

Equations with Variable Coefficients", published in *The Aeronautical Quarterly*; *The Herbert Ackroyd Stuart Memorial Prize* to Dr. R. R. Jamison, assistant chief engineer in charge of ram jets at the Bristol Aero-Engine Company, Ltd., for his paper on ram-jets; *The J. E. Hodgson Prize* to Prof. H. J. van der Maas, professor of aeronautical science in the University of Delft, for his paper on aeronautical research in the Netherlands; *The Branch Prize* for 1958 has been awarded for the Roy Chadwick Memorial Lecture, read before the Manchester Branch in May 1957 by Mr. M. B. Morgan, one of the two deputy directors of the Royal Aircraft Establishment, Farnborough, on "Some Thoughts on Aeronautical Research and Design"; *The Navigation Prize* to Mr.

W. Makinson and Mr. G. M. Hellings for their paper on synthetic aids to flying training (Mr. Makinson is managing director and Mr. Hellings is chief engineer of Air Trainers Link, Ltd.); *The Usborne Memorial Prize* to Mr. D. G. Drake, lecturer in the Department of Aeronautical Engineering at the University of Southampton, for his paper, "The Oscillating Two-Dimensional Aerofoil between Porous Walls", published in *The Aeronautical Quarterly*. Sir Arnold Hall, director of the Hawker-Siddeley Group, took office as president of the Royal Aeronautical Society at the conclusion of its annual general meeting on May 8, in succession to Sir George Edwards, managing director of Vickers-Armstrongs (Aircraft), Ltd.

THE NATURE CONSERVANCY

THE eighth annual report of the Nature Conservancy* covers the year ended September 30, 1957; and the shift in emphasis in the work of the Conservancy towards the execution of its research programme, the application of ecological and other acquired or currently emerging knowledge and the improvement of its educational and other advisory services noted in the previous report was maintained. The year's experience gives further point to the hope expressed in the concluding words of that report that the Conservancy's findings would demonstrate that, where the land is concerned, long views are sound views. The need for the Conservancy has been repeatedly demonstrated during the year, and effective backing has still to be won for a comprehensive long-term approach in which, in the light of expanding scientific knowledge, the conservation of the natural resources of plant and animal life in Britain can be blended with tradition and with economic and other national considerations in policies of land use and land management. The Nature Conservancy has sometimes been pressed to fall in with particular current attitudes and practices which it has reason to believe to be unsound, and it should be assured of the support of all scientists in refusing to trim its scientific findings and management plans to satisfy sectional and opportunist views. As the report rightly concludes, conservation is for all time, and should not be continually subordinated to issues of expediency which hold only for a decade or two or even less.

The report shows that there are need and opportunity for much more clearly expressed support of the work of the Conservancy by scientists in general, and by all those who care for the ideas which the Conservancy represents. Close liaison with the Central Electricity Authority has enabled the Conservancy to avert several collisions, and the nuclear power programme has gone ahead without delay, and so far with a minimum of damage to the fauna and flora and to important geographical features; although the pace of current development of agriculture, forests, highways, airfields, defence installations, nuclear power stations, extraction of minerals, oil refineries and pipelines has necessitated many hasty decisions involving irreversible consequences

for the land and its natural resources of soil, water and animal and plant life. The liaison established on St. Kilda has minimized and not eliminated damage from developments necessitated by the Hebridean Guided Missiles project and no more can be claimed or expected from the consultations over developments at Milford Haven.

It is the more urgent and important accordingly to accelerate the basic and applied research programmes, the result of which may determine the choice between wise decisions giving satisfactory long-term results, and ill-judged decisions which our descendants, if not ourselves, may have cause to regret. While the grant-in-aid for the current financial year (1957-58) has again been increased, practically all this £30,000 will be absorbed by the effects of inflation, and the resources devoted to research are not yet in any way commensurate with their importance or with the scale of economic and other losses which may result from continuing to settle such matters largely in the dark. Of the total grant-in-aid for 1956-57 of £280,000, £54,000 was in respect of capital expenditure, and the Conservancy is still unable to meet adequately the expenditure needed for the proper maintenance and management of nature reserves or to make new research grants, although six were extended and ten postgraduate research studentships awarded and sixteen continued.

Besides this, the Conservancy urges that there is still too little appreciation of the damage being done, even to the national nature reserves, by visitors who ignore the importance of safeguarding the bare minimum of strongholds in which the hard-pressed fauna and flora can survive as a permanent part of the national heritage. The need for undisturbed experimental areas where the scientific programme can be carried out without interruption or disturbance is even less widely recognized. Further, there is no national body of citizens who recognize their responsibility to guide, stimulate and educate opinion on the importance of nature reserves.

During 1956-57, the acreage of national nature reserves rose by the acquisition of nine new reserves from 82,662 to 121,825, including the Hebridean islands of Rhum and St. Kilda. Encouraging progress was made by the newly organized Conservation Branch in preparing detailed management plans for nature reserves and in reorganizing the warden

* Report of the Nature Conservancy for the year ended 30th September 1957. Pp. v+99+13 plates. (London: H.M. Stationery Office, 1957.) 5s. net.

service; a new grade of warden/naturalist has been created to reinforce the scientists at headquarters or research stations by trained men permanently in the field. The Conservation Branch is also adding systematic research in applied ecology and reserve management under the regional officers to the existing research programme in ecology and physiography, thus assisting research workers to share the stimulus and responsibility of solving actual land management problems.

The section describing scientific research carried out by the Conservancy now occupies 18 pages out of the 78 pages of the report, together with a 3-page list of sixty scientific publications, while the account of the scientific advisory services occupies a further 14 pages. Investigations of moorland fauna at the Moor House Nature Reserve continued, and a study of methods available for the quantitative estimation of enchytraeid worms indicates that this group plays an important part in the biological turnover of moorland soils. Research work in the Snowdonia area on the influence of local variations in climate on the development and properties of its soils and vegetation, the contemporary productivity and the patterns and process of human settlement, is confirming that the macro-nutrient content of soils at high rainfalls is markedly less than at rainfalls below 100 in. mean annual, but the tendency to develop podsollic profiles is not great. Contrary to expectation, it appears that soils which are developed at rainfalls greater than 150 in. have a lower organic matter content than those developed at rainfalls less than 100 in. mean annual. Preliminary work on the micro- or trace-element content of Snowdonian soils indicates that soils derived from acidic rhyolitic rocks contain much less cobalt than those derived from basic volcanic ashes and dolerites. The weekly study of a chain of sixty-five plots across Snowdonia revealed a marked variation in selectivity of sheep grazing determined by season and weather.

A procedure by which direct sowing methods may possibly be used in place of planting as a means of regenerating native pine stands has been worked out at Beinn Eighe, and the initial phase of the investigation into methods of tree and shrub establishment by direct sowing has been completed. Research on the germination and survival of oak seedlings at the woodland nature reserves of Roudsea and Yarnier continued, and at the former small mammals seem to be the primary cause of lack of natural regeneration. Preliminary work with radioisotopes to study nutrient uptake by trees has been carried out in co-operation with scientists from Harwell. Parallel with studies on the successional loss of dry weight in the litter layers of two types of forest humus, intensive investigation of changes in the nitrogen content of oak and ash litter disappearing under field conditions has revealed striking differences between litter from the same source on mull and mor sites. Other work at Merlewood is concerned with the fungi of soil and litter. It has been found possible to transmit ultrasonic energy through fresh samples of oak, birch and pine approximating to healthy and living timber, and that transmission through wood is considerably reduced by slight flaws. Work at Furzebrook on ant populations involved alteration of the climate near the ground and use of radioactive phosphorus to measure populations. Another study was concerned with the factors which limit populations of adult dragonflies.

Surveys of myxomatosis in 1957 were concentrated on a more limited number of sites, in order to assess so far as possible the dangers in rabbit numbers in conjunction with botanical transect work. In coastal research, the most important and intensive work was that at Orfordness with pebbles marked with radioactive tracers and designed to yield information on movement of beach material, both longshore and on the sea bed, carried out with the Isotope Division of the Atomic Energy Research Establishment at Harwell during January–March, and notable for two changes in technique. The chief feature of climatological work during the year was the development of evaporation studies designed as a contribution to knowledge of the relation of water to land use and particularly of natural vegetation cover. Much has already been learned from the observations of potential evaporation at Anancaun (Beinn Eighe Reserve), Achnagoichan (Cairngorms Reserve), Moor House and Crug-las (Cors Tregaron Reserve), and on behalf of the Conservancy at Prabost, Isle of Skye and Lossiemouth. Besides the Scottish vegetation survey, in which about 700 vegetation analyses have been made and classified over the past three seasons, a reconnaissance survey was made of the soils and vegetation of Rhum.

The Nature Conservancy has notified local planning authorities of sixteen sites on canals and reservoirs selected for conservation because of outstanding scientific value, and in February 1957 it submitted evidence to the Departmental Committee of Inquiry into Inland Waterways. The recommendations of the Conservancy for continuance of research and observations on seals as at present, together with an attempt, sponsored by the Scottish Home Department, to discover means of protecting nets against seals, and, as an experimental and interim measure, limitation of further increases in the grey seal by an annual cull of 300 calves if authorized by the Minister of Agriculture, Fisheries and Food, were used as a basis for discussion with the parties concerned. The present position of the use of toxic chemicals in agriculture and food shortage was thoroughly reviewed at a meeting at the Nature Conservancy on September 26, when it was agreed that the two main lines of action should be to arrange with industry for research tests on selected species of birds, insects and fishes during the development of a product, and for field-observations on the effects of the use of the chemicals to be organized with the industry and societies interested.

Research on moor burning in the highland zone has hitherto been concerned largely with the most efficient ways of burning to provide heather in its nutritious stages while allowing it to regenerate quickly from root stocks. Recently, investigations have indicated that the long-term effects of moor burning, even under proper control and on a recognized system, may damage the productivity of the land; this work, carried out in the Moor House Nature Reserve and elsewhere, is to be followed up by more research, since clear evidence is essential if the present system of extractive pastoralism over considerable areas is against the national interest. The scourge of fires on heaths and commons appears to be increasing, and several practical suggestions emerged as a result of a conference called by the Nature Conservancy in February 1957. The biological effects of burning heaths are being studied at Hartland Moor and Morden Bog Nature Reserves. The red grouse investigation, supported by the

Scottish Landowners' Federation, continued principally in Glenesk, Angus, but to a subsidiary extent on half a dozen other moors. The Conservancy has also joined with other interested parties in Scotland in preparing a scientific and humane scheme for the control of red deer which should clear the way to remedy conditions which are a national reproach.

In dealing with the acquisition and declaration of nature reserves, the report refers in some detail to the Isle of Rhum and to St. Kilda, and reproduces the public statement relating to public access to Rhum issued in July. A primary purpose of acquisition is scientific research, and this is one of the few suitable areas in the Highlands where such research can be undertaken without interference with existing uses. The programme contemplated includes controlled experiments on the effects of burning and vegetation recovery, on run-off of water, on the diet and habits of red deer and particularly on the possibilities of restoring tree cover and planting shelter belts. It thus aims at the balanced long-term development of the natural resources of the island for scientific research and training, nature conservation and meat production. The reference to St. Kilda is of particular interest as showing how, given goodwill and a determination to help both sides, a major Services operation on ethnological and wild-life research can proceed in perfect harmony.

During the year the arrears of notification of owners of areas of special scientific interest were finally eliminated in England, but in Wales even greater difficulties have been experienced in tracing

the owners of some sites. In the seven years since the surveys were made on which the scheduling of the first English sites was based, conditions have in some instances changed, and at present no habitat type seems more threatened than Chalk grassland, where a re-assessment is urgently needed to protect the best remaining areas which are the refuge of many rare or local species of plants, insects and molluscs. The Conservancy has been obliged to press the strongest opposition to the project of the Tees Valley Water Board for reservoirs in Upper Teesdale, which cannot be reconciled with the conservation of an area characterized not only by the wealth of rare plants but also by an assemblage of species representing a wide range of geographical elements and their importance in post-glacial vegetation studies.

The present state of public knowledge of, and response to, the Protection of Birds Act, 1954, is still inadequate to fulfil the intentions of the Act; and the Nature Conservancy, in co-operation with the Royal Society for the Protection of Birds, has sought to give publicity of the provisions of the Act as well as to check unwise publicity about rare birds. The licensing system regarding the killing of wild birds appears to work smoothly, and in February 1957 the Conservancy held a small exploratory meeting of scientists immediately concerned with the diurnal birds of prey to discuss the present state of knowledge generally, whether any interrelation between predators and food is discernible and what is known of the biological role of birds of prey.

EVOLUTION AND THE COMMON MAN

PRIOR to a recent television series on evolution, the producer asked the Audience Research Department of the B.B.C. to equip him with information about the knowledgeability of potential viewers, their attitude towards evolution and, in particular, how far they believe there to be any conflict between the theory of evolution and other ways of looking at the origin of life, such as that set out in the Old Testament.

Of the 240 London viewers who took part in a series of discussions which were arranged at Broadcasting House, nearly half thought that evolution was connected with 'change', 'progress' or 'development', and half of these specified the process of change in physical things, in life, mankind or species. One in ten made a point of the gradualness of the changes involved. Slightly more mentioned that evolution was concerned with 'the origin of things', though this was not always with living matter or species or man. A third of the sample were unable to volunteer any statement at all.

Viewers were asked whom they associated with evolution. One in three could give no name; the name given by far the most (by one-third of the total) was that of Darwin. A few mentioned Huxley—but as many named Einstein. Other suggestions ranged from Aristotle to Attenborough, or Marconi to Mortimer Wheeler.

The groups were then given the names of a few selected persons whom they might rightly associate with the theory of evolution (Darwin, Huxley, Wallace and Mendel) and they were then asked how these people got their ideas and what they did.

About half the viewers were unable to venture any answer to this question. Of those who could, a fifth gave the title of one of Darwin's books, if not always accurately. An equal number said that "they came out with a theory"; and most of these identified the theory as indicating that "man is descended from monkeys", a few giving a more cautious and accurate version. Rather more than one in ten mentioned that the people who worked on evolution study the evidence; and half the viewers referred to specific evidence such as skulls or fossils or rocks. Most of the rest mentioned "studying life generally", "travelling far and wide", "*The Beagle*" or "studying other writings on the subject" as the source of ideas.

Viewers were asked how they thought 'the leaders', the people in important positions, felt about evolution. Those who replied fell into four roughly equal groups. One thought the idea of evolution to be generally accepted by 'the experts', the second thought that 'the leaders' were unconcerned about the subject, the third that they were of quite divided opinions, and the remaining group referred to disagreement between church leaders and others or the attempt to reconcile the religious view with the scientific view.

About two-thirds of the sample of viewers said they themselves believed in evolution; just over a tenth disbelieved the theory, the remainder having no firm opinions. Of those who said they believed in evolution, almost half were unable to advance a reason for doing so. More than a fifth said no more than that it was the "most tenable theory", but almost as many referred to the study of animals, the extinction of