and eastern flanks of the fen as the result of a difference in the rate of inorganic silting. It appears that, in north-west England, fen communities are only developed where substantial inorganic sedimentation occurs. Such communities are of a purely transitional nature, eventually giving way to bog as the organic/inorganic ratio of the substrate increases. Access to the reserve will not be restricted, but to collect specimens permission is needed from the Conservancy's officer at Merlewood.

Muckle Flugga and the Outstack, the northernmost of all the British Isles, are included in the new nature reserve of Hermaness, which is closer to the north pole than the southern tip of Greenland. Hermaness itself is a peninsula on the north-west of the Island of Unst, Shetland, and carries rough moorland with blanket bog on gneiss; there are many lochans and several miles of high sea-cliffs. The size of the reserve is 1,071 acres, all but 31 being on the mainland. The scientific interest of the reserve is mainly ornithological, in particular as an important breeding-station of the great skua, a bird with a very restricted distribution in the northern hemisphere but also breeding in the Antarctic. An ancestor of the present proprietor, Lieut.-Colonel Laurence Edmonston, was responsible for protecting the great skuas on Hermaness: in 1850 there were only two pairs; by 1890 there were not more than nine pairs; later the increase there and elsewhere was rapid; and to-day there are about five hundred pairs nesting on the reserve. In addition, the species has spread to other parts of Shetland and to the Orkney Isles. Besides great skuas, numbers of arctic skuas, red-throated divers, eider duck and arctic terns breed on the peninsula. The sea-cliffs contain an expanding gannetry and also colonies of guillemots, razorbills, kittiwakes, puffins, storm petrels and other birds. There is a watcher's hut on the slopes of Hermaness Hill. The Royal Society for the Protection of Birds will continue to provide a warden, as before.

With its great cliffs, Noss is one of the most spectacular islands in Europe. Divided from the mainland of Shetland by the larger island of Bressay, Noss Head rises to 592 ft., and the uninhabited island extends to 774 acres, mainly of rough moorland. On the cliffs there are many nesting gannets, guillemots, shags, kittiwakes, puffins, greater black-headed gulls and herring gulls. On the moorland there are colonies of great and arctic skuas, and the eider duck also breeds there. Geologically, Noss exhibits striking erosion in sandstone and phyllites of the Old Red Sandstone age. The Royal Society for the Protection of Birds will continue to provide a warden, as before.

The Castor Hanglands nature reserve was declared by the Nature Conservancy in June last year, and the present declaration completes the reserve by bringing in an area of 113 acres, under a lease from the Forestry Commission—the western portion of Castor Hanglands Wood which adjoins Ailsworth Heath. The woodland fringe now added completes a series of habitat types characteristic of this part of the Midlands, few examples of which still remain. The grass heath, which is not represented on the other Nene reserves, merges into the fringing shrub margin of the oak-ash woodland. The whole area has long been known for its rich insect life and particularly for butterflies, such as the black hairstreak and the chequered skipper. There are two small pools which support a variety of aquatic vegetation. Access to this area and the Blacklands part of the reserve is

by permit only, obtainable from the Conservancy's regional officer for East Anglia at 6 Upper King Street, Norwich.

The latest addition of a further 17½ acres to Kingley Vale completes this reserve of approximately two hundred acres which was first declared in 1952. The reserve includes a famous natural yew wood, chalk grassland on the downland slopes, and an area of heath overgrown by scrub on the plateau of Bow Hill. The additional area is a well-developed heath on the clay soil of the plateau and provides a marked contrast to the grassland of the chalk slopes. The predominant plants are heather and other species typical of acid soils, but there are also some chalk grassland species which have deep roots penetrating to the underlying chalky soil. Thus the area is of particular value for studying the distribution of species which are restricted to either calcareous or to acid soils. As with the rest of the reserve, there are no restrictions of access, but permission is required to collect specimens, application for which should be made to the Conservancy's regional officer for the south at Furzebrook Research Station, Wareham, Dorset.

THE MEDICAL RESEARCH COUNCIL

REPORT FOR 1953-54

THE report for 1953-54 of the Medical Research Council (pp. v+274. Cmd. 9506. H.M.S.O. 7s. 6d. net) follows the plan used during recent years. The work of the Council's many establishments is given only in summary, together with a list of the scientific papers published by the Council's many workers, from which the reader may learn the extraordinarily wide range of the Council's activities; but the main part of the report discusses each year, from a broader point of view, some aspect of the general trends of medical research.

This year the report considers, in a fascinating article entitled "Modern Trends in Chemotherapy", the remarkable researches which are gradually transforming our methods of treatment of many serious diseases. Not the least interesting part of this article is its introductory account of the evolution of modern methods of research in this field and the development of the co-operation between biologists and biochemists which has enabled us either to attack directly biochemical processes upon which the lives and activities of pathogenic organisms depend or, in some instances, to reinforce the defensive mechanisms of the host, so that the host is enabled to deal more effectively with the pathogenic organism that invades its body. This phase of chemotherapeutic research began with the discovery by Dr. D. D. Woods that sulphanilamide derivatives exercise their antibacterial effects by interfering with a metabolite essential to the pathogenic organisms concerned, namely, *p*-aminobenzoic acid, the chemical constitution of which closely resembles that of sulphanilamide. Sir Paul Fildes then supplied the hypothesis that an effective chemotherapeutic agent will be a substance that interferes with some essential metabolic reaction of the pathogenic organism, and that such a substance should be sought among compounds biochemically similar to those normally utilized by the pathogen. This Woods-Fildes theory is a special application of the results of earlier work by Prof. J. H. Quastel and

Dr. Marjorie Stephenson, which showed that enzymic reactions are inhibited by compounds chemically similar to those in which the enzymes normally produce a change. This is a good example of the way in which academic research may lead to ideas of practical importance and of the valuable results that may result from the policy consistently followed by the Medical Research Council of fostering fundamental researches of a kind that may form the bases of advances in practical methods of actually treating disease.

For details of the remarkable biochemical work now being done by the Council's workers, the article just mentioned must be consulted. It deals with work on factors which influence radiosensitivity, the action of biologically active substances on tissue cultures, blindness in premature infants, pernicious anaemia, cortisone in the treatment of ulcerative colitis, trends in research in human malnutrition, the neurotic in industry, pneumoconiosis, analgesia in midwifery and research on the mechanism of virus infection. The reader in search of dramatic developments will certainly find them here. Dramatic undoubtedly are the results achieved by the staff of the Strangeways Laboratory at Cambridge. Directed by Dr. Honor B. Fell, this Laboratory has been quietly developing for many years the tissue-culture technique as a tool which has widespread applications. The brief account given in this report of some of the results achieved shows what can be accomplished by this technique. Work on the effects of vitamin A on chick ectoderm growing in tissue cultures has, for example, not only confirmed that absence or deficiency of vitamin A results in keratinization, but also it has produced the remarkable result that high concentrations of vitamin A can convert growing ectoderm into ciliated epithelium secreting mucus that is indistinguishable from the normal epithelium of the respiratory tract of the chick. It seems, therefore, that one of the functions of vitamin A is to control the structure and function of certain epithelial cells, and the intact animal seems able to pick out of the circulating fluids the level of vitamin A needed for its normal development. Not less interesting is the tissue-culture work done on the effects of substances produced by the thyroid gland and by insulin.

Dramatic also is the work outlined in this report on the cause of blindness that developed in the United States and in Britain in premature infants. This proved to be a result of the action of oxygen treatment normally given to these infants. A result of this treatment apparently may be that, when a premature infant is exposed to high concentrations of oxygen for the periods of time formerly considered to be necessary, the blood vessels supplying the retina of the eye become constricted and eventually the blood supply to the retina becomes obliterated. When the infant is afterwards returned to normal air with less oxygen in it, the retina demands, so to speak, more oxygen, and an overgrowth of blood vessels occurs which is so exuberant that it results in filling the back of the eye with fibrous tissue in which the retina is involved, so that all power of sight is irretrievably lost. The remedy that has now been successfully applied is a drastic reduction of the oxygen treatment.

These two examples of the work recorded in this report will suffice to indicate the quality of the beneficent work that is being done by the Council. As the report itself implies, the discoveries which

attract public attention and bring great relief of suffering to mankind are inevitably based on long months of patient and unspectacular labour performed by many workers who each contribute something essential to the final triumphs. All these workers, whatever their status, deserve our gratitude, as do, indeed, all those others who work outside the Council's authority but contribute no less in their several ways to the general and continuous progress of medical research.

G. LAPAGE

UNIVERSITIES COUNCIL FOR ADULT EDUCATION

"ACHIEVEMENT under difficulty" is the dominant note in the report of the Universities Council for Adult Education for the year 1953-54 (Universities Council for Adult Education. Report on the year 1953-1954. Pp. 28. (Bristol: W. E. Salt, Hon. Secretary and Treasurer, 1955)). The timely financial assistance given by the Ministry of Education enabled extra-mural departments to carry on with their existing work and even to venture on a certain amount of exploratory work. While the total number of three-year tutorial classes fell, for the first time since the War, from the previous session's total of 1,001 to 974, the number of one-year sessional classes, which had fallen slightly in the previous session, rose by twenty-three to the record figure of 1,283. Six universities report increases in the number of three-year classes and no fewer than ten an increase in two types of longer courses. Moreover, London and Manchester achieved record numbers of three-year classes: the London total has been climbing steadily for some years and is now more than twice as large as before the War. The total number of students has increased with the number of classes.

A remarkable feature about the subjects of study is the rise of history to the leading place, with 684 classes out of the total of 3,994 as against 597 in the previous session and 584 in 1951-52. Most subjects show a substantial increase over the figures for the previous session, but only history, the sciences and the arts have yet recovered the ground lost since 1951-52. In the case of psychology, there has been a continued decline from 294 classes in 1950-51 to 184 in the present session. The number of courses in the physical and biological sciences increased by 56 during the year to a total of 434. Taken together, they stand fifth in the order of subjects, while the physical sciences alone stand higher than psychology, religion and government, and very little below philosophy.

A number of interesting courses and experiments was undertaken. Sheffield had large audiences for courses in "Twentieth Century Physics", "Electrons in Action", and various aspects of engineering; Bristol even larger audiences for "Seeing Atoms" and "The Living Brain"; while London was highest with the thousand who attended a course on "Atomic Energy". London held a rewarding residential course on "Embryology" for graduates in biology, and a similar 'refresher' course conducted by Birmingham, as one of an established series, had far-reaching results. The main problem in science was the provision of courses for non-scientists.

Interesting experiments have also been carried out in the supply of special courses for trade unionists.