

ance of flower colour in *Mirabilis jalapa* (belle-de-nuit) were illustrated by Glyn Grammar School, Cheam. Work in the kitchen was demonstrated by a keen mycophagist, who had prepared a range of dishes from locally collected specimens. No one was invited to, and no one attempted to, taste the delicacies.

As usual, there were supporting exhibits of specimens, charts, publications and photographs by guest contributors. This year the guests were the Amateur Entomologists' Association, the Botanical Society of the British Isles, the British Naturalists' Association, the Children's Centre of the British Museum (Natural History), the International Union for the Conservation of Nature, the Nature Conservancy and the Universities Federation for Animal Welfare.

O. N. BISHOP

DEW

WHETHER dew rises or falls has long been disputed: observations, recently described by Dr. J. L. Monteith (*Quart. J. Roy. Meteor. Soc.*, **83**, 322; 1957) have now been made which show that it can form in either way depending, roughly, on whether the air is calm or not.

The amount of dew formed on various kinds of surface has been measured by numerous workers. The difference in Dr. Monteith's work is that he measured the evaporation from, and condensation on, a block of turf-covered soil by continuous weighing. The formation of dew on turf adjacent to the block was observed by lightly brushing it with the back of the hand, and the weight of dew, when it was sufficient for measurement, was obtained by absorbing it on filter paper and weighing immediately against dry paper.

In the day the grass remained dry and the balance showed a loss of weight owing to evaporation. If temperature fell rapidly after dark the balance showed a continuing loss of weight for about an hour, even though moisture was visibly forming on the grass. Two states were found to occur during nights in which a measurable amount of water condensed on the grass: (a) one in which the rate of increase of weight of the block of soil was at least an order of magnitude less than the weight of condensed water; and (b) one in which the increase in weight of the soil was of the same order of magnitude as the weight of condensed water on the grass.

The first state, in which the downward transfer of water vapour from the air above must have been very small and the water evaporating from the soil all condensed on the leaves, was associated with a wind of less than 0.5 m./sec. at 2 m. above the ground. The second state was associated with slightly stronger winds, the weight of condensed water reaching a maximum with a wind of 2-3 m./sec. at the 2 m. level. With stronger winds, dew formation became less because cooling of the grass was reduced by the heat transferred downwards by turbulence being more nearly equal to the rate of loss of heat by radiation. The first state is termed by Monteith 'distillation' and the second 'dewfall'. The rates of condensation varied in each type according to circumstances, but were of the same order of magnitude, ranging from 0.6 to 2.7 mgm. cm.⁻² hr.⁻¹. The air within the grass-cover remained unsaturated during these states, with relative humidities of the order of 91-95 per cent. The leaves were about 1° C. colder than the

surrounding air. If the air in the grass-cover became saturated, fog always formed. The maximum amount of dewfall measured during a night was 12 mgm. cm.⁻², and it is estimated that there are only some twenty nights a year at any one place in Britain at which it reaches 10 mgm. cm.⁻² and that the annual amount does not exceed 1/5 in. In warmer climates dewfall can be greater.

The paper gives a quantitative study of the whole phenomenon, including the temperature, humidity, and variations in surface-heat balance. The variations in heat-balance confirm that the condensation of moisture on the grass on very calm nights represents a transfer of latent heat from soil to grass and not from the air to the grass.

LONG ASHTON RESEARCH STATION

REPORT FOR 1956

THE annual report of the Agricultural and Horticultural Research Station for 1956 (pp. 180 + 11 plates. University of Bristol, 1957) summarizes another year of steady progress in research. The Pomology and Plant Breeding Section records that three families of blackcurrant seedlings raised in 1947, with the object of producing late-maturing varieties with high ascorbic acid content, fruited for the first time in 1956. Some had ascorbic acid contents of 250 mgm./100 gm. The blackcurrant breeding programme has been enriched by further additions of *Ribes* species, which now number more than one hundred. Research on the application of growth substances to fruit thinning has been continued. Striking differences in growth and leaf nutrient status of young apple trees were found in the cover-crop trial. Compared with clean cultivation, the cover-crop markedly depressed tree vigour and leaf-nitrogen status. Satisfactory seasonal control of lime-induced chlorosis of pears was obtained by sub-soil injection of 20 gm. iron per tree as iron-hydroxyethylethylenediaminetriacetic acid, or by foliar sprays of this chelate at 0.1 per cent concentration. Preliminary experiments were also made with some new iron chelates. The Entomology Section has continued investigations into the study of the fundamental effects produced by the incorporation of surface-active agents as spray supplements and the results indicate that phytotoxicity varies considerably with both the chemical structure of the wetting agent and the nature of the leaf surface. The most important factor appears to be the complex formed between the surface-active ions and the long carbon-chain alcohols present in leaf waxes. The development of spray machinery has continued with special reference to the requirements of certain tropical crops. A new list of cider apple varieties recommended for planting has been prepared jointly by the National Agricultural Advisory Service and the Station Orchard Committee and is printed in the report. This list, which supersedes that published in 1948, is divided into varieties which are recommended and those which may be useful for special purposes. The latter group includes varieties which have some disadvantages but also some outstanding qualities. Suitable pollinators are also listed which will be of assistance in planning new orchards by modern methods.