

three-phase, four-wire alternating current system of supply is being taken as the standard, the pressure of supply from the three outers to the neutral main being 230 volts. There is still a large number of supply stations in Great Britain which do not use the standard system, and if they are to reap the benefits of standardisation they must change to a.c. In a paper by H. Blades and A. C. MacQueen, read to the Institution of Electrical Engineers on March 31, this change-over is discussed. They show that the problems arising in dealing with small towns and suburban and residential districts are different from those arising in industrial and city areas. In the former areas the change-over from d.c. systems to a.c. systems should take place at the earliest possible opportunity. As the life of a.c. low pressure cables is, as a rule, about twice as long as that of d.c. cables, the costs for renewals would be considerably diminished. Some eight years ago a supply undertaking replaced a large section of its direct current network with very satisfactory results. The total cost of the change-over was cheaper than the estimated cost of replacing the old d.c. system and the maintenance and development charges were appreciably reduced. The faults which frequently occurred in the mains when direct current was used now practically never occur. The best methods of carrying out the change-over are given in the paper, and the necessary arrangements that have to be made with the consumers explained. As the number of consumers who have radio receivers actuated from the mains is rapidly increasing, the change-over costs to the supply companies increases concurrently, and this in addition to the engineering and technical reasons makes an early change from d.c. to a.c. advisable. In industrial and city areas the best rate at which the change-over should occur depends on the demand and the condition of the direct current plant.

Clocks Worked from the Electric Supply Mains

WHEN a house is supplied with alternating current electricity on the time-controlled system, it is possible to use an electric clock which keeps almost exact Greenwich time, the error being at the most only a few seconds per week. The principle used in their working is that of the synchronous motor, which keeps in exact step with the frequency of the alternating current, and the frequency is controlled by a 'master controller' regulated by Greenwich time so as to make it easy to synchronise the generators connected with the network. The clocks cost from thirty shillings upwards, depending on the size and design of the case used. The first synchronous clocks were used in the United States about twelve years ago, and, from their inventor, were called Warren clocks. In America more than six million have been sold and in Great Britain about a quarter of a million (*Electrical Industries*, March 16). They are made of two types. In one class the clock is self-starting and in the other it has to be started if the current stops even for a fraction of a second. In the latter class a red disc usually appears on the rare occasions when it stops. The clocks require only about half the power taken by an ordinary electric meter, and

so the cost of running them is only a few pence a year. In America the sales are usually made by the electric supply companies, but in Great Britain the dealers who sell electric accessories and the clock-makers have taken up their sale. As a rule, the clocks require no attention for many months. In districts supplied by suitable alternating current, it is probable that this type of clock will supersede the escapement and pendulum type. Electric movements can be obtained to replace the ordinary clockwork movement of an existing clock.

The Akron, the Airship of the United States Navy

IN the new airship *Akron* built for the United States Navy there are incorporated several improvements which set new standards of efficiency for subsequent lighter-than-air machines. The ship is larger than most ocean liners and, unlike most of its predecessors, it is largely actuated by electricity and electrical apparatus. Particulars of the ship are given in the *Westinghouse International* for the first quarter of 1932. The power plant consists of two petrol-driven 11-kilowatt generators, with a motor generator set for battery charging. The total weight allowed for the electrical system on board was only 3000 lb. Aluminium alloys were largely used for the machines and cables, and all the circuits are controlled from the generator room. The radio system takes the heaviest load from the generators. The antenna system consists of two trailing antennæ and a fixed wire antenna. The latter is used for landing manœuvres and for auxiliary purposes. Fire risk is practically eliminated, the twelve supporting gasbags of the ship being filled with helium; but even if they had been filled with hydrogen there would have been little risk of explosion, as every power outlet on the ship is so constructed that the plug cannot be removed or inserted unless its switch is in the 'off' position. Miniature lightning arresters protect the ship from static charges of electricity picked up while the ship is in flight, especially when she changes from one equipotential surface of the earth's electric field to the other. These arresters also drain off any electrostatic charges that might be induced by the ship's radio. The telephone system has seventeen telephones, the switchboard on which the keys and lamps are mounted weighing only thirty pounds. A special feature of the *Akron* is the powerful searchlight which is used for signalling and for landing. It consists of a 500-watt lamp with a fourteen-inch reflector. In daylight tests its light is brilliantly visible at a distance of four miles.

Recent Acquisitions at the Natural History Museum

THE Zoological Department of the Museum has secured a mounted example of an exceedingly rare marsupial mouse, *Cœnolestes obscurus*, from Mount Pichincha, Quito, Ecuador. This species belongs to that group of marsupials which, from the possession of only two incisor teeth in the lower jaw, is known as the Diprotodontia. Except for this solitary species, found in a restricted area of the high Alpine country of the Central Andes in Venezuela, Colombia, Ecuador, and Peru, the diprotodont marsupials are found only in the Australian region. The Department of

Entomology has acquired the important collection of British Coleoptera (beetles) formed by the late Dr. David Sharp, who died in 1922. The collection comprises nearly 114,000 specimens, most of which were collected by Dr. Sharp himself. Dr. Sharp's general collection of Coleoptera, consisting of at least 300,000 specimens from all parts of the world, was purchased by the Museum in 1905. More than 4000 additional foreign specimens have been received with the British collection. The Trustees have approved the purchase for the Department of Geology of a collection of Nothosaurs from the Alpine Trias of Besano. These small swimming reptiles were precursors of the better known Plesiosaurs. The specimens acquired appear to belong to two species of the genus *Pachypleurosaurus*. There has been placed on exhibition in the Department of Geology, near the entrance, the first of a contemplated series of scenes representing the fish-fauna of succeeding geological epochs. It shows reconstruction-models of fish-like animals and true fishes that lived just when the Silurian was passing into the Devonian period. They are the earliest 'back-boned' animals of which fossil remains have been found. The models are posed in an illuminated scene, the surface of the underwater scene being just below the eye of a spectator of average height; at the eye-level, the distant hills of the Old Red Sandstone period are seen.

Minerals at the Natural History Museum

In 1930 the experiment was tried of issuing a free guide-leaflet to the exhibition collections in the Mineral Department of the Natural History Museum at South Kensington. The distribution of the leaflet is helped by some attractive exhibits of popular interest placed near the entrance to the gallery. By these means a considerably larger number of visitors have been induced to take an intelligent interest in the collections. The fact that 20,000 of these leaflets have been taken away by visitors, none being left as litter, proves that they have been appreciated. In the four-paged leaflet, attention is especially directed to the various uses of minerals by giving lists of gemstones, ores of the metals, other minerals of economic importance, building and road stones, ornamental stones, and radium-bearing minerals, with the number of the cases in which each may be seen. A third issue of 10,000 copies of the leaflet is now available.

Fellowships for Medical Research

THE Rockefeller Medical Fellowships and the Dorothy Temple Cross Research Fellowships in Tuberculosis for the academic year 1932-33 will shortly be awarded by the Medical Research Council, and applications for either should be lodged with the Council not later than June 1. The Rockefeller Fellowships are provided from a fund with which the Medical Research Council have been entrusted by the Rockefeller Foundation, and are awarded to graduates who have had some training in research work in the primary sciences of medicine, or in clinical medicine or surgery, and are likely to profit by a period of work at a university or other chosen centre in the United States before taking up positions for higher teaching

or research in the British Isles. A fellowship held in America will have the value of not less than £350 a year. The Dorothy Temple Cross Research Fellowships give special opportunities for study and research to persons "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms". Candidates must be British subjects and must possess suitable medical, veterinary, or scientific qualifications. The fellowships will preferably be awarded to candidates who wish to make their studies or inquiries outside Great Britain, and are of the value of not less than £350 a year. It may also be possible to award a senior fellowship of considerably greater value to a specially well qualified candidate wishing to undertake an intensive study of some particular problem of tuberculosis at a chosen centre of work in another country. Particulars of these fellowships are obtainable from the Secretary, Medical Research Council, 38 Old Queen Street, Westminster, S.W.1.

International Congress for Anthropology and Ethnology

THE proposal for the constitution of an international congress for anthropology and ethnology, which was put forward by the Royal Anthropological Institute, has elicited some interesting expressions of opinion from continental anthropologists. Two communications which have been received by the Council are published in *Man* for April. Dr. Fritz Krause, of Leipzig, president of the Gesellschaft für Völkerkunde, has been in communication with a number of ethnologists in Austria, Sweden, Holland, and Denmark, and has found that nearly all of them would prefer a congress covering ethnology only. Dr. Krause himself personally is in favour of a congress of 'ethnic sciences', of which the mainstay and principal field would be ethnology; but with 'adjacent sciences'—ethnic psychology, sociology, etc.—taken into account and permanently recognised. Dr. Krause has offered to push his inquiries further, and this offer the Council of the Institute has cordially accepted. The second communication is from the Very Rev. P. W. Schmidt, who concurs in the view that the interests of ethnology will be best served by a separate congress. In fact, he and his colleagues in Vienna consider that there should be separate congresses for ethnology, anthropology, and prehistory. It is felt, however, that a great advantage would be obtained from a periodically recurring joint congress of all three branches of study. A rotation of four meetings at intervals of two years between each, of which the fourth in each series should be a joint meeting of the three studies, is suggested. This has the obvious disadvantage of an inordinately long interval between the independent meetings in each subject.

Medieval Sussex

IN attempting to reconstruct the past geography of England, one of the chief difficulties is to bridge the gap between the Domesday Survey of 1086 and the topographical county descriptions of the seventeenth and eighteenth centuries. In a paper in *Geography* for March, Mr. R. A. Pelham has indicated