had two administer old departments with large traditions behind them, he had to run the comparatively new departments and to that extent, he would have a more difficult job. He was optimistic at the same time because he said he had a number of ideas and was soon getting himself sure of his ground before he ventured to put them into practice. He has already made a number of speeches, more or less declaring that his regime will be one of progress all round. One of his first tours was to the Paddy Breeding Station at Aduthurai and from what he saw and spoke we find he was well impressed with the work of the department. We hope that such development departments as are entrusted to his care will receive his best consideration and attention during the next three years.

Composed as the present Ministry is of gentlemen with enlightened and independent views, the public can certainly forestall further advances in the popularisation of the administration. We wish the Ministry all success in their honest efforts to improve the condition of the masses.

Viceroy and Agriculture.

Lord Irwin has had the unique honour of being the first Viceroy and Governor-General of India to quicken the imagination and to rouse the interest of the student-population in Agricultural pursuits. It was a happy idea that struck His Excellency that one of the best means of securing this object was the award of prizes for essays on specified portions of agriculture tendered by University students. That a gold medal should be given for the best essay in all India and a silver medal to the best essayist from each province shows His Excellency's acquaintance and knowledge of human nature and his anxiety to get a wider acceptance for his idea. We hope that future years will see such medals being given and endowed by more governments, Rajahs and noblemen. We understand that a fairly large number of students have competed for the prize from this Presidency.

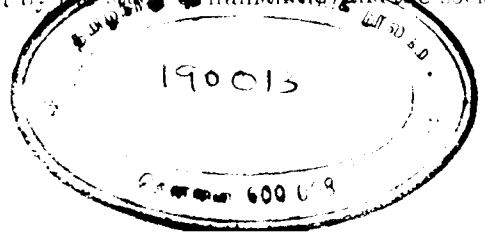
Royal Commission on Agriculture.

On a former occasion we had the pleasure of referring to the appointment of the Royal Commission on Agriculture in India. Now

we are in a position to give some views on actual experience since the Commission met at Simla on 10th October last and of its proceedings in the several places it has visited. The Commission, we need not point out, is composed of veterans and if the evidence placed before it is not of a character that will enable recommendations being made to satisfy Indian aspirations, it will not be the fault of the Commissioners. The questionaire issued was fairly full and no experienced public man could have viewed it with feelings other than those of appreciation. We are glad to note that the trend of evidence has, on the whole, been in the direction of quickening the desires among the masses and of the educated public generally for improvements on rationalistic lines. Most witnesses examined so far have urged the need of cooperation for ameliorating the condition of the cultivator. Opinions have differed, and sharply too, on the question of a Central Board for tackling fundamental problems. Dr. Mann and Mr. Clarke are against centralization while others are not of that view. So long as Agriculture and allied Development problems are transferred subjects for which Ministers are responsible to local Legislature—the tendency and the clamour has been for transferring more subjects to the Ministers—it may not seem quite expedient to have a Central Board which is not under the control of the Provincial Governments. All, however, are agreed on increased expenditure on Agriculture and it remains to be seen whether at the time that the recommendations of the Commission are placed before the Assembly for discussion a year or two hence, experts and the discerning public will solidly vote in favour. Anyhow it is premature to anticipate the recommendations or pronounce any *obiter dicta* on the work of the Commissioners several months ahead.

The most outstanding figure in the Commission is the Marquis of Linlithgow, the Chairman. Everyone that had occasion to witness the sittings was impressed with the most excellent way in which he guided the proceedings and the marvellous grasp of the subject he showed, while taking oral evidence.

The few words of advice he gave to the student's whom he met at the College Hostel showed his catholicity of views. His remark is still in our minds that an agricultural student should not confine his attention to his special subject alone but should also have his outlook widened by the study of humanities and the social side of life as well.



SULPHATE OF AMMONIA.

INDO-AGRI, LTD.,

AGENTS: SHAW WALLACE & Co., MADRAS.

Numerous Depôts for the retail sale of Sulphate of Ammonia to Agriculturists have now been opened in South India from which this essential Nitrogenous fertiliser can be obtained at any time and in any quantity at the fixed uniform **cash price of Rs. 8-8-0 per bag of 80 lbs.** gross (one Federation Maund).

If 4 bags ordered at a time it will be supplied F.O.R. buyer's nearest Railway Station at the same price.

"Star" Brand Sulphate of Ammonia is a Product of the British Sulphate of Ammonia Federation, Ltd., and is Guaranteed to be of Neutral quality and to contain not less than 20·5 per cent Nitrogen = 25 per cent Ammonia.

Arrangements have now been made to stock **Superphosphate** also for the convenience of those who wish to apply these two fertilisers together.

A list of our Depôts with names of Inspectors in charge, Propagandists & Sub-Agents and addresses is given, below.

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2. Tanjore.	Caddel's Road, opposite Ex. Engineer's Office.	S. Varadachari, L. Ag.
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3. Trivellore.	167, Bazaar Street.	P.R. Venketeswara Iyer.
4. Villupuram.	306, Pondicherry Road, Junction:	N. V. Viswanatha Iyer L. Ag.
5. Madurantakam.	19, Annapillai Ranga-chari, Street.	C. Doraiswamy Mudaliar.
Asst. Propaganda Inspector Guntur.	**Consulting Agrist. Guntur.**	**Darisi Chenchiah B.Sc.**
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