

### Research Items.

**THE COIN COLLECTION AT HULL.**—The Wilberforce House Museum at Hull contains an interesting collection of local coins and tokens, a catalogue of which by Mr. W. Sykes has now been published. A mint was established in the city by Edward I. in the year 1300, and two silver pennies, the only variety of coin, so far as is known, struck in this mint, are included in the collection. The inscription on the obverse is "Edwardus Rex Angliæ Dominus Hyberniæ," "Edward, King of England, Lord of Ireland," and on the reverse "Vill. Kyngeston," "Town of Kingston-upon-Hull." The collection of seventeenth century tradesmen's tokens is fairly complete, containing 30 out of 34 examples.

**THE ROMAN WALLS IN NORTHERN BRITAIN.**—The study of the Roman Walls has been considerably advanced by two papers published in the *Journal of Roman Studies* (vol. xi. part 1, 1921). In the first paper Mr. G. Macdonald discusses the building of the Antonine Wall, with a fresh study of the inscriptions; in the second Mr. R. G. Collingwood enters upon the history of Hadrian's Wall. These two exhaustive papers must form the basis of all later attempts to discuss the problems involved in their construction. Mr. Collingwood suggests that Hadrian's Wall was not, as one is apt at first sight to suppose, a military work intended to give tactical advantage to troops on the defensive, but a police work, intended to facilitate the patrolling of the frontier-line against unauthorised crossing.

**THE NORTHMEN IN ENGLAND.**—An admirable article in the April issue of the *Quarterly Review*, by Mr. Reginald Lennard, shows that so far from the warrior West Saxon kings like Alfred the Great being the protagonists in this period, it was the intrusion of the Northmen which changed the fabric of Anglo-Saxon society. This view is based partly on the work of sociologist-historians like Maitland and Vinogradoff, but mainly on that of philologists like Mr. Allen Mawer, who have been working at the place-names of northern England. The extent of the Norse vocabulary on place-names is a new and important discovery, and the writer points out that in the early English kingship, taxation, and the judiciary, the Norse influence was great. The explanation suggested is that the Norsemen gained by travel and commerce an experience denied to the home-loving Saxon. They were champions of freedom: the growth of the English manor was largely influenced by them: and in art the Norse spirit is now widely recognised.

**OUR TEUTONIC FORBEARS.**—Under this title Prof. F. G. Parsons contributes a valuable article, in which, from the point of view of an anatomist, he describes in the *Times* of April 14 the results of the exploration of Saxon burial-grounds at Margate, Mitcham, and Bedford-on-Avon. At Margate the dead are found buried in regular rows, as in a modern cemetery, a habit the Jutes brought with them from the continent, where the so-called "row-graves" or *Reihengraben* have been long recognised in North-West Germany. The Jutes' burials may be always recognised from their habit of burying an earthenware bottle, usually near the face of the dead: it possibly contained ale or mead for the refreshment of the ghost. From the arms and other adornments it is certain that at Mitcham and Bedford-on-Avon the sites were occupied by pagan Saxons, long-headed, long-faced members of the Nordic race, though every now and then a broad head of Mid-European origin turns up, warning us that the Angles, Saxons, and Jutes were

not an altogether pure race. The average height 5 ft. 6 in. contrasts with 5 ft. 9 in. of the average Englishman of our day. The well-worn teeth show that much of his food consisted of grain, roughly ground by soft stones; he suffered terribly from chronic rheumatism or osteo-arthritis, and among the men fractures, often wonderfully well set, appear; old head injuries are common, showing the rough, adventurous life they led. Most of them died before 40, and the proportion of adolescents between 15 and 20 was very great.

**SOCIOLOGICAL ASPECT OF FATIGUE PROBLEMS.**—In *Psyche* (vol. iii. No. 3) Miss Mona Wilson discusses the "Problem of Industrial Fatigue" in Great Britain. She states that she wishes to treat the subject from a sociological, rather than from a technical point of view, because, however valuable the results of scientific research into fatigue may be, they cannot be adequately utilised without a fundamental change in the relations between employer and employed. Until recently no systematic study of industrial fatigue had been undertaken in Great Britain. The War, however, with its urgent demands for maximum output, compelled the Government to consider the problem of fatigue in relation to output, and ultimately the Industrial Fatigue Research Board was established to study the human side of industry. Fatigue showed itself to be a very complicated problem, and already it has had to be considered in relation to problems of vocational selection, training, and motion-study, as well as to the more obvious problems of hours of labour, speed of production, division of the working day. As the problems are too detailed for a single body to undertake them all, the writer suggests that while the Industrial Fatigue Research Board might initiate lines of inquiry, some of the better organised trades might form Joint Research Associations responsible for their own investigations, and that for this purpose they might co-operate with the Institute of Industrial Psychology as well as with the Board. General conditions for working such Associations are given, and in particular there is emphasised the need for giving guarantees to the employees that, should the result of the research work be to employ fewer people, those displaced will be absorbed elsewhere. The article is worthy of careful consideration both by technical researchers, who sometimes tend to become absorbed in a too narrow aspect of their investigations, and also by the student of social problems, who not infrequently tends to neglect the scientific problems inherent in them.

**NEW EOCENE MOLLUSCA FROM TEXAS.**—Appended to "A geological reconnaissance in the Gulf coastal plain of Texas near the Rio Grande," by A. C. Trowbridge, is an account of the "New species of Mollusca from the Eocene deposits of south-western Texas," by Julia Gardner (U.S. Geol. Surv. Professional Paper 131-D). They are few in number but decidedly interesting. A subspecies of *Ostrea alabamiensis* seems the most abundant form, and *Cucullæa* one of the more conspicuous. There is a doubtful example of *Cerithium*, which on the plate has been styled "Melania?" and a handsome nautiloid referred to the genus *Enclimatoceras*, although as pointed out by Foord in 1891 (Cat. Fossil Cephalop. Brit. Mus., Pt. ii.), this should have borne the prior name of *Hercoglossa*.

**GEOLOGICAL RESEARCH IN SWEDEN.**—Volume 18 of the Bulletin of the Geological Institution of the University of Uppsala (1922) bears the name of

Hjalmar Sjögren as its editor; but it also records his death from apoplexy, early in the year. The long list of his papers, from 1877 onwards, and the appreciation so aptly written in English by Prof. A. G. Högbom, show how greatly geological science has lost by the passing of one who did not cease to be an investigator when he could also afford to be a patron. The Bulletin is prefaced by a portrait that will record Sjögren's truly noble personality for friends in every quarter of the globe; it is difficult to realise that he was already well on his way towards his seventieth year. The volume covers even a wider range than usual, from the crystallography of amphibole to Cretaceous mosasaurs from Texas. We may specially note G. Frödin's elaborate study of the highlands of central Sweden, including the Åre district, written in German, and his paper in English "On the analogies between the Scottish and Scandinavian portions of the Caledonian mountain-range." In the latter, as the result of his studies of deep continuous sections in Sweden, the author urges that the Moinian and Dabradian complexes in Scotland received their metamorphic characters during the Caledonian movements, and that they are formed of Torridonian (Sparagmite) and early Palæozoic formations, rather than of a pre-Cambrian series metamorphosed before Palæozoic times. However much this conclusion might simplify the stratigraphy of certain areas, it seems incompatible with the known unconformity of unmetamorphosed Ordovician beds on Dabradian schists and quartzites in western Ireland.

**OIL FIELDS AND THE GRAVITY BALANCE.**—The recent use of the Eötvös gravity balance by the oil companies in prospecting for new and exploring old oil fields has brought into prominence an extremely sensitive instrument devised nearly thirty years ago by Baron Eötvös, professor of physics at Budapest, and constructed in 1888 by Süss, then director of the mechanical training workshops of Budapest. The instrument and the measurements made by means of it were described in Hungarian periodicals in 1890 but were not generally known till 1896, when a short account appeared in the *Annalen der Physik*, vol. 59, p. 354. An instrument has now been acquired for the Science Museum at South Kensington, and a paper by Messrs. H. Shaw and E. Lancaster-Jones describing it and giving its theory and some account of tests made by means of it, appears in the April issue of the Proceedings of the Physical Society of London. The instrument consists of a fine fibre which supports a horizontal rod, to one end of which a small mass is directly attached, while from the other an equal mass is suspended by a second fine fibre. The instrument determines the difference of the values of gravity at the two masses, and according to Eötvös will detect a difference of  $1 \times 10^{-9}$  C.G.S. unit.

**MAGNETIC RECORDING DRUM FOR ELECTRIC RELAYS.**—It is now becoming increasingly difficult to differentiate between telegraph, telephone, and radio engineers. The paper read by Dr. N. W. McLachlan to the Radio Section of the Institution of Electrical Engineers on April 11 illustrates this. It is entitled "The Application of a Revolving Magnetic Drum to Electric Relays, Siphon Recorders, and Radio Transmitting Keys," and it is of equal interest to every kind of communication engineer. When the drum is magnetised, part of it is pressed on fixed iron rings with considerable force, and this alters the speed. The author finds that the tangential pull thus obtained is many times greater than the product of pressure due to the product of the magnetic attraction and the coefficient of friction. The ratio of the experimental pull to the calculated pull may exceed 50.

It is suggested that the operation of the device depends on some form of cohesive action brought into play by magnetism.

**UPPER AIR DATA IN AMERICA.**—Free-air winds at Lansing, Michigan, are dealt with by Mr. C. L. Ray, of the U.S. Weather Bureau, in the U.S. *Monthly Weather Review* for December 1922. Pilot-balloon observations have been carried out at this station daily since June 1919, flights having been made for more than two years at 7 A.M. and 3 P.M., except when impossible through bad weather. Latterly, observations have only been made at 3 P.M. For the three-year period, the results are given for the four seasons of the year for various altitudes from the surface to 6000 metres, and the percentage of the winds from various directions is shown. More than 50 per cent. of the surface winds have a south component and more than 56 per cent. have a west component. At 4000 and 6000 metres the predominant direction lies between west and north-west. The variation of the winds with altitude for each season is given by tables and graphs. Surface velocities average about three metres per second. At 250 metres the velocities average two and a half times greater than at the surface. Above 1500 metres, winds are consistently west to north-west. Velocities are greater in the winter months, and at the 6000 metre elevation the average reaches 27.7 metres per second as compared with the summer mean of 12 metres per second at that level. In the upper levels the easterly winds do not reach the velocities attained by the westerly winds. Winds with a surface south component all show a clockwise movement with altitude and generally have a west-south-west direction at about 2000 metres. There is a more or less persistent north component to the highest levels. The highest velocity reached at Lansing was 83 metres per second from the north-west at an altitude of about 7000 metres on December 17, 1919.

**ICE PATROL SERVICE IN NORTH ATLANTIC.**—The U.S. *Monthly Weather Review* for December 1922 contains an article by Lieut. E. H. Smith on "Some Meteorological Aspects of the Ice Patrol Work in the North Atlantic." The disaster to the s.s. *Titanic* on April 14, 1912, when what was then the largest ship afloat was sunk by striking an iceberg off the tail of the Great Bank of Newfoundland, resulted in an ice patrol being established with the object of preventing the recurrence of a similar loss. The patrol was of International origin, the management of the service being undertaken by the U.S. Government. It is now about ten years since the service has been in operation, and much information has been gathered as to the determination of the variable limiting lines of menacing ice, and efforts have been made to determine the causes of the variations as to seasonal and other differences. Glaciers on the west coast of Greenland are said to be the great source of icebergs which appear during March drifting south along the east side of the Great Bank, and during April, May, and June they constitute a menace to steamships. The summer winds in West Greenland, the birthplace of the bergs, have an immense influence on the number of bergs over the North Atlantic in the following season. Off-shore winds drive a great number of bergs westward into the southerly current, while on the other hand, on-shore winds tend to cause a poor ice year. It is said to take approximately five months for a berg passing Cape Dyer to appear south of the 45th parallel. If the dates of the bergs passing Cape Dyer were known, long-range forecasting of ice conditions in the North Atlantic would probably be possible.