

data obtained, certain suggestions are made as to the lines upon which future investigation should be conducted, and it is suggested that a study should be made of the voltages produced by multiple-stroke flashes to transmission lines, and an attempt made to ascertain whether any relationship exists between voltage pulses and the predicted currents fluctuating in lightning return strokes. It is further suggested that these data could be got most efficaciously by combining photographic studies obtained by a Boys camera with simultaneous oscillographic records of the corresponding lightning surge voltages. Sudden fluctuations in the point discharge current magnitudes might easily be obtained by means of a cathode ray oscillograph, and synchronized records taken of the discharge current at two or more points situated on the storm track axis, and spaced about 3 miles apart. If the power lines should run at right angles to the storm, then the additional discharge points could advantageously be located along the line.

COMMON INDIAN GRASSES

AN interesting volume which was "written at the request of the Forest Department of the United Provinces, India, who wished to have a manual which would enable forest officers to recognize the common grasses found in their forests, taungyas and plantations" has a much wider appeal and deserves a place among the books of everyone interested in the Gramineæ. Its low price should help to give it the diffusion it deserves*.

The author points out that the grasslands of India are what Tansley would call a biotic climax, and only exist and are maintained when there is a harmony between the climatic and biotic factors so as to prevent the formation of forest. As a consequence, forest officers need to regulate the grazing and burning of the grasslands under their management with care, since too little of either is as harmful as too much.

After a summary of the ecology of the grasslands of the United Provinces, the author briefly discusses the morphology of the Gramineæ and gives short but precise instructions for making detailed examinations of specimens. Two keys are included, the first being an artificial one dealing mainly with larger and more obvious characters and intended for the less specialized user. The second is based on C. E. Hubbard, and contains keys to all the genera and species with which the book deals, except that no key is included to the genera of the Maydeæ (possibly by an oversight) so that the user is not given a clue to the position of *Chionachne* and *Coix*. The author might have been bold and included them in the *Andropogoneæ*, since they are, as Bews says, little more than a sub-tribe of the former.

The rest of the work consists of descriptions of the species common to the United Provinces arranged alphabetically under the genera, each species having two descriptions, one of a more 'popular' type and the other of a more detailed technical character. The known and possible economic uses of each species are briefly mentioned. The ninety-two commonest grasses are described and the work is illustrated with sixty-four plates, most of the species being illustrated either by photographs of living

plants or full-page drawings which show clearly their habit and more essential features, a task which is not at all easy with the grasses. The illustrations of *Saccharum* are especially good, though in some of the other genera a few more detailed illustrations of spikelet dissections would have been welcomed.

A number of small points detract from the work. Phraseology of the type "a feature which is made use of in separating these species", "The nodes are easily made out", "anker roots" (all on p. 19) and "Many species of the *Andropogoneæ* are collections of spike-like branches" (p. 20) tend to jar the reader. Again, the use of the word *Gramineæ* without its capital initial, twice in the introduction and occasionally elsewhere is not acceptable, especially as the author has no good reason for this and restores its capital later in the work. A number of plates have the bottom half an inch folded up as they are too large for the volume. This could have been avoided in most cases by a more careful placing of the figures, or even the titles.

However, these are only small defects: the book will be useful to anyone concerned with grasses and will provide good illustrations and descriptions of a number of most interesting tropical grasses not adequately treated in most text-books.

B. C. SHARMAN.

THE POTATO IN INDIA

THE potato (*Solanum tuberosum*) is cultivated in India in the plains as well as in the hills. In the plains it is difficult to store the crop through the hot season. Hence seed in the plains comes from the hills or is imported. It is also difficult to hold potatoes in the plains in storage for table purposes owing to shrivelling, moth attack, wet and dry rots, high-temperature rot and sprouting. Potatoes after lifting will not sprout during a dormant period varying with temperature, variety and maturity at harvest.

Dr. D. V. Karmarkar and Mr. B. M. Joshi began experiments on the cold storage of the Indian potato in 1936, and their results are now published in *Miscellaneous Bulletin No. 45 of the Imperial Council of Agricultural Research*. The work was done under the Council's cold storage research scheme at Ganeshkhind Fruit Experimental Station, Kirkee. Below 35° F. dormancy was indefinitely prolonged. At 40° F. the maximum period of dormancy observed was nine months. Delay in placing potatoes at this temperature after harvest reduced the period of dormancy. There was no wastage at 40° F. or 35° F., but at lower temperatures, 30° and 32° F., the potatoes were injured after three months exposure. The injury was a blackening of the central tissues (black-heart).

The sprouting vigour of potatoes was not affected by extending the dormant period at 35° or 40° F. The growth and yield of crops grown from seed long stored at these temperatures may even be favourably affected. Black-hearted potatoes merely rot when used as seed.

This report, of which the main results are quoted above, is a sound piece of systematic scientific survey work of permanent value. It provides bed-rock data for agriculture and industry under Indian conditions, such as can only be acquired by years of organized effort. It is to be hoped that work of this character will be continued and extended.

FRANKLIN KIDD.

*Common Grasses of the United Provinces. By N. L. Bor. (*Indian For. Rec.*, New Series. Botany. 2, No. 1.) Pp. vii+222+64 plates. (Delhi: Manager of Publications, 1941.) 9.14 rupees; 15s. 6d. net.