

## Agricultural Meteorology in India

THE progress of agricultural meteorology in India is outlined in the latest annual report of the Agricultural Meteorology Branch of the India Meteorological Department, which covers the third year of that branch, ending Aug. 21, 1935. In the Experimental Section, a diagram is shown in which is plotted for three different levels the march of temperature throughout the 24 hours in the stem of sugarcane and in the air at the same levels, the observations having been made in a small plot of sugarcane at Poona with the aid of a portable thermo-couple set specially designed for obtaining plant temperatures. This set was described in the previous year's report. It is seen that the sugarcane is cooler than the air during the day, but warmer at night. Further work on portable percolation gauges and evaporimeters is described in the same section.

Another interesting diagram relates to the microclimates of growing crops. Graphs are shown of the variation of dry bulb temperature and of vapour pressure at various heights up to 6 feet within the crops and in the open air during the hottest part of a typical fine afternoon in October, that is, in the clear season. The observed differences are greatest at the level of the ground, and in the case of the vapour pressure become small at a height of 6 feet. A large amount of experimental work was also done on the behaviour of various soils with respect to evaporation during the day and absorption during

the night. It was found that the black cotton soils have the greatest diurnal variation of moisture content and the alluvial soils the least.

Radiation received a large share of attention, especially the nocturnal radiation from the surface of the earth and its relationship with the water content of the atmosphere. It is claimed that this study of the exchanges of radiation between the ground and various layers of the atmosphere explained why the temperature was found to decrease with height in the first few centimetres above the ground and then to increase.

In addition to these nocturnal studies, measurements were made with a pyrheliometer at Poona at fixed times on clear days, and every hour on representative days during each month, of the intensity of direct solar radiation and the distribution of energy in different parts of the spectrum; a self-registering Moll solarigraph was also maintained in action during a large part of the year. Another solarigraph was set up at Shahjahanpur, and it is intended to install a third at Lyallpur, with the view of discussing eventually the seasonal variation of the total radiation of sun and sky in different parts of India.

A striking feature of the work in nearly all the branches of agricultural meteorology described in this report has been the amount carried out voluntarily by research students, some of whom were working for the M.Sc. degree.

## Game Sanctuaries or National Parks

THE subject of the preservation of the wild fauna of the world, especially in those parts where for a variety of reasons there exists grave danger that interesting species may under the actions of man be exterminated, has been before the public on several occasions lately. The well-known national parks in the United States and Canada are often quoted as examples to be followed elsewhere. It is true that on a far smaller scale both national park and fauna (and flora) sanctuaries can be formed—even in the small island of Great Britain; and evidence shows that steps are being taken to give effect to so desirable an object.

It appears to be a curious fact that in the British Empire such suggestions have met with little response until lately, either in Asia or Africa. That position is now also being rectified in some degree. In India the subject of fauna preserves has been ventilated for a number of years. In fact, fauna sanctuaries have been in existence since early in the present century.

The commencement was made in Assam, for the protection of rhinoceros, bison, buffalo and elephant; though the latter has been under protective laws in British India for decades. About 1908-10 a fauna sanctuary was formed, under the auspices of Sir John Hewett, Lieutenant-Governor of the United Provinces, in the great sal forests at the foot of the

Himalaya in these provinces. At the time there was a considerable divergence of opinion as to whether the sanctuary should be permanent or only for so many years, after which it would be opened to shooting and another area closed.

As a result of these early attempts and the more modern ideas attached to a national park which have been given ventilation in the Press of late years, in the spring of 1934 Lord Hailey, at the time Governor of the United Provinces, suggested that the Forest Department should make proposals for the creation of a game sanctuary or national park on the lines recommended by the International Conference of 1933, that is, a national park to be created by legislative authority. The account of this departure, and the formation of the Park to which the name of the Governor, Lord Hailey, was given, is detailed by E. A. Smythies ("The Hailey National Park". *Indian Forester*, 2, 467). The area selected for the park is in the famous and beautiful Patli Dun and the hill forests to the south of it in the Ramganga Valley, situated at the foot of and in the foothills of the Himalaya somewhat to the east of the River Ganges. The total area selected is about 125 square miles.

A Bill, the first of its type in India, was drafted. The United Provinces National Parks Act, 1935, was finally passed by the Legislative Council and