

## Current Topics and Events.

ANYTHING that will cheapen the cost of the electrification of our railways deserves serious study at the present time. In the United States, a continually increasing number of automatic sub-stations are being employed in electric traction. It is interesting, therefore, to notice that in the extension of the London Electric Railway from Hendon to Edgware, which opened for traffic on August 18, there is a completely equipped automatic sub-station. Although there are several of these stations in Great Britain in connexion with lighting networks, this is the first to be used for traction purposes. The building has been designed for three 1200-kilowatt rotary converters with all the necessary control gear and accessories. The sub-station gets a 10,500-volt three-phase supply from the Lots Road Generating Station at Chelsea, the frequency being  $33\frac{1}{3}$ . It is situated at Burnt Oak, which is one mile from the Edgware terminus and four miles from the manually operated sub-station at Golder's Green. To start a rotary converter at Burnt Oak, it is only necessary to close a switch at Golder's Green, all the subsequent operations being automatic. Cooling air for the transformers is supplied by a centrifugal blower. The automatic devices protect the machines in all conditions of overload. For example, when the load is too heavy, the circuit breaker opens and a resistance is inserted in the machine circuit and the rotary is disconnected from the supply mains. After a short interval the circuit breaker closes again and connexion is re-made. If the fault has been cleared, normal operation is resumed, but if not, the same sequence of operations happens again. If this happens a fixed number of times, the breaker is automatically locked and an engineer must be sent to investigate and remove the fault.

At the conversaciones of the Royal Societies of Western Australia and New South Wales, held on June 28 and July 2, fitting celebrations were made of the centenary of the birth of Lord Kelvin. At the former there was an extensive exhibition of Kelvin apparatus and relics, including a series of photographs and engravings of the Old College at Glasgow. Lecturettes were given illustrating various phases of Kelvin's life and work. Their titles were "Gyroscopes," "The Atlantic Cable," "The Age of the Earth," "Glacier Motion," and "Solar Heat." At Sydney, Prof. H. S. Carslaw—an old pupil of Kelvin's—gave a memorial oration. He recalled the fact that two of the most famous periods in the history of mathematics in England were the age of Newton and the years during which the school of mathematical physics arose and flourished in Cambridge. Of the great names of that period without doubt the greatest was Kelvin. He had made valuable contributions to almost every branch of mathematical physics, and was the greatest pioneer of the age of electricity. It was peculiarly fitting that Australians should commemorate Kelvin, for his work on navigation made it much safer for them to cross the 12,000 miles of ocean which separated them from the homeland.

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The age of steam has done much for Australia, but the age of electricity has already done more.

SCOTLAND has never yielded, nor is it likely to yield, the range of prehistoric civilisations which successively flourished in southern Britain, for the incidence of the Ice Age markedly reduced the habitable period in the northern kingdom. Yet it is possible that Scotland may furnish evidence on an important and obscure stage in the more recent history of prehistoric man, namely, on the transition from Azilian to neolithic culture. So far, the shell-mounds and kitchen middens of Oransay and elsewhere have given clues to one culture or the other, but none has shown a continuous habitation throughout the critical period. It is our belief that the places most likely to reveal such are the caves, and since these have been very imperfectly surveyed in Scotland, each new cave-excavation not only deserves commendation and encouragement, but raises hopes of outstanding discoveries. On the Mull of Kintyre, about four miles south of Campbeltown, the Kintyre Antiquarian Society has, with the assistance of Mr. L. M'L. Mann, set about excavating St. Kieran's Cave. Their findings, recorded in the *Glasgow Herald* of July 31, included an incised symbol clearly of Christian origin, flint implements, bone objects, and a human skeleton, buried in a short cist, and accompanied only by a worked flint. The skull is compared conjecturally with the famous dolichocephalic skulls of the Oban caves. The digging revealed the presence of several layers of habitation, but the details given are not sufficient to indicate the ages of the deposits, and the results of expert examination of the relics will be awaited with interest.

MR. J. H. MAIDEN, who for nearly twenty years has been government botanist of New South Wales and director of the Sydney Botanic Gardens, has recently retired under the age-limit. Born at St. John's Wood, London, in 1859, Mr. Maiden went to Sydney about forty-five years ago. Before leaving England he had studied botany under Prof. R. Bentley and Prof. D. Oliver, and shortly after settling in Sydney was employed in the Technological Museum there, becoming curator and secretary in 1882, after a year's service as acting curator. While holding these offices his botanical work was chiefly connected with economic plants, on which he contributed numerous papers to journals. In 1889 he published his well-known book: "The Useful Native Plants of Australia," and in 1890 appeared the first of the three editions of his "Wattles and Wattlebarks." During Mr. Maiden's directorship of the beautiful Botanic Gardens, Sydney, to which he was appointed in 1896, many improvements in them have been effected, and he had the satisfaction of seeing the erection of the fine new building in which are accommodated the Botanical Museum and Herbarium; this was completed in 1901. Holding important administrative and advisory posts it might be supposed that he would have had little time for authorship. Yet by his writings he has won a world-wide

reputation and a high position among the greatest botanists of his adopted country. "A Critical Revision of the Genus *Eucalyptus*," now in its seventh volume, is in itself a fine achievement. "The Forest Flora of New South Wales," of which seven volumes have been completed, is another. Mr. Maiden is also the author of several other independent works and of a multitude of papers in journals of societies and other publications. He has served a number of the scientific societies of Australia in various offices, and was president of the Royal Society of New South Wales in 1896-97 and again in 1911-12. Mr. Maiden became a fellow of the Linnean Society of London in 1888, and in 1915 received its Gold Medal. He was elected a fellow of the Royal Society in 1916, and in the same year was appointed to the Imperial Service Order. We look forward to the completion of his valuable Revision of the Genus *Eucalyptus* during the coming years.

IN a circular letter dated July 10, M. Sampaio Ferraz, director of the Meteorological Service of Brazil, urges the publication of reports of abnormal weather or abnormal wind circulation in some central publication, say the *Meteorological Magazine*. The abnormal wind and excessive rain experienced in Brazil during April and May of this year are quoted as a type of the information which might be collected in this manner. M. Ferraz suggests that all information for a particular month should appear in the same number of the *Meteorological Magazine*. The scheme put forward appears to us to be highly desirable, and it is to be hoped that either the *Meteorological Magazine*, or the Royal Meteorological Society, through its Quarterly Journal, will be able to make arrangements to publish such reports as are suggested from all the meteorological services and institutes of the world, two or three months in arrear. In the past, the publication of reports of abnormal weather conditions has been left largely to the *Meteorologische Zeitschrift*, but it is highly desirable to make a more systematic collection of such data, and to make them available in an English periodical.

THE August issue of the *Scientific Monthly* contains the address of Dr. Arthur D. Little to the Engineering Division of the National Research Council of the United States, under the title "Research: the Mother of Industry." After a short account of the great advances in industry during his own lifetime, he directs particular attention to the developments of the decade 1890-1900, during which Hall brought out the aluminium process, Acheson made carborundum, Willson calcium carbide, Diesel invented his engine, Cross and Bevan made artificial silk, Little himself produced cellulose acetate, Rontgen discovered the X-rays, Becquerel radioactivity, Madame Curie radium, and Marconi sent a wireless message across the Bristol Channel. On nearly every one of these discoveries an industry has been founded, and Dr. Little points out that while in the past the United States has prospered because of its cheap land and abundant raw materials, it can only maintain its

position in the future by making use of every assistance science can afford, and that industry must in its own interest support research generously.

THE value of chemical evidence in archæology is generally known, and there are many examples of mistakes which have arisen from lack of chemical knowledge; for example, the description of early metal objects from Mesopotamia as "bronze," whereas in reality they are almost pure copper. In a very brief note in the *Cairo Scientific Journal* for July, Mr. A. Lucas gives some further examples. The black appearance of mummies is generally attributed to the use of bitumen, whereas it is either the result of a change of the flesh itself or of resin, or gum-resin, which has blackened by natural processes. No evidence has yet been found of the use of bitumen or mineral pitch, although they may have been used in Ptolemaic times. Castor oil has been described as honey and as natron, alkali used in glass-making has been described as potash though it was generally if not always soda, and the presence or absence of cobalt as a blue colour for glass and as a pigment has been asserted and denied without any chemical evidence. Most of the archæologists who have made really valuable progress have paid attention to the assistance which can be given by chemistry, and in future it may be assumed that the services of the chemist will be called in even more extensively than in the past.

IN the *Empire Review* for August, the problem of the mentally defective is raised again. It is a problem which is always with us, but which for that very reason is likely to be overlooked. Discussions on the subject usually resolve themselves into heated opposition to all the suggested schemes for dealing with the defective, or into a fatalistic resignation to the futility of all schemes. Miss Nelly Burdett pleads for the reanimation of public interest in the subject, which shall lead to more earnest efforts to put these people into such a position that they can be useful members of their own society, since by their defect they are debarred from adapting adequately to general society. She points out the disquieting fact that with our present system of half-hearted treatment, the ranks of the mentally defective are being increased. In 1906 it was estimated that one person in every 250 was mentally defective. Now it is one in every 200. A Royal Commission appointed in 1904, after four years' work, made recommendations which have not yet been realised. A point of considerable interest, not dealt with in this article, is that emotional conflict may mask itself in some form of mental defect, and much later trouble could be spared by suitable treatment and understanding from the beginning.

AT the conference on Illuminating Engineering held at the British Empire Exhibition on August 12, a paper was read by Mr. L. Gaster summarising developments at the International Conference on Industrial Hygiene, and the meeting of the International Illumination Commission recently held in Geneva. The former afforded a good opportunity of interesting experts on hygiene in illumination, and the importance of good industrial lighting in the interests of the

health and safety of workers was freely recognised. It was suggested that the International Illumination Commission should bring before the International Labour Bureau of the League of Nations problems in industrial lighting, etc., with a view to their being studied by the Governments of the respective countries. Industrial lighting also formed the subject of much discussion by members of the International Illumination Commission. A feature of interest is the large number of scientific and industrial bodies which co-operate with the American Illuminating Engineering Society in the revision of their codes of school and factory lighting. Arrangements have been made for the National Research Council to supervise researches on the results of better lighting. These facts were mentioned to illustrate the desire for co-operation in the United States and the recognition by manufacturers and gas and electricity supply undertakings that researches, in order to carry weight with the public, must bear the impress of scientific and impartial authority. After describing the methods adopted in America for promoting public appreciation of the benefits of good lighting, Mr. Gaster urged the need for a comprehensive scheme in Great Britain, in which all interested in illumination could join. A resolution approving the proposal of the Illuminating Engineering Society to initiate such a scheme was passed unanimously. A paper on "Illumination of Highways from the Motorists' Point of View" was read by Mr. E. H. Fryer, and there was also an interesting discussion on the methods of lighting adopted at the British Empire Exhibition.

A FULL report of the International Meteorological Conference of Directors and of the meeting of the International Meteorological Committee at Utrecht, September 1923, an account of which appeared in *NATURE* of October 6, 1923, p. 523, has recently been issued as Publication No. 112 of the Koninklijk Nederlandsch Meteorologisch Instituut. The volume consists of 191 pages. At the meeting in London, September 1921, it was arranged that the next meeting should be held at Utrecht. The president was Sir Napier Shaw, and the assembly represented 20 countries, including, in addition to Europe, Argentine, Brazil, India, Japan, and New Zealand. There was a very copious agenda, the rapid progress of meteorology of late years rendering international understandings and arrangements essential to its further advancement. Land and marine meteorology over the whole globe were considered as well as upper air observations, and the general collection and distribution of obtained results. The Appendices give a large amount of information, considered internationally, and afford much material for quiet study. The discussion includes terrestrial magnetism and electricity of the atmosphere, solar and terrestrial radiation. Special consideration is given to the exploration of the upper air, the arrangement of dates for international ascents of pilot-balloons and balloons sondes, and a time-table of issues by radiotelegraphy in connexion with weather telegraphy and weather forecasting. The subjects include marine meteorology with its important considerations of world-wide interest, reseau mondial, agricultural

meteorology, the propagation of sound by means of explosions, and the study of clouds. These international meetings lead to essential uniformity in methods of observation and discussion and aid much in the extension of observations for land and sea areas. For weather forecasting and for considerations of physical meteorology on land or sea as well as in the air above the surface of the globe, trustworthy and comparable data are available—the aims and objects being arranged by personal contact among those interested and responsible for the world's meteorology.

THE *Chemiker Zeitung* announces that Prof. W. J. de Haas, of Groningen, has been appointed to succeed Prof. H. Kamerlingh Onnes, of Leyden, who has resigned.

At the annual autumn meeting of the Institute of Metals to be held in London on September 8-11, Mr. W. M. Corse, of the National Research Council, Washington, D.C., will lecture on "Recent Developments in Non-Ferrous Metallurgy in the United States, with Special Reference to Nickel and Aluminium-Bronze." Visitors' tickets for the meeting can be obtained from the Secretary of the Institute, Mr. G. Shaw Scott, 36-38 Victoria Street, Westminster.

At the monthly General Meeting of the Zoological Society of London held on August 13 it was reported that the number of visitors to the Society's gardens during the month of July had been 266,559, showing an increase of 85,538 as compared with the corresponding month last year. The total number of visitors to the Gardens since January 1 had been 1,079,608, an increase of 249,239. The number of visitors to the Society's aquarium since its opening on April 4 had been 316,347.

A SURVEY of the Great Barrier Reef area has been undertaken by the Commonwealth Government of Australia, and the naval sloop *Geranium* has been detailed for the work. The vessel will have a seaplane attached for general help and work in the survey, and a preliminary flight around the coastline of Australia was recently completed with the view of deciding the kind of assistance which can best be afforded from observations in the air. The commander of the *Geranium* is a member of the Barrier Reef Committee of the University of Queensland, and he will take with him two scientific investigators attached to the Committee.

A PRIZE for the physiology and pathology of altitude has been founded by the Alpine Sanatorium of Semmering, Austria. One thousand gold krone are offered to the author of the best work accomplished or published in the last two years, which has extended our knowledge of the action of alpine climate on man. The prize is intended in the first instance for Austrians, but foreigners can also be considered if their work has been carried out in Austria. Printed or typed papers should reach the Kanzlei of the Akademie der Wissenschaften, Wien I., Universitätsplatz 2, before December 31, 1924. Some notable English reports both from the Andes and the Himalaya deserve to be laid before the commission of judges, even if they may have to be marked not for competition.

THE communications of the Society of German Men of Science and Physicians—*Gesellschaft Deutscher Naturforscher und Ärzte*—are now distributed monthly with *Die Naturwissenschaften*. The *Mitteilungen* give general information about the Society. Subscriptions have been reduced to a minimum of three marks; those who can are asked to give more. The 88th meeting is to be held at Innsbruck, Austria (Sept. 21-27). The president-elect, Dr. Richard Paltauf, professor of pathology in Vienna, died on April 21. Some of the chief addresses at Innsbruck will be by Dr. Hoche on the body-mind problem, Dr. Hess on the physiology of work, Dr. Frisch on the senses and language of bees, Dr. Sommerfeld on atomic researches, Dr. Penck on the aspect of the Alps. Those intending to take part in the Innsbruck meeting should communicate with Prof. D. A. Defant, Büro der Naturforscher Versammlung, Physik. Institut, Schöpfstr. 41, Innsbruck.

THE Castner-Kellner Alkali Co., Ltd., has issued recently a number of informative pamphlets dealing with some of the chemical products which it manufactures. Among these is sodium perborate, which is used for bleaching textiles, oils, fats, waxes, and foodstuffs. In the solid state this substance is quite stable, but on solution in water it yields hydrogen peroxide, caustic soda, and borax, the last named acting as a water-softener. The formation of caustic

soda might be harmful, but can be readily obviated by adding sodium phosphate or bicarbonate, or a pure mineral acid. The pamphlet entitled "Chlorine and Chlorine Products in relation to Public Health" describes the manifold applications of liquid chlorine, bleaching powder, and sodium hypochlorite. Liquid chlorine is being used increasingly for sterilising potable water, and it is not generally known that a large proportion of the London water supply is now treated with this substance in the ratio of 0.5 part of gaseous chlorine to one million of water, whereby the water is improved bacteriologically about one thousand times. It is well known that diseases may be contracted from the water in public swimming-baths; 1-3 parts of chloride of lime per million of water, applied every 1-2 days, will effectually sterilise the water. Other applications are for sterilising canal or river water before use in condensers at power-stations, and for disinfecting streets, sewage, the farm and the kennel. A third pamphlet contains, *inter alia*, directions for using bleaching powder, calcium hypochlorite and sodium hypochlorite solutions to bleach textiles (other than wool), artificial silk, and paper pulp, with or without previous scouring with alkali and a solvent such as trichloroethylene. Bleaching agents containing chlorine are now in use for bleaching and desulphurising mineral oil, and for converting unsaturated hydrocarbons in such oil into saturated hydrocarbons.

### Our Astronomical Column.

THE PERSEIDS OF 1924.—Mr. W. F. Denning writes: "From observations made at various stations, it appears that the shower has been less abundant than usual. On the important night of August 11, the weather was unfavourable and only enabled a few meteors to be seen through breaks in the clouds. At Ashby, Lincolnshire, Mr. King, watching occasionally a partially overcast sky between 10<sup>h</sup> 29<sup>m</sup> and 13<sup>h</sup> 58<sup>m</sup> G.M.T., saw 28 meteors, of which 19 were Perseids, from a radiant well defined at 46° + 57°. At 13<sup>h</sup> 20<sup>h</sup> 1/2<sup>m</sup> a splendid Perseid several times brighter than Venus was observed shooting from 30° + 52<sup>h</sup> 1/2° to 26° + 50<sup>h</sup> 1/2°. A brilliant Perseid was also seen from Warwick Road, London, S.W., and from Greenwich, S.E., on August 12 at 9<sup>h</sup> 42<sup>m</sup> G.M.T. It was about three times as bright as Venus and left a luminous trail for about ten seconds. The direction of the flight was from  $\alpha$  Ursæ Majoris towards  $\alpha$  Comæ Berenicis, so that the object was evidently a very fine Perseid. Further observations of the two large meteors referred to above would be valuable."

AN ANTI-RELATIVITY THEORY.—Articles in the July and August numbers of *Scientia* by Prof. La Rosa contain a daring suggestion as to the cause of variability in stars, including the outburst of Novæ. Few are likely to accept the author's suggestion as a *vera causa*, but the articles are worth reading as a study of the consequences that would follow from his assumptions as to the laws governing the speed of light.

Prof. La Rosa rejects not only the Einstein postulate as to the constancy of the measured speed of light, but also the previous postulate that the speed is conditioned by the medium conveying the light-waves. In fact, he reverts to the corpuscular theory, supposing that the speed of the corpuscles is the resultant between the speed of the luminous body and that of the emission of corpuscles. Taking, for example, a

star moving with a speed of 60 miles per second in a circular orbit the plane of which passes through the sun, the difference between the speeds of emission at the two elongations is 1/1500 of that of light, and if the time between the elongations were (say) 2 months, and the star 250 light-years from the sun, the light emitted at the two elongations would reach us simultaneously. There would thus be a rhythmic increase and diminution in the amount of light received during the revolution. Novæ are explained by supposing very eccentric orbits of cometary form so arranged as to give a great concentration of light in the neighbourhood of perihelion.

PROPER MOTIONS OF THE HYADES.—Memoir No. 35 of the Kapteyn Laboratory at Groningen, by the Director, Prof. van Rhijn, deals with the proper motions of the Hyades stars, based on photographs taken at Helsingfors. It contains a full discussion of the measures and reductions and a catalogue of 395 proper motions. The final mean annual proper motion of the cluster is given as 0.102" in Position Angle 102°. It is not difficult to separate the cluster stars from the non-cluster ones by their motion; this appears clearly when the motions are plotted as a series of dots the abscissæ and ordinates of which indicate the motion in  $x$ ,  $y$  respectively.

The density of non-cluster stars is found to be somewhat less than in other regions of the same galactic latitude, and it is noted that the same peculiarity has been found in other cluster regions. We may conjecture that the cluster stars are surrounded by dust-bearing regions, which absorb some of the light of stars in the background. The presence of such dust round the Pleiades stars is shown by their accompanying nebulae, the spectra of which appear to indicate that they are dust-clouds reflecting the star light.