

## SCIENCE IN UNITED STATES UNIVERSITIES

A SURVEY of scientific research activities at colleges and universities in the United States, published by the National Science Foundation as No. 6 of "The Reviews of Data on Research and Development", gives the number of scientists and engineers employed in the natural and social sciences during the academic year 1953-54 as 70,000.

Detailed information was obtained from 180 out of 190 institutions constituting almost all the schools granting advanced degrees in science, and more limited information was obtained from 807 out of the remaining 930 schools. The returns covered 62,251 or 90 per cent of the total, and of these 31,435 were engaged in research, 8,262 being full-time, the total full-time equivalent being estimated as 16,534. Of these latter, 5,481 were engaged in research (2,281 in engineering sciences, 1,077 in chemistry, 837 in physics), 3,508 in biological sciences, 2,171 in chemical sciences, 3,658 in agricultural sciences, 389 in psychology, and 1,327 in social sciences.

The 180 larger institutions reported 24,000 supporting personnel, corresponding to a full-time equivalent of 15,060, giving a ratio of approximately 1:1. Of the 46,500 faculty members in the natural and social sciences at the 180 larger institutions, about 37,500 were employed full-time, and two-thirds of all the faculties spent some time on research, representing two-fifths of the total faculty-time, whereas in 807 small institutions less than 2 per cent of faculty-time was devoted to research, less than 10 per cent, or 16,000, employed being engaged in research.

Nearly 1,500 professional schools were reported by the 987 institutions, of which 764 were in arts and sciences, 131 engineering, 106 health, 71 agriculture, 217 research organizations (mainly responsible for a particular field of research) and 263 other professional schools. Two-thirds of the institutions were private and the remaining public-controlled institutions employed 56 per cent of the total engaged in the natural and social sciences, 61 per cent of which were engaged in research.

## STARLING ROOSTS

A FASCINATING account of the way in which starlings roost and the sites they choose has been given by H. A. S. Key in the *Bedfordshire Naturalist* (11; 1957). Starlings are abundant in Bedfordshire, and the many resident birds are considerably augmented during the winter months by many thousands of others which arrive chiefly from Scandinavia. At night the birds congregate in communal roosts which are usually sited in thorny copses and spinneys. In general, once a roost has reached an optimum condition of growth and non-disturbance, it is used for many seasons. At each roost the pattern of assembly is much the same. The birds fly at first in leisurely stages towards the roost, but as the daylight fades and they get nearer to the point of assembly, their flights are more direct and flocks tend to converge and amalgamate.

The point of assembly is close to the roosts and often on the ground, where the birds form a dark carpet and the noise of their whistling and chattering is considerable. Then, suddenly, they get up, often indulging in some preliminary aerobatics, first in

extended and then in close formation, before the entire party moves in a steady stream into the roost proper. Here with a great deal of commotion they wheel around and settle on the trees. For a short period there may be changes of perching areas within the roosting wood, but finally, when it is almost dark, the whole mass of birds is assembled in the regularly used part and then as each stem becomes packed with the jostling mass the din reaches its crescendo. From this tight grouping they are then not easily disturbed and sharp noises such as hand-clapping usually only suffice to cause the nearest group to move a few yards away.

In north Bedfordshire it would appear that the majority of the birds frequent one or other of two very large roosts, the populations of which would be hard to determine. These are Horn Wood, near Bozeat, Northants, just outside the west boundary of the county, and another site near Everton in the east. There was some years ago a smaller roost in Keysoe Park Wood, but this seems to have been abandoned.

## THE NATIONAL TRUST

## ANNUAL REPORT, 1956-57

THE sixty-second annual report of the National Trust, for 1956-57, makes slight reference to the threats offered to its primary duty of ensuring the safety of fine open country or fine buildings which arise from Government departments or other public authorities. Some evidence is recorded of increasing public appreciation: in 1956 nearly 900,000 visitors paid for admission to those properties where an entrance fee is charged, an increase of more than

200,000 on 1955, and membership increased by more than 5,500 to 61,713, with a further increase of 3,740 during the first seven months of 1957.

Nevertheless, the Council's hope that the 100,000-mark will be reached in 1959 seems modest indeed and far too low, either to relieve the Council of continuing financial anxiety (in spite of a small surplus in 1956, when membership income increased by £17,000) or to ensure the widespread public

understanding and support necessary to avert the increasing destruction and vulgarization of the countryside, country towns and villages. While the position of the country house to-day seems slightly less gloomy and in archaeology a considerable sum has been spent in the past eighteen months on the preservation of the Cerne Giant in Dorset, repairs have been commenced to the Roman ruins at Ribchester, and satisfactory progress is reported in repairs to the Roman wall at Hotbanks, the report expresses the opinion that the face of England is rapidly changing for the worse.

Cafés, petrol stations, advertisements, neon lights, concrete lamp-standards, ill-sited and ill-designed, are everywhere, and persistent irresponsibility is shown

in siting high-power cables, nuclear power stations and radar installations. The Trust has protested more than once during the past year against such ill-considered siting, but although this desecration is viewed with anxiety and regret the Council believes that a change of faith in official quarters and the establishment of a new canon of taste could, even now, save the situation and repair much damage already done. The Council appeals to members for active support in its practical proposals for dealing with the development of the English landscape, and in particular the report urges the importance of reducing signposts to the essential minimum and for far more thought in their design and siting.

## GROWTH AND REPRODUCTION IN WORM-FREE SHEEP AT PASTURE

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**N**EMATODES parasitic in the alimentary tract have been shown to cause a depression of the growth-rate of lambs maintained indoors<sup>1,2</sup> even when the level of infestation has been sub-clinical. This has been confirmed for lambs at pasture<sup>3</sup>, and it has been found possible to raise lambs free from stomach and intestinal worms (with the exception of *Strongyloides papillosus*) by rapid folding over clean pasture<sup>4</sup>.

Thirteen Suffolk × half-bred ewe lambs reared with their infected ewes in this way in the spring of 1956 were weaned on to 6 acres of worm-free pasture (that is, one not grazed by ruminants for at least two years) in June of that year. They remained on this area, for the most part set-stocked, until April 1957, with the exception of three weeks (Oct. 29–Nov. 23, 1956) when they were brought indoors to be tupped. This procedure was necessitated by the absence of a worm-free ram. At the same time, 15 of the best remaining ewe lambs from the farm flock were selected for comparison. The previous live-weight history of these two groups is shown in Fig. 1. The decline in live-weight gain of the infected ewe lambs (Group I) during the autumn was characteristic of sheep of that age on the farm and occurred in spite of grazing a better pasture than that available to the worm-free lambs (Group F). Thus, at tupping time, Group F lambs were, on average, 17 lb. per head heavier than those in Group I. The latter were maintained throughout the tupping period on a nearby field, and the same ram was employed for both groups, spending the day in the field and being brought in to Group F at night.

On November 23 Group F was returned to its field, and Group I was grazed on a comparable, and at no time inferior, sward. Fig. 1 shows the subsequent mean live-weight changes for both groups of sheep. From January 16, 1957, concentrates (80 per cent cereal, 15 per cent dried lucerne meal, 5 per cent linseed cake) were fed to both groups at the rate of  $\frac{1}{2}$  lb./head/day, rising gradually to 1 lb./head/day on February 25 and continuing at that rate until April 24. A mineral mixture rich in magnesium was included to prevent hypomagnesaemia.

The egg counts for each group are shown in Fig. 2. The egg-count curve for Group I was typical of sheep of that age at that time, but rather low. Group F faeces were negative for parasite eggs until the sheep were brought inside for tupping, when a mean count of 2 eggs per gm. was recorded. This declined to

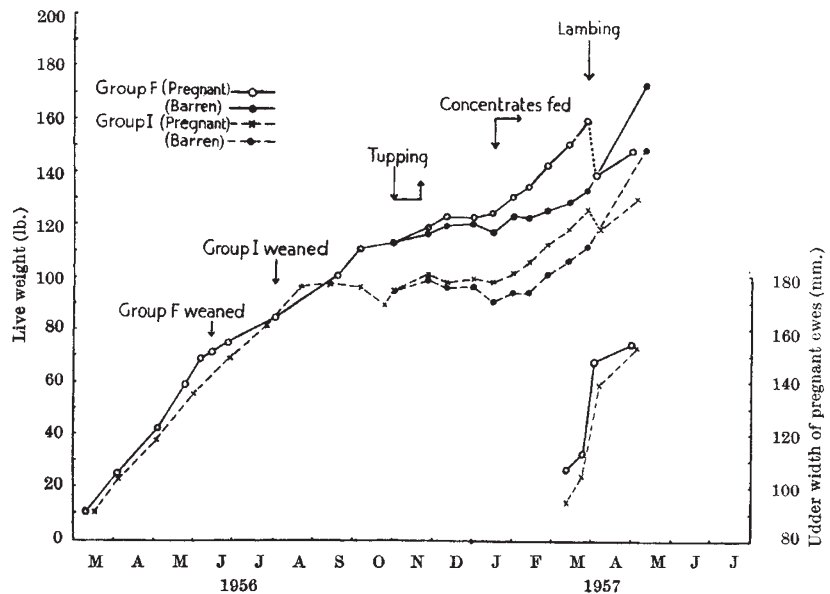


Fig. 1. Mean live weights and udder measurements of Groups I and F