

Research Items

British Hanging Bowls.—In *Antiquity* for June, Mr. T. E. Kendrick has published a study of the hanging bowls of bronze with special reference to their position in the cultural history of Britain. Hanging bowls, already known in Britain in La Tène times, returned into fashion in the second half of the Roman period. An approximate date of A.D. 400 is suggested for the hiding of a hoard found at the Romano-British settlement at Irchester. The most decorative bowls are those fitted with escutcheons in the form of enamelled discs. They may be grouped under three sub-headings: (i.) The 'Romanising' series; (ii.) the 'ultimate La Tène' series; and (iii.) the 'developed trumpet-pattern' series. In the Romanising series, the escutcheons show the inspiration of classical ornament and come down possibly to a date not later than 500 B.C. The 'ultimate La Tène' series is the work of craftsmen who were still resolutely Celtic, and had no sympathy with Roman and contemporary continental design. They represent the continuation of the native enamel work of the north. The Barlaston bowl and the Northumberland escutcheons, which belong to this class, cannot be later than A.D. 300. The contrast with class iii., the 'developed trumpet-pattern' series, is very striking. Here the work is primarily concerned with the modifications of the late Roman pelta trumpet-patterns, which are transformed with all the grace of the British artist. These decorative designs later became the stock-in-trade of the illuminator; and it is suggested that they are not the renaissance of an ancient Celtic art, but an independent Celtic experiment which developed a borrowing from late Roman art. Although the bowls are for the most part found in Saxon graves, they were loot; and the Saxons probably contributed nothing to their manufacture.

Palæolithic Art in the Grotte d'Isturitz.—M. le Comte René de Saint-Périer has described (*L'Anthropologie*, 42, Nos. 1-2) two remarkable examples of palæolithic art which have been discovered in the course of excavating the inner chamber of the Grotte d'Isturitz (Basses Pyrénées). They are derived from a lower Magdalenian stratum without harpoons, above which are, possibly, two Magdalenian strata in which harpoons appear. One of the objects is a sculptured bear in limestone, 51 mm. high by 20 mm. thick. Great care has been given to the proportions of the figure. The limbs have been broken off by an ancient fracture almost level with the body. The sculpture is charming in its correct representation of the characteristic modelling, attitude, and expression of what is clearly *Ursus arctos* and not *Ursus spelæus*. The second object is of bone, 120 mm. high by 20 mm. by 2 mm. thick. The ends are broken off. It is engraved on both sides. On one side is a bison of fierce aspect, realistically engraved to show the distribution of the hair. Two harpoons or barbed javelins are in its flank, and two columns of hot breath issue from its nostrils as it follows another bison, of which the hind-quarters have just survived the fracture. On the other side, two crudely engraved human figures, male and female, appear, which in their relation one to another are unique in palæolithic art. The woman, whose head is broken off, is fat but not enceinte. Hair is shown freely distributed over the abdomen, thighs, and the one breast visible. Bangles encircle one ankle; a barbed javelin head appears on the right thigh; and the arms are raised as if in prayer. The man, of whom half remains, is in the same attitude with arms upraised and face looking up towards the woman above his head. He wears necklaces and bracelets.

Identical Twins reared Together.—The studies of Dr. H. H. Newman on twins reared apart (see *NATURE*, May 7, p. 692) are to some extent supplemented by Mr. Harold D. Carter's account (*J. Heredity*, vol. 23, No. 2) of identical twins reared together. In Case 1—boys of fourteen years of age—one of them reads more and appears somewhat brighter; but it is not clear whether he is brighter because he reads more, or reads more because he is brighter. The Siamese twin girls aged fourteen years studied by Dr. Helen Koch were found to differ distinctly in intellect and achievement, but the differences are less than in most twins. Such differences are regarded as innate and not environmentally produced. In Case 3 (brothers of sixty years) the twins were more unlike than in Case 2 (sisters of thirty-eight years), although the similarities of environment were greater in the former case. In Case 2, the difference in ability was in favour of the twin with less favourable environment, again suggesting that a difference in mental endowment was determined internally rather than externally. In all these cases the twins were extremely alike, often mistaken for each other, and their finger patterns almost or quite identical.

Control of Leather-Jackets.—Among other articles of practical value and interest in the sixth issue of the *Journal of the Board of Greenkeeping Research* is one by R. B. Dawson, which deals with the question of the control of leather-jackets, the larvæ of *Tipula paludosa* or daddy-long-legs, which may be very destructive on golfing turf. The subject is introduced by an account of the life-history and habits of the insect, knowledge of which is essential if suitable control methods are to be found. For small, level areas, the practice of spreading tarpaulins or rubber mats overnight on grass which has been soaked with water often proves successful, as the larvæ collect at the surface. For larger areas, applications of a chemical larvicide is more practicable, and a 64 per cent emulsion of orthodichlorobenzene is specially recommended. This has proved a thoroughly trustworthy method of control, and only temporarily discolours the grass. Full instructions for making and using this emulsion are supplied, the cost of the treatment being 8s.-12s. per 500 sq. yards. Other methods involving the use of materials such as naphthalene, paris green, ammonia solutions, etc., may also be effective in controlling the pest, but they are less unreservedly recommended, as they are apt to be unreliable, and in some cases have poisonous properties.

Characteristics of Home-grown Timbers.—With the introduction of research into the mechanical and physical properties of timbers, it has been necessary not only to standardise the meaning and application of technical terms and the methods to be followed in the tests, but also to compile and publish the results in rather complicated tabular statements. In order to place this information in a form more readily accessible to those who wish to have a general comparison of our home-grown timbers in their relative strengths as developed in various types of construction and manufacture, the Forest Products Laboratory has issued *Bulletin No. 12*, entitled "Some Characteristics of Home-grown Timbers" (pp. v + 11 + 9 plates. London: H.M. Stationery Office, 1931. 2s. net). The publication deals with the characteristics of eight home-grown hardwoods and five softwoods: oak, ash, beech, common elm, Dutch elm, wych elm, chestnut, and poplar (*P. serotina*); Corsican pine, Douglas fir, European larch, Scots pine, and silver

fir. The strength properties of the species are compared by means of diagrams in which the height of a column denotes the degree of the property attained by the particular timber, as compared with the same property in home-grown oak; these diagrams are explained by notes, which give not only the applications of the various strengths and other properties depicted, but should also afford considerable assistance in the selection of timber for a given purpose. Besides the general comparisons above mentioned, there are graphs which show the influence of the specific gravity of a timber upon its relative strength, as well as diagrams indicating the relative shrinkages which take place in the timbers. These last are of particular interest in the case of woods for panelling, flooring, patterns, and other uses where shrinkage and the 'working' of the timber with change in atmospheric humidity are of considerable importance.

Earthquakes, Fisheries, and Flower Fall.—Prof. T. Terada has shown that there exists a curious relation between the numbers of earthquakes in the Idu peninsula and the numbers of fishes caught near the northern end of Sagami Bay (*Proc. Imp. Acad. Tokyo*, vol. 8, pp. 83-86; 1932). During the spring of 1930, swarms of earthquakes occurred in the neighbourhood of Ito on the east coast of the peninsula (*NATURE*, vol. 126, pp. 326, 971). It was found that the epochs of abundant catches of horse mackerel (*Caranx*) at the Sigedera fishing ground coincided very nearly with those of the earthquakes. This result led Prof. Terada to compare the numbers of fishes caught in the six years 1924-29 with the numbers of felt and unfelt earthquakes in and near the Idu peninsula. For the year 1928, the parallelism of the two curves was very close, though in other years it was less conspicuous. During 1928, the curve representing the numbers of immature tunny (*Thynnus*) caught shows a remarkable similarity with the horse mackerel and earthquake curves. In another paper (*Bull. Earthq. Ves. Inst.*, vol. 10, pp. 29-35; 1932) Prof. Terada points out that, though the daily numbers fluctuate, the time-distribution curve of the Ito earthquakes resembles on the whole the probability curve, and he shows that the daily number of falls of camellia flowers follows a similar statistical distribution.

Meteorology of the North and South Atlantic.—Continental meteorologists have in the past played an important part in the collection of information about the weather over the Atlantic. The long series of daily synoptic weather maps for Europe and the Atlantic prepared by the Danish and German Admiralties before the War were for many years without rival for completeness, and have been of constant assistance to the forecasting staff of the Meteorological Office, Air Ministry, in the study of large scale air movements and their effect upon British weather. The last section of a new contribution, of a more statistical nature but dealing with an almost equally large area—namely, the North and South Atlantic—has just been received. It has been compiled under the direction of Prof. E. Van Everdingen, the director of the Dutch Meteorological Service, and summarises about seven million observations of oceanic current, wind, barometric pressure, temperature, and cloud, covering the three months September, October, and November for the years 1870-1925, the other quarters having already been dealt with. It takes the form of a series of large charts with explanatory matter and tables (*Pub. No. 110, Koninklijk Nederlandsch Meteorologisch Instituut*). It is scarcely necessary to say that such a compilation is of immense value to those engaged in a study of world weather, and that it will be a mine of information for future compilers of

climatological handbooks and treatises. It includes detailed studies of the more important disturbances which are of danger to navigators of the Atlantic, such as the cyclonic depressions of the North Atlantic, the West Indian hurricanes, and the 'tornadoes' or storm squalls of the West African coasts. These last, it should be mentioned, differ greatly from the American tornadoes, which are much more violent, but fortunately also individually affect much smaller areas and are in the main land phenomena outside the scope of this work. Assistance in the supply of data has been given by the French, German, and English meteorological services; this is therefore the concluding section of a great international undertaking.

Vacuum Distillation.—In a paper on vacuum technique (*J. Franklin Inst.*, Feb. 1932), Dr. K. Hickman of the Kodak Research Laboratories has directed attention to the serious errors which may occur in the measurement of the saturation vapour pressure of liquids when that pressure is of the order of a millimetre of mercury. Unless the vapour pressure is measured close to the thermometer which gives the temperature, the correction for the drop of pressure from thermometer to manometer becomes of the order of the pressure to be measured. Dr. Hickman enlarges the head of the rectifying column, places the thermometer in the enlargement, and either measures the pressure there directly or by the aid of a column of the condensed liquid in a U-tube between the enlargement and the manometer. With this arrangement, he finds that the relation between log (pressure) and the reciprocal of the absolute temperature continues to be linear down to very low pressures.

Spectrum of Lithium Hydride.—A further analysis of this spectrum, which is one of considerable complexity, is given by G. Nakamura and T. Shidei in the *Japanese Journal of Physics* (7, p. 33). In their previous work, a large number of faint lines were not classified; in the present investigation, it has been found possible to include many of these in a band system which is attributed to the hydride (Li^6H) of the lighter and rarer lithium atom, but the very curious feature emerges that the relative intensities of the lines associated with Li^6 and Li^7 respectively vary with the conditions under which the spectrum is taken. This is in accord with Dempster's work on lithium with the mass-spectrograph, but not with that of Bainbridge. This spectrum has the further point of interest that it arises from two of the lightest atoms, so that it is not impossible that it may serve to check a quite full quantum theory of their combination; the theory of the normal state of the molecule has already been developed in some detail by Hutchisson and Muskat in the first May number of the *Physical Review*.

The Electron Microscope.—It has been known for many years that a divergent pencil of electrons can be refocused by a magnetic field. More recent investigations, which are summarised by E. Brüche and H. Johansson in *Die Naturwissenschaften* (May 20), have shown that an electric field can act similarly, and, in fact, that a complete system of electron-optics exists, with reflecting and refracting surfaces in the ordinary sense replaced by regions of field acting upon moving electrons. Brüche has demonstrated the action visually by photographing beams of electrons passing through 'electron-lenses' in gas at low pressure. In this article an account is also given of an electron-microscope which is likely to be of use technically; it is constructed much on the principle of an ordinary microscope, but with electron lenses, and shows a much enlarged image of a small electron-emitting

surface by the fluorescence of the points of impact of electrons which have passed through the 'microscope' on to a screen. The whole arrangement is like a small optical bench set up in a vacuum vessel. Two examples of its application are given: the first, a 150-fold enlargement of a badly coated oxide cathode, showing clearly the patchy nature of the active surface, which could not have been inferred with such certainty from an ordinary optical study; and, secondly, a set of enlargements ($\times 65$) showing the migration and final disappearance of the active centres on an overheated coated cathode. It would appear to be possible in principle, although scarcely in practice, to obtain pictures of the electron-emitting areas on the surface of the sun from experiments on the streams of charged particles which produce the aurora.

The Wassermann Test.—Many variations of the Wassermann test have been described, with the view of increasing its sensitiveness and rendering it more specific, thus eliminating the doubtful reactions, which are of no value to the clinician. E. J. Wyler has recently described an improvement in his routine test, by which more accurate results can be obtained (Reports on Public Health and Medical Subjects, No. 67. London: H.M. Stationery Office, 1932. 4d. net). In the test, the suspected serum, previously heated to 55° for 30 min. to inactivate complement, is mixed with complement (guinea-pig's serum) and antigen (alcoholic human heart extract, 3 parts, with

2 parts of a 1 per cent alcoholic solution of cholesterol) and incubated at room temperature for 30 min. and then at 37° for 30 min. A standardised suspension of sheep's red blood cells sensitised with at least six doses of hæmolytic immune body is then added; hæmolysis occurs quickly when the suspected serum does not come from a case of syphilis, but is absent or incomplete when the patient has suffered from syphilis which has not been completely cured—in other words, the Wassermann test is positive. In all tests, control tubes are put up containing serum and complement but no antigen: ysis of the sensitised red cells should be quick and complete, when added at the end of the preliminary incubation, in the presence of three minimal hæmolytic doses of complement. The variations in the method concern the amounts of complement, antigen, or serum added and the type of antigen used. The author has found that the greatest sensitiveness is attained when the amount of serum is increased from three up to five times that normally used, whilst variations in the quantities of the other reagents gave less satisfactory results. 20 per cent of sera which were negative or doubtful by the routine test gave a definite positive response with the new method. In non-syphilitic sera, there were no false positives and only 2.6 per cent were doubtful: with the ordinary test, 9.3 per cent were doubtful. The new method is also more sensitive than the flocculation or Sigma test, which itself is more sensitive than the routine Wassermann test.

Astronomical Topics

Two New Comets.—A telegram from the I.A.U. Bureau, Copenhagen, announces the discovery of a new comet by Mr. Newman, who gave the following position for 1932.0:

U.T.	R.A.	N. Decl.
June 20 ^d 4 ^h 49.4 ^m	15 ^h 37 ^m 16 ^s	7° 56'
Daily motion, - 2 ^m 8 ^s , + 44': Magnitude, 13.0		

From observations on June 1, 7, and 20, Whipple and Cuningham have determined the following elements:

$$\left. \begin{aligned} T &= 1932 \text{ Sept. } 27 \text{ U.T.} \\ \omega &= 73^\circ 50' \\ \Omega &= 244 \text{ } 50 \\ i &= 76 \text{ } 50 \\ q &= 1.57 \end{aligned} \right\} 1932.0$$

The following ephemeris is for 0^h U.T.:

	R.A. (1932.0).	Decl. (1932.0).
June 30	15 ^h 20 ^m	+14° 0'
July 4	13	16 10
8	15 8	18 10

The following observations have been made by Dr. W. H. Steavenson with his reflector at West Norwood. Equinox 1932.0:

	R.A.	Decl.
June 21 ^d 23 ^h 9.7 ^m	15 ^h 34 ^m 3.1 ^s	+ 9° 4' 42.6"
22 23 9.5	15 32 10.2	+ 9 43 48.0
25 0 19.3	15 28 26.5	+10 51 16.9

The B.D. position of the comparison star, B.D. + 9° 3075, was used. The comet preceded it by 1.0^s, and was 7' 19.1" north of it. The diameter was 1, and there was a nearly stellar nucleus of magnitude 12. The approximate daily motion indicated is about - 1^m 41^s, + 38'. The comet is well placed for observation.

A Reuter's telegram from Wellington, New Zealand, announced the discovery of a comet of the 10th magnitude by the New Zealand Government Astro-

nomer; the message was dated June 23, but the discovery was presumably on June 22 by U.T.

R.A. 9^h 15^m decreasing.
S. Decl. 84° 36' decreasing.

This makes the seventh cometary discovery of the year, including the van Biesbroeck object of March 6, which was not seen again. Two of the seven (Grigg-Skjellerup and Kopff) were the returns of periodic comets; the others appear to be new comets.

The Coming Total Solar Eclipse.—An article by Dr. A. V. Douglas (*J. Roy. Ast. Soc. Canada*, May-June) gives information about the arrangement of parties to observe this eclipse, and suggests how amateurs can help. Observations of the exact limits of the path of totality are suggested; this was satisfactorily carried out in the eclipse of January 1925; also observations of the shadow-bands, of the fall of temperature, and of the degree of illumination during totality (by seeing at what distance small type can be read). It is also suggested that wireless experts may study the effect of the eclipse on radio-transmission. Dr. Douglas gives a list of coming totalities; but, curiously, as in several lists, the favourable eclipse in Norway on July 9, 1945, is omitted; this is a return of the British eclipse of 1927, but with a higher sun and longer totality. Prof. C. A. Chant, in the same journal, gives details of the location of the various parties of observers. Dr. J. Jackson and Mr. C. R. Davidson from Greenwich, with Dr. Knox Shaw, are going to Parent, north of the St. Lawrence; Prof. F. J. M. Stratton to Magog, on the south side of the River; Profs. A. Fowler and H. Dingle will observe from McGill University, near the edge of the belt of totality. A party from the Royal Astronomical Society will go to a station in Maine. Nearly all the great American observatories are sending parties, and others are going from Japan and Pulkovo. Given fine weather, it should be one of the best observed eclipses on record. A map of the portion of the track from the St. Lawrence to the Atlantic is given in the B.A.A. Handbook for 1932.