

come to be known in every province of Northern India and have extended from India to various sugar cane producing countries. In Northern Bihar these seedlings, by their superior sugar yield have shown conclusively that good canes of high sugar content can be grown in this section. The results achieved during the short period since the introduction of these canes have unquestionably justified the expenditure on this station. The introduction of these seedling canes has developed and stimulated the sugar manufacturer in India and marks an advancement which can be attributed practically entirely to the good influence from the work of the station.

We note with pleasure the establishment of this station on a permanent basis and look forward to still further betterments through the excellent research and investigations conducted at Coimbatore.

(The Planter and sugar manufacturer Vol. LXXVI No. 8.) Y. R. R.

A Review on the Tenure of Agricultural Land.

BY ORWIN AND PEEL.

"England has been a landlord's country; the state is entirely divorced from the land except when, as in the case of Crown lands it assumes the function of landlord. The whole rural system has been built up and has hitherto rotated round this central fact. Any incremental values that accrued during the course of centuries, whether the result of improvements or of any change in money value, pass in consequence to the landlord and tenant, the relative share between the two being adjusted in the rent. The State received no regular part of such increment though, owing to the rise in administration costs, such taxes as death duties which have in recent years been imposed, do form such a drain on estates, but a drain which is less satisfactory, because irregular in incidence.

The system has broken down; the landlord is a disappearing element from rural life and tenants are being forced to purchase to retain security though all evidence points to the absence of desire to purchase. Lack of capital for intensive development and lack of marketing facilities characterise the change and it is evident something must be done to rescue British Agriculture from the slough into which it has drifted. The authors propose a system of state purchase as distinct from nationalisation and elaborate the system in some detail with a fair statement of the *pros* and *cons*, though doubts may be entertained as to the advisability or effectiveness of a further host of officials.

The main interest from the general aspect, however, lies in the reasons for the practical difficulties. Since the State has no recognised status in relation to the land, private vested interests to the full incremental value have accumulated and the buying out of those interests constitutes the major practical difficulty in reform. In most tropical countries, especially in those hinterlands only now being opened up, a certain and, perhaps nebulous state ownership already exists; land is abundant and has an assured incremental value in the future. The question arises whether the state is wise to give up those potential sources of revenue in view of the inevitable increase of expenditure in the future. In those island and coastal areas in which, owing to early occupation, development has already progressed, the English system has already taken root but here also may it not be advisable to call a halt. At any rate the subject is worthy of study. The volume under review indicates clearly the dangers of a policy in which the State is entirely divorced from the land, and will well repay study from this aspect alone.

("Tropical Agriculture" January, 1926).

Union's Greetings to the New Viceroy.

The following telegram was sent to the Private Secretary to His Excellency Lord Irwin at Bombay on 1st April 1926.

"Madras Agricultural Student's Union, Coimbatore, tenders respectful greetings hopes advent of Your Excellency and Royal Agricultural Commission coinciding with celebration of Golden Jubilee of Agricultural Education by Union on July 12th, will presage an era of marked agricultural development."

The following reply from the Private Secretary was received :—
"I am desired by His Excellency to convey to you his thanks for your kind message of welcome on his arrival in India."

UNIVERSITY OF MADRAS.

B. Sc. Ag. Degree Examination, 1926.

PART I.

Engineering:—Wednesday, 7th April 7-10 A. M.

(Answer three questions in A and three questions in B. Questions 1 to 7 are compulsory. Write answers to questions in A and B in separate answer books.)

A

1. It is required to grow sugarcane in a rectangular area of a hundred acres situated on the bank of a river. At its highest point and nearest the river, the land is 50 feet above the river bed and has a fall of 5 ft. on its other boundaries. The summer and monsoon

levels of water in the river are, 1 ft. and 20 ft. respectively. Describe with sketches, how you would irrigate the land in the most economic way, giving details of any masonry work considered necessary and the sizes and kind of pump, piping, and engine you would use, with reasons or data for selecting those sizes.

2. How are engines, such as steam, two and four stroke oil and gas, denoted as regards their size or power? Describe the methods used for ascertaining their power.

3. Of what materials are the following parts made and why?

(a) Rollers of cane crushing mill. (b) Mould-boards of iron ploughs. (c) Crankshaft bearings of engines. (d) Impellers of pumps.

4. What are the functions of a threshing machine? Sketch the main parts, indicating the work they do, their movements, and speed.

B

5. An earthen channel has a bottom width of 10 feet, side slopes to depth 4 feet, and inclination $1\frac{1}{2}$ feet per mile. Find the velocity and discharge, co-efficient being 72.

6. A brick wall is 18 inches thick and 8 feet high, and the brickwork weighs 130 lbs. per cubic foot. The wind pressure on a certain day is 40 lbs. per square foot at right angles to the wall. Make out your calculation and state whether the wall will stand.

7. If you are to build a granary, say of 1,000 cubic feet capacity, describe the kind of structure you will put up, and the materials and precautions you will adopt to make it rat-proof and otherwise satisfactory.

8. Show, by dimensioned sketches, your design of a culvert to be built over the channel referred to in Question 5, suitable for the passing of country carts.

Botany. Wednesday, 7th April, 1 to 4 P.M.

(Answer three questions in A and three questions in B. Questions 3 and 5 are compulsory. Write answers to questions in A and B in separate books.)

1. Write an essay on the metamorphosis of roots, illustrating your answer with examples.

2. Describe with diagrams, giving examples, all the forms of dry fruits that you know of.

3. By what striking features would you be helped in recognizing the families of :—Cruciferae, Malvaceae, Umbelliferae, Rubiaceae, Asclepiadeae and Amarsllideae? Give a full account of the characteristics of Scitamineae and mention some plants of this family that are of economic importance.

4. Explain the following terms, quoting examples:—phylloclade, lysigenous, idioblast, phellogen, anthodium, syconium and coleoptile.

B

5. Point out the differences in structure and disposition of tissues between a dicotyledonous root and that of a monocotyledon.

6. Describe the various elements of a vascular bundle and their distribution in the stem of any dicotyledenous plant.

7. What constitutes the food of a green plant? How do they obtain them?

8. Give an account of the various functions of a green leaf pointing out the adaptation of structure to function.

Chemistry :—Thursday, 8th April 7 to 10 a. m.

(Answer three questions in A and three questions in B. Questions 1 and 6 are compulsory. Write answers to questions in A and B in separate books).

A

1. 1.000 gramme of an organic substance whose vapour density was 45 on combustion, gave 1.466 gramme of carbonic acid and 0.600 gramme of water. Write the constitutional formulae of all possible isomers having the above composition. Name them and explain the nature of isomerism exhibited by them.

2. Explain the significance of the term 'hydrolysis' as applied to the hydrolysis of aalkyl halides, esters, nitriles, and carbohydrates. How can the hydrolysis be brought about in each case? Write equations.

3. Starting with acetic acid, name the different compounds which can be derived from it. Show how each compound is obtained.

4 (a). What are the products of distillation of coal tar? How are they isolated? (b) Compare phenol with ethyl alcohol as regards constitution and chemical reactions.

B

5. Give a brief account of the chemical and physical properties of the proteins. By what means has their constitution been examined?

6. By what agencies is organic matter decomposed in the soil and what are the ultimate products formed? Describe briefly the chemical changes involved.

7. What salts injurious to crops are likely to occur in soils? What factors lead to their accumulation and what steps can you suggest for their removal?

8. What are the chief factors determining the water holding capacity of a soil? By what methods may the properties of a soil be improved in this respect.

Zoology. Thursday, 8th April, 1 to 4 P.M.

(Answer three questions in A and three questions in B. Questions 4 and 5 are compulsory. Write answers to questions A and B in separate books.)

A

1. Describe the general characteristics of the different kinds of individuals met with in a hive of honey-bees and explain clearly the part played by each in the general economy of the colony.

2. What are the animals closely allied to insects? Point out the chief structural similarities and differences between these animals and insects and give a short account of the economic importance, if any, of these animals to the farmer.

3. Name half a dozen of the more important insect pests which a kitchen gardener in South India has to fight against. State, with regard to each the family it belongs to, the damage caused to the plant, the names of the plants attacked, and the control measures you would suggest.

4. Write briefly what you know of the following:—(a) Fumigation, (b) Tropisms, (c) Pebrine, (d) Tapeworms, (e) Bot-flies and (f) Mimicry.

B

5. What are the chief insect enemies of the coconut-palm in South India? State briefly what you know of their life-history and what measures you would suggest to keep them under control.

6. How are insects important to disease? Give three definite instances that you know of, to illustrate how insects function as disease carriers.

7. How do insects help in the pollination of flowers? Which are the chief groups of insects that visit flowers? Show, by reference to two familiar instances based on your observation how they are specially modified to visit flowers.

8. Give a short account of the life-history and habits of the rice-bug. What measures do you suggest to bring it under control? How would you distinguish damage done to paddy by the rice-bug from that caused by other insect pests?

Agriculture I. Friday, 9th April, 7 to 10 A.M.

(Only 5 questions are to be answered.)

1. *Either*. Why is the study of meteorology essential to a scientific worker? Mention the instruments that would be necessary in this study, and describe how they can be used in the interpretation of his results. *Or*, Write short notes on:—(a) Palaeontology, (b) Lithosphere, (c) Cainozoic, (d) Epigene, (e) Stalagmite, (f) Gabro, (g) Basalt, (h) Fault, (i) Stratification, and (j) Schist.

2. *Either*. What are the fundamental problems of dry farming? How are they solved by Indian ryot? *Or* Comment on the statement that according to dry farming conditions, the fertility of the soil is maintained by cropping without manuring. Support your remarks with actual examples.

3. (a) A red-loamy field bore a crop of karunganni cotton during the season 1925—26. It has to be brought under Tenai and Redgram in the following season. Mention the various operations

that you would adopt to bring into tilth for sowing. (b) If you have 10 acres to sow and have only a three-tined drill and guntaka, describe the steps you would take to sow three rows of Tenai and one row of redgram; and estimate the labour required for sowing, and the time required to finish the operation.

4. Describe the following by means of sketches and state to what uses you would put them:—(a) Junior hoe, (b) Stone roller, (c) Triangular harrow, (d) Buckscraper, (e) Sabul plough, (f) Swan-neck hoe, (g) Chain harrow, and (h) Pick-axe.

5. What is meant by the "duty of water"? What are the factors which modify it? How does it vary for Sadaisamba and Chitrai Cholam?

Agriculture. II. (Animal Hygiene) Friday, 9 April 1 to 4 P.M.

(Answer three questions in A and three in B. Questions 1 and 5 are compulsory, write answers to questions in A and B in separate answer books.)

A

1. What are the diagnostic symptoms of Rinderpest, Foot and Mouth disease, Black quarter, Malignant sore throat, Tuberculosis, and Johne's disease?

2. Describe the causes of Garget in a cow. State what your treatment would be for such a case.

3. Give the actions, uses and doses of the following drugs:—Epsom salts, Sodii Bicarbonas, Alum, Asafoetida, Ginger, Castor oil Camphor and Sulphur.

4. What are the hygienic principles to be observed in constructing a cattle shed and a lambing pen.

B

5. Describe briefly the principles of disinfection, with reference to the common contagious diseases of animals of the farm.

6. What are the excretory channels in the ox and how are they necessary for the proper maintenance of health?

7. Write short notes on Red water, Coccidiosis and White scour.
 8. Describe the signs and course of normal parturition in cow.
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10th April 1926] *Zoology Practical* [Whole day.

1. (a) Dissect the specimen provided so as to show the various parts of the alimentary canal, naming the different parts (Earthworm).
- (b) Mount the mouth parts of the insect specimen provided (The banded blisterbeetle).

2. (a) From among the numbered specimens in the box, note down the numbers of ten insects which you consider to be of some economic importance.

(b) Identify specimens 1 to 10.

3. (a) Inspection of the collection of insects made by candidates and questions thereon.

(b) Oral Examination.

12th April 1926] *Engineering Practical* [Whole day.

Chain Surveying :—Throwing out and doing up the chain between 2 points; offsets; writing field book; making a hand-sketch of given bungalow for chain survey; calculating area of a figure, allowing for incorrect length of the chain.

2. *Levelling* :—Taking fly levels from the College to Students' Pavilion, touching on given bench marks: writing field book; reducing levels.

3. *Workshop* :—Carpentry; Preparing a teakwood couple as per design.

4. *Building works* :—Measurement of an existing building and calculation of quantities and cost for brickwork and plastering.

5. *Machinery* :—Start the oil Engine in Farmyard well, run for some minutes and stop the Engine.

6. Oral Examination.

15th April]

Animal Hygiene Practical.

[Whole day.

1. Identification of the internal organs of the cow.
 2. Uses of these internal organs in the animal economy.
 3. Identification of common drugs and instruments and appliances and their uses.
 4. Taking pulse and temperature of cattle.
 5. Drenching of cattle.
 6. Handling of cattle.
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16th April, 1926]

Agriculture Practical.

[6-30 A.M to 3 P.M.

1. Assemble and adjust Monsoon plough from parts provided.
 2. Yoke bullocks and take plough to field No. 37.
 3. Plough according to directions.
 4. Oral Examination.
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17th April 1926.]

Botany Practical.

[1 P. M. to 4 P. M.

1. Describe fully the specimen A and refer it to the Family mentioning other plants of economic importance of this family in the Presidency.
2. Write full morphological notes on B, C, D, E, F, and G.
3. Identify the slides H, I and J.
4. Make preparations of the specimen K. and indentify it,
5. Oral Examination.

19th April 1925.] *Chemistry Practical.* [Time 6 Hours.

1. Shake 100 grammes of given soil with 200 c. c. of given solution of phosphate for 15 minutes. Estimate the amount of phosphoric acid in suitable aliquots of the original solution and the filtrate. What inference would you draw about the retentive power of the soil?
2. Examine substance in the test tube qualitatively for not more than 2 bases and 2 acids.
3. Identify the organic substance in weighing bottle.

EDITORIAL NOTES.

M. A. S. U. Leads.

On a former occasion, we referred to the advent of the Royal Commission on agriculture in October next and put in a few suggestions on the basis of which readers of this Journal might collect and forward their views on this—the burning question of the hour. Now we feel dismayed at the apathy shown by responsible persons and the general public alike, in this matter. No action seems to have been taken except that the Viceroy called a conference of Ministers and Directors of Agriculture from several provinces. They met at Simla on the 4th June and discussed problems which from an official point of view ought to engage the attention of the Commission. This meeting has certainly cleared much obscurity in outstanding agricultural questions between the Central and Provincial Governments. Local agricultural committees have been constituted to co-ordinate proposals for placing the case of each province before the Commission. So far so good. But we are sure that both his Majesty's Commissioners and the Government of India would like and certainly expect and welcome people directly interested in the land and having considerable stake in it to come forward and express their views on land questions that have been agitating the minds of the public and the Government for a pretty long time. There is no denying the fact that Agriculture has been forced to the front in all countries especially after the war and India cannot stand alone with folded hands, looking at other nations to steal a march over her in developing natural resources.

The International Institute at Rome is making arrangements for an agricultural world census in 1930-31. Being in a position of vantage at present, enjoying the monopoly in Jute and oil seeds, India