

raiyat has been made transferable on payment of a fixed landlord's fee.

Thus we find that the tenants in Bengal—at any rate the great majority of them, comprising those who hold at fixed rates and those who have occupancy rights—have substantive interest in their holdings originating in many cases in the customs of the country and not by any act of, or contract with the landlords and now recognised and protected by the existing law of Landlord and Tenant in the land. The correct view of land rights in Bengal is that the several classes have divided ownership in land; they own separate and distinct interests in it. More than 40 years ago, Baden-Powell wrote: "The actual right of the landlord as it now exists, is an estate in the soil...limited by the rights of tenure-holders and raiyats.....and of course by the government's right to its revenue." This still remains the position today. Every holder in Bengal is of the nature of a firm of which the actual cultivator is the active and managing partner. He gives the landlord not the economic rent but, what is his due as a share in the profits of the transaction. And this is strictly regulated by law and the circumstances of each case.

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### The Dutch East Indies.

There are two distinct types of agriculture followed, the native and the estate. While the former is essentially bound up, except in the case of native rubber, with the production of an adequate food supply, the latter's chief object is the growing of crops for export. Both types of agriculture have been thoroughly organised and their prosperity is undoubtedly due to the efficiency and smooth running of private and Government research and educational schemes.

In no tropical country has it been possible to obtain a perfect connection between the plants and the research worker, and the methods employed for attaining this object are liable to considerable variations. Where a primitive system of agriculture is followed and where the plantocracy is illiterate, most of the investigational work is done by the Government. "In more advanced countries the tendency has been for work which relates to peasant crops to be carried out by the Government while that which is related to plantation crops is being placed more and more into the hands of special technical assistants who may be employed by the Government or by the planting community." In the still more advanced countries, estate interests and companies finance their own technical specialists and the Government are left mainly with the task of improving native agriculture. In this respect, the Dutch methods are especially advanced. For instance, the scope of their Agricultural Departments work in Java, is extremely wide. Forming part of what is known as the Department of Agriculture Commerce and Industry, it functions both as an experimental and administrative body. Its experimental section comprises a botanical garden, a general agricultural experiment station, veterinary and forest stations, and a phytopathological laboratory. The information gained by these experiment stations is distributed through their administrative services. Besides the Government Department are two other types of research organisations, of which one is devoted to research in special crops and is supported by syndicates of planters, and the other, which is

also devoted to scientific research is financed by individual companies. Amongst examples of the former there are the two Sugar Experiment Stations at Pasoereean and Cheribon, the Tea and Rubber Research Institutes at Buitenzorg and the Coffee Research Station at Malang in East Java. Among the latter may be mentioned the work of the research division of the staff of the Boenect Rubber Estate and the work of improving the yields of Oil palms and Hevea Rubber by the Societe Financiere Belge.

Pasoereean affords an interesting example of Dutch investigational methods. Entirely supported by private

sugar companies, the station is managed by a Director and a Board composed of the representative from the larger companies. The agricultural, engineering and chemical aspects of sugar production are studied in three separate divisions, the aim of the research work as a whole being to find optimal conditions in sugar production from the time the cane is in the soil to the time it is exported as sugar. Research is aided by the fact that sugarcane growing is confined to one district in the island and that as all cane is exclusively planted by the factory interests, experimental work can also be effectively controlled.

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**Growth of Seedlings in Light and in Darkness in  
Relation to Available Nitrogen and Carbon**

BY MARY E. REID.

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*General Summary* 1. Growth of the seedling is influenced by the nature and relative amounts of the food reserves of the seed, as well as by differences in the external environment such as light and darkness, and the presence and absence of nitrates in the nutrient solution. When the seedlings are grown without nitrogen from an outside source the following responses have been found: (a) Seeds having a high nitrogen and relatively low carbon content produce seedlings with a large top in proportion to the roots. (b) Seeds having a low nitrogen and high carbon content produce seedlings with a relatively small top in proportion to the size and weight of the roots. (c) Seeds intermediate in the proportions of their reserves of carbon and nitrogen produce seedlings with intermediate proportions of shoots to roots.