

months in assisting university teachers and investigators who, on grounds of race, religion or political opinion, are unable to carry on their work in their own countries. The Council has collected records of about one thousand displaced scientific workers and scholars. One hundred and thirty-two have been given temporary research facilities in the Universities and University Colleges of Belfast, Birmingham, Bristol, Cambridge, Cardiff, Edinburgh, Glasgow, Hull, Leeds, London, Manchester, Nottingham and Oxford. In forty-two instances the Council has made maintenance grants for one year; such grants are limited to £250 a year for a married and £182 for an unmarried person. Donations received by the Council up to November 4 amounted to £9,695 14s.; this includes a donation of £500 from the Council of Trinity College, Cambridge. Unless a further substantial sum is available the Council can make no more grants. The Council is making inquiries throughout the world to discover permanent or semi-permanent openings for displaced academic workers, and every care is being taken not to prejudice the interests of university teachers or others intending to follow an academic career. The Council intends to appeal immediately for further funds, but to avoid a multiplication of public appeals of a similar character it has decided to issue its own in co-operation with the International Student Service, the Refugee Professionals Committee and the Germany Emergency Committee of the Society of Friends. Contributions—earmarked if desired for the Academic Assistance Council—may be sent to Mr. Walter Adams, the General Secretary of the German Refugees Assistance Fund (Academic and Professional) at 232, Abbey House, Westminster, S.W.1. (Telephone: Victoria 5927.)

#### Permanent Documents

THE preservation of documents, pictures and other records of historical importance is a problem of grave importance to librarians and others. The Royal Photographic Society in 1927 appointed a committee to recommend methods for the preservation of photographic records (*Phot. J.*, 67, 498-499; 1927). The report of this committee contained a very useful set of recommendations. It directed attention, however, to the fact that photography itself is so young that little can be said as to the ultimate 'staying power' of photographic records. The problem of permanence usually involves two main factors; the behaviour of the base and that of the characters or designs recorded upon it. The common bases used in photography vary greatly in stability, as may be judged by mentioning a few; glass, paper, celluloid. On the other hand, different types of photographic image show just as great variety. Other records, not photographic, present similar variations.

USUALLY the methods yielding records of outstanding resistance to chemical ageing, such as tile-making, etc., are troublesome, if only for the great bulk of the product. An invention by Mr. Everard Digby, 6 Queen Anne's Gate, London, S.W.1, appears

to have opened a new field for those who anticipate preserving records for all time. The process is based on photography and lends itself to the reproduction of any designs in line or half-tone, as well as to the reproduction of printed or other characters. All the advantages of accuracy are thus obtained. The novelty in the process consists in the use of gold and platinum as the working materials. In the examples which Mr. Digby has already shown, the main substratum is made from sheets of 14-18 carat gold 0.004 in. in thickness. Upon these are placed, in perfect contact, thin films of polished platinum. The characters or designs are then formed as matte areas on the polished platinum. The inventor claims that such metallic sheets will be immune from almost every possibility of chemical disfigurement. In addition they would not be so much exposed to the danger of being thrown away as being of no value.

#### Conference of Australian Physicists and Astronomers

THE fourth conference of Australian physicists and astronomers, arranged by local members of the Institute of Physics, was held in Melbourne on August 15-18, and was attended by fifty delegates from various parts of the Commonwealth. In his presidential address on "The Place and Value of Physical Science in the Modern State", Prof. Kerr Grant stressed the value of the study of pure science as a training for orderly and objective thinking. He showed that every advance in applied science is based on discoveries made in pure science, and urged the cultivation of scientific investigation for its own sake. An address on "Contemporary Physics" was given by Dr. H. S. W. Massey and a discussion took place on the organisation of the observatories in Australia (see *NATURE* of April 23, 1932), a question which had been referred to the conference by the Commonwealth Government. A description of the results obtained in the investigation of the effects of fading and of atmospherics in the reception of broadcast signals was given by the staff of the Radio Research Board. Because of the high incidence of thunderstorms in Australia, atmospheric interference is an important problem in broadcasting, and the results obtained with two cathode ray direction-finding stations and a narrow sector continuous recorder over a period of more than two years are yielding information of considerable value. A number of papers were also read describing research work in progress on the motions of electrons in gases, on the thermal conductivities of gases, on long wave-length X-rays, and on the oscillations produced by a valve oscillator. The radon purification plant in use in the Commonwealth Radium Laboratory, and that proposed for use in Perth, were described and discussed.

#### Progeny Records at Live-Stock Sales

It can be safely stated that the majority of the great 'improvers' of our breeds of live-stock were familiar with the criterion of judging the value of a sire by his progeny. In recent years, particularly as regards the breeders of dairy cattle, there has

been an increasing appreciation of the value of the progeny test. To assist breeders in this matter, the Hertfordshire Institute of Agriculture held on November 20 an auction sale, the catalogue of which is before us, of a number of young bulls, sons of "proven sires": this term connotes a bull whose unselected daughters are considered to have given a satisfactory yield. This enterprise is to be commended, though it is legitimate to wonder whether, in view of recent research, too much emphasis is not being laid upon the paternal grandsire of the heifers which the purchasers of these young bulls hope to breed. Greater value would be attached to the sale if daughters of proven sires were also on offer. Inevitably it has not been found possible to set a high standard, and critics of the catalogue should lay less emphasis on the fact that the average yields of the daughters of these seven proven sires have in no case reached 1,000 gallons, and rather be content with the fact that there has been made available an array of not only interesting but also reliable facts. There would, however, appear to be no excuse for describing as a proven sire a bull whose daughters' average yield was only 800 gallons and some 15 per cent less than that of their dams. Some officially recorded pigs were also sold. While this was not the first sale of this nature, the venture is likewise to be commended since it demonstrates a resolve on the part of some breeders to work, not by eye alone, but by scientific methods based principally on the rate of live-weight increase and carcass measurement. In view of the reorganisation of the pig industry in Great Britain, the movement is a timely one.

#### The Smithfield Club

THE effect of music upon fatted cattle, sheep and pigs will again be tried at the London Smithfield Club show in the Royal Agricultural Hall, Islington, on December 4-8 next. Milch cows have given a greater volume of milk under the influence of soothing music. This year, scientific investigators in animal foods and nutrition at Smithfield Show are to see whether beasts, which usually lose weight when appearing in fat stock exhibitions, cannot be made to maintain their rate of daily growth, when band music produced from gramophones and loudspeakers is played to keep them from becoming upset by the mobbing received from visitors. The King has entered 29 head of fat cattle, sheep and pigs, and the Prince of Wales, the Duke of Rutland, the Countess of Lonsdale, Lady Loder, Lord Danesbury and Lord Derby will also submit stock before the judges.

#### Annual Report of the Meteorological Office

THE annual report of the Director of the Meteorological Office to the Air Council for the year ended March 31, 1933, deals with the seventy-eighth year of the Meteorological Office. Details of the work of the various branches of the Office show that requests for meteorological information have again increased substantially in number over those received in the preceding year. The reorganised forecast branch at Adastral House, Kingsway, alone dealt

with nearly sixteen thousand, and the numerous local centres of the aviation branch, with more than thirty-seven thousand, without counting weather reports passed to aircraft in flight. The British climatology division disposed of more than two thousand general or scientific inquiries for particulars of past weather, many of which were required for legal purposes. The report states that the year has been one of consolidation of the numerous changes and developments of the years since the War, and that the figures quoted illustrate the general appreciation shown of the increased facilities for the provision of meteorological information that have resulted therefrom. The advancement of meteorological knowledge by research has not been neglected as a result of attention to the immediate needs of the public, a number of special investigations being carried out, for example, at Kew; the importance of the work of the expedition to Fort Rae, North West Territories, Canada, in connexion with the programme of the Second International Polar Year, has led to the inclusion of a special section giving an account of that work. This shows that success has been achieved in maintaining autographic records of the magnetic elements, of atmospheric electricity and of the more ordinary meteorological quantities, as well as in the ambitious scheme of auroral study. Although great doubt had been felt as to the chances of retrieving instruments carried by sounding balloons, several have been recovered with records reaching well into the stratosphere.

#### Secondary Sections of the British Grid System

NEARLY all the British grid operates at a pressure of 132 kilovolts. Two sections operate at 66 kv. and 33 kv. respectively, and there are a few relatively unimportant sections which operate at smaller pressures. In a paper read to the Institution of Electrical Engineers on November 9, Mr. C. W. Marshall describes the 66 and 33 kv. sections. In the scheme of the Central Electricity Board, there are 221 miles of 66 kv. lines and 1,319 miles of 33 kv. lines. Unlike the main grid, these subsidiary lines are mainly used for transmission purposes. The standard conductor material from which they are made is steel-cored aluminium. The minimum clearance between any line conductor and the earth in still air under maximum temperature conditions (50° C.) is 20 ft. If they have to cross Post Office lines then, whenever possible, the P.O. lines are interrupted and cables substituted for them at the crossing. If this is not possible, a guard is provided under the power lines. In this case the minimum clearance between guard and Post Office lines is 3 ft. and between guard and power lines 4 ft. When the power lines cross a railway, the minimum clearance is 24 ft. above rail level. Lattice steel towers are the standard for all the Board's 66 kv. lines and, with one exception, for all the 33 kv. lines also. During the period of the activities of the Board, the development of cable technique has been very rapid. The first cables were made with solid dielectrics, the single core oil duct type came next, then the three