Much still remains to be done in at least three directions: (*a*) provision for field-work other than marine (or freshwater) biology and ornithology; (*b*) ensuring effective linkages between the various branches; and (*c*) provision for the guidance and reception of the individual inexpert but potentially serious student.

Flatford Mill, where Dr. Ennion took his first students in May 1946, and the three other centres of the Council for the Promotion of Field Studies—Dale Fort, Juniper Hall and Malham Tarn—go part of the way towards filling these deficiencies. Each accepts between forty and fifty students a week from March to October (and a few in the winter) from universities, training colleges and schools all over Britain, together with a "fair leavening of independent naturalists and artists". Each is staffed by a warden and his assistant, who cover all branches between them, the warden also being responsible for the entire organisation of his centre—an exacting post but a very much alive and worthwhile one.

A thousand university students and five hundred older independent visitors come to these field centres in the course of the year, which leaves about four thousand vacancies, distributed between the four centres, for teachers, training-college students and sixth-form boys and girls, whose previous experience of field-work is very limited. Almost all of them need the full-time co-operation of the warden and his assistant. So there is very little chance of adequate help for the occasional student—"the one in every twenty-five or so who takes to field-work like a duck to water"—who would obviously respond keenly to individual attention.

But these occasional individuals are of prime importance: they are the amateur naturalists of the future. Dr. Ennion is leaving his post at Flatford Mill to establish a new station, the Farne Naturalists Trust, where it will be possible to welcome these students individually. Monks' House, south of Bamburgh and opposite the Farne Islands on the Northumberland coast, has been secured for this purpose. It is designed expressly for the amateur naturalist, more particularly perhaps for the ornithologist, although workers in many other branches will find ample opportunity and a ready welcome. Monks' House opens next Easter, and details will be available shortly for those who are interested in this new development.

NEW ZEALAND EARTHQUAKES DURING 1947–48 AND JULY–DECEMBER 1949

R. C. HAYES has examined and catalogued all earthquakes in New Zealand during 1947[1] and also 1948[2]. In 1947 the earthquakes of June 16, from lat. 38·4° S., long. 178·4° E., and of October 13, lat. 44·2° S., long. 169·0° E., attained intensity 7 on the Modified Mercalli scale, and six earthquakes attained intensity 6. The sea area between the two islands and its environs, and North Island east and north-east of the River Wanganui, had the majority of the epicentres. There were concentrations of epicentres to seaward off Gisborne, and in the Southern Alps west of Christchurch and north-east of Mount Aspiring; also a small group to seaward in the extreme south off Puysegur Point. Otherwise, throughout the year, there were very few earthquakes elsewhere.

In 1948, 127 earthquakes were reported as felt during the year. The largest disturbance occurred on May 23 in the Hanmer–Waiau region, when intensity 8 on the Modified Mercalli scale was reached. Some buildings in the epicentral region suffered structural damage, and minor activity continued at intervals for some months. Other strong shocks occurred on January 15 off the Manawatu coast, on June 19 off the west coast of the South Island, and in July in the Monowai region; the first two of these were widely felt.

Provisional seismological bulletins for July–December 1949 have been received from the Dominion Observatory, Wellington. They include readings from nine observatories, including Suva, Fiji, and a new station, Cobb, established on July 20, 1949, in lat. 41° 5′ S., long. 172° 44′ E., and equipped with a Wood–Anderson short-period seismograph east–west component. During the period 114 strong distant earthquakes were recorded, and 129 local shocks felt. Of shocks with instrumental magnitude 5 or greater which were felt, three were experienced in Opotiki, three in Tolaga Bay, one each in Wairoa and New Plymouth and several in Wellington.

[1] New Zealand Seismological Observatory Bulletin *S*-90 (1949).
[2] *ibid.*, *R*-34 (1949).

STANDARDS FOR TELEVISION SYSTEMS

ONE of the study groups of the International Consultative Committee on Radiocommunication (C.C.I.R.) has recently been exploring the possibility of obtaining international agreement on the standardization of some of the various technical factors which define the characteristics of a television system. A preliminary meeting was held at Zurich in July 1949, at which it was decided that, before meeting again in London in 1950, the study group should inspect the practice and present state of development of the existing television services in America and Europe (see *Nature*, **164**, 477; 1949).

This inspection was carried out by representatives of some sixteen national administrations and operating organisations, and started with a visit to the United States in March and April of this year. The programme comprised a series of visits in New York, Philadelphia and Washington, D.C., for the purpose of witnessing the present-day operation of the television services available in the eastern portion of the United States, the development and production of various types of television equipment, and particularly of observing demonstrations specially arranged to assist the study group in its work on standards for television. This was followed by visits to Paris and Eindhoven, where the arrangements and demonstrations were organised by the Radiodiffusion et Télévision Françaises and the N. V. Philips Gloeilampenfabrieken, respectively. Finally, in Great Britain the delegates visited various stations and establishments of the British Broadcasting Corporation and the General Post Office, and industrial laboratories and factories. In all cases, the visits and demonstrations were designed to show the present state of television development and the different aspects of the varied and detailed work which is necessary for the establishment and maintenance of a public television service.

This tour was followed by a meeting of the study group in London during May 8–12, at which the various aspects of television standardization were discussed with the view of facilitating the interchange of programmes between countries and of reducing to a minimum the possibility of interference between television transmissions in adjacent countries. It was concluded at this meeting that, while it would have been most desirable to achieve standardization on a world-wide basis on all the various characteristics which define a television system, this appears to be impossible because of the existence of public television services using different standards in several countries in which large numbers of receivers are already in the hands of the public. There was, however, unanimous agreement on the following points, which were recommended for approval by the next plenary assembly of the International Consultative Committee on Radiocommunication: (1) television systems should be capable of operating independently of the frequency of the power supply; (2) the aspect ratio of the picture should be 4 : 3; (3) line interlacing should be used in the ratio 2 : 1; (4) asymmetric side-band transmission should be adopted for the vision signal; and (5) there is no necessity to standardize the polarization of the radio transmission.

In addition to the above, the characteristics of the 405-, 525-, 625- and 819-line systems were examined in some detail; and, for the reasons already stated, the representatives of France, the United Kingdom and the United States confirmed the continued use of their present standards. The French and United Kingdom delegates maintained their previous proposal, made at Zurich, to consider the unification of the standards of the London and Paris television transmitters. At the same time, the representatives of Austria, Belgium, Denmark, Italy, the Netherlands, Sweden and Switzerland declared themselves in favour of the 625-line system, and addressed an appeal to their colleagues to reconsider the position. The meeting concluded by directing attention to a number of technical problems that need further study in connexion with the general subject of television standardization.

ZOOLOGY IN RELATION TO AGRICULTURE*

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ZOOLOGY *in sensu stricto* is the science of animal-life; agricultural zoology deals with the application of zoological knowledge to the practice of farming. The prospective adviser or research worker in agricultural zoology must, therefore, have a comprehensive knowledge of the vast terrestrial fauna, and must also be sufficiently informed about agriculture to assess the potentialities of zoological discoveries in relation to farming practice. Reasoned conjecture is part of the stock-in-trade of the academic biologist (and is usually harmless); but the agricultural biologist must be more circumspect. As with other applied sciences, agricultural zoology is based on a tripod of supporting struts—education, research, and its application—and, from the teaching point of view, one should steer a course between pure academics and sheer utilitarianism.

Few people cannot be aroused to enthusiasm over some aspect of animal life, and the countryside abounds in a wealth of teaching material. In the past, there has been a tendency to lay undue emphasis on structural details, at the expense of the ecological approach to zoology; although for all but the specialist student the ecology of animals has usually a greater appeal, and is certainly of great value in linking up with other subjects. This implies greater attention to the study of animals as a product of their environment—the effects of climatic and edaphic factors, the significance of natural enemies and other natural factors of population control, the causes of animal plagues, and so on. Apart from the educational value of zoology there is an urgent need of obtaining a deeper insight into the role of animals in the economy of Nature, because of sheer economic necessity.

In Britain to-day, there are six million more people and three million fewer acres of good farmland than there were in 1914; which means that there is only about half an acre of productive land per person. Now, every piece of land has a series of practical ceilings of productivity which can be raised by reducing the effectiveness of limiting factors, such as herbage-eating rodents, beasts and birds of prey, plant-feeding insects, disease-carrying ticks, and parasitic worms of stock and crop. Since there are no large areas of land awaiting easy exploitation, an alternative means of alleviating the food situation is the intensification of production; but all forms of intensive culture favour the multiplication of pests and insect-borne diseases, as seen in the abundance of orchard, vegetable and glasshouse pests: eelworms of potato, beet and oats, and virus diseases of plants.

Through the operation of numerous 'checks and balances', plants, plant-feeders, and their natural enemies exist in a state of fluctuating equilibrium—the balance of Nature—until man starts to cultivate the soil or heavily stocks the ground. Thereafter, the complex relationships which contribute to the balance are ruptured in varying degrees, with resultant increase of some species and reduction of others. Heavy stocking favours the spread of disease-causing parasites. Bare fallowing reduces the soil population, whereas continuous monoculture favours a dense and specialized fauna. Between these extremes, different rotations favour different pests; but, in general, the farmer has a powerful weapon for pest-control in the judicious choice of rotations.

In view of the causal relationships between pest-densities (population) and environmental conditions, the agricultural zoologist has a splendid opportunity of linking science with practice, and of simultaneously expounding many highly relevant biological themes, for example, the struggle for existence and the survival of the fittest, the reproductive potential of animals and the toll of the environment, predator-prey relationships, adaptive modifications of structure and function, hazards of the parasitic mode of life, etc. Surviving species have adjusted themselves, in the course of time, to their environment (including competition among themselves) and have become the warp and woof of an intricate pattern. Hence, to assess the true role of a species in the economy of Nature is an exacting task, requiring a fundamental knowledge of ecology in general.

* Substance of an address to a Conference on the Land and the School, arranged by the Association of Agriculture in conjunction with the University of Glasgow and the West of Scotland Agricultural College, July 11–14.