

Current Topics and Events.

It is of interest to recall that the date November 23 marks the 260th anniversary of the publication in 1664 of that rare and notable folio by Robert Hooke, entitled "Micrographia: or some Physiological Descriptions of Minute Bodies made by Magnifying Glasses, with Observations and Inquiries thereupon." The issue was licensed by Viscount Brouncker, P.R.S. Hooke, who was born in 1635, at Freshwater, Isle of Wight, died in 1703. He was associated in intimate fashion with the early founders of the Royal Society—Moray, Wren, Boyle, Evelyn, and others—and worked with amazing industry to promote its aims. The lineaments of this remarkable man have not been bequeathed to posterity, since no authentic portrait of him exists. Sir Robert Moray had originally suggested Hooke, in 1662, as a curator of experiments to the Royal Society, putting it that "Mr. Hooke should come and sit amongst them," but it was not until November 23, 1664, that the president was desired to declare to the whole Society that the council thought good to have a curator by office, and Dr. Wilkins was deputed to submit that "Mr. Hooke standing for a curator's place be this afternoon nominated." Robert Boyle was thanked for dispensing with his services, in favour of the Society.

THE "Micrographia" contains a dedication to the King, this subscribing to the current flamboyant style. "There are, Sir" (Hooke says) "several other of your Subjects, of your Royal Society, now busie about Nobler Matters: The Improvement of Manufactures and Agriculture, the Increase of Commerce, the Advantages of Navigation: In all which they are assisted by your Majestie's Incouragement and Example. Amidst all those greater Designs, I have presumed to bring in that which is more proportionable to the smalness of my Abilities, and to offer some of the least of all visible things, to that Mighty King that has established an Empire over the best of all Invisible things of the World, the Minds of Men." The Royal Society is given a special dedication, Hooke informing them that "the Rules you have prescrib'd yourselves in your Philosophical Progress do seem the best that have ever yet been practis'd. And particularly that of avoiding Dogmatizing." A long and somewhat drawn-out preface to the reader follows. Of Wren and Wilkins, Hooke has much to say in eulogy and evident friendship. There scarce ever met, he affirms, in one man (Wren) so great a perfection, such a mechanical hand, and so philosophical a mind.

BORROWING the title of a world-known story, "A Tale of Two Cities," Mr. H. S. Pritchett discusses in the November issue of *Scribner's Magazine* the application and function of Benjamin Franklin's trust for the cities of Boston and Philadelphia, the provisions of which were set forth in a codicil to his will made some eight months prior to his death. The recent celebration of the centenary of the Franklin Institute of Philadelphia gives the article special

point. The detailed information respecting Franklin's philanthropic foundation is, indeed, welcome and timely. Needless to say, two other cities hold Franklin in honoured remembrance. He lived in London eleven years, was elected a fellow of the Royal Society, and served on its council. The Society would take no fees from him. The Paris National Assembly wore a badge of mourning for three days after his death; Condorcet pronounced a eulogy before the Academy of Sciences. Franklin's design was to benefit Boston and Philadelphia through the creation of a money trust for each, which, however, contained at the same time a hard and fast plan, operative for one hundred years, with a contingent second centennial period. He wished to form the mind of youth and conduce to the material prosperity of youth; also to encourage the projection of works of public utility of such nature as might lead to the comfort and convenience of the inhabitants of the cities named. Without stretch of imagination he would seem to have preceded Mr. Carnegie and Mr. Rockefeller. The story of these bequests, their limitations, the difficulties encountered in their administration, and, not least, the economic and social changes which have affected them, form, in the hands of Mr. Pritchett, an interesting record, throwing as they do much light upon the question of the institution, management, and obligations which arise therefrom.

ELECTRIC supply authorities are sometimes required to give a supply of electricity to districts at a great distance from the generating station, although the probable demand is small. In these cases it does not pay them to erect a manually operated substation, and a completely automatic substation is too expensive. Mr. Chattock, the electrical engineer to Birmingham, deserves great credit for doing valuable pioneering work with small automatic substations equipped with mercury vapour rectifiers of the glass-bulb type. This apparatus statically transforms alternating current into direct current. When a mercury arc exists in a vacuum under certain temperature conditions, it acts like a valve, allowing current to flow through it in one direction and not in the other. The cathode bath of mercury is the positive pole of the direct-current circuit. If the vacuum fail for any reason, then a violent short circuit occurs, but luckily this rarely happens. In a paper read to the Institution of Electrical Engineers on November 20, Mr. Rogers stated that in the case of glass bulbs for 230 volts, no single instance in his experience of a short circuit has occurred. This paper will be of immediate value to engineers, as not only are the arrangements for the automatic control of these rectifiers given in full, but also schedules of the complete costs of rectifier substations. A method is given in the appendix of supplying direct current at 550 volts to a six-mile length of double tramway track by means of semi-automatic rectifier substations. The method is both simple and cheap, and probably will have applications in the immediate future.

THE decision of the editors of the *Irish Naturalist* to cease publication of this journal with the December number will be learned with deep regret by the many readers in Great Britain and elsewhere who have followed the admirable work done by the magazine in promoting the study of the fauna of Ireland for a period of thirty-three years. It has been unable to recover from the vicissitudes due to the War, and increased costs of production, with the loss by death or otherwise of a large body of its former supporters, have combined to render continued publication impossible. An author index to the last eight volumes, on the same lines as that for the first twenty-five, will be issued with the concluding number of the current volume. A subject index and title index to the whole series is contemplated if sufficient financial support is forthcoming.

THE remarkable and well-known collection of stone implements and other Irish antiquities formed by Mr. W. J. Knowles of Flixton Place, Ballymena, Ireland, was sold by auction at Sotheby's on November 17 and three following days, the total amount realised being 400*l.* The more important stone implements were purchased for the Belfast Museum, including a fine kite-shaped lance-head of flint found between Bellaghy and Castle Dawson (25*l.*), one of gray flint polished on both sides, 6 inches long, from Tyhorney (25*l.*), a spear-head of elongated kite-form, 7½ inches, from Carndon (10*l.*), chipped axe of basalt, 13 inches long, found at Armooy (10*l.*). Several of these implements were figured in the *Journal of the Royal Anthropological Institute*, vol. xxxiii. The Ashmolean Museum obtained two rare pieces—a cauldron of thin sheet bronze formed of four riveted plates found near Portglenoue (50*l.*), and a heart-shaped bronze fibula with triangular plate of the second century A.D. (17*l.* 10*s.*). A Celtic quadrangular iron bell with clapper fell to Belfast Museum (25*l.*).

FEW educational organisations have done more valuable work than has the School Nature Study Union, which celebrated its coming of age in September last. Founded in 1903 by a small band of enthusiasts, of whom the leaders were Miss Kate Hall and the Rev. Claude Hinscliff, with the primary object of bringing a breath of the country into the drear and drab lives of the children of the London slums, it has grown into a large and vigorous organisation permeating the educational system of the whole of England, endeavouring to foster in children a real love of the natural world around them, an appreciation of its beauty, and an interest in its manifold workings. The special anniversary number of its official organ, *School Nature Study*, issued to commemorate its coming of age, contains much interesting matter on various aspects of nature study, and a review of the growth of the Union and of the work that has been accomplished. Three articles deserve special notice. Prof. J. Arthur Thomson has rewritten his pamphlet on "The True Inwardness of Nature Study," and, in its revised form, it is worthy of the close attention of all who desire to see an extended system of biological

teaching put into practice. It is a clear and reasoned statement of the objects, methods, difficulties, and potentialities of nature study, and embodies the ideals of the Union for which it was written.

THE other two articles in this anniversary issue of *School Nature Study*, by the president of the Union, Dr. Chalmers Mitchell, on "Observation and Theory," and Prof. J. B. Farmer on "Teleology in Nature," bear on the same problem and also contain timely warning against one of the greatest dangers of nature study in inexperienced hands, namely, the attempt to interpret the facts observed, the tendency to warp the powers of observation through the influence of preconceived theories, and the interpretation of animal and plant behaviour on anthropomorphic lines. Dr. Chalmers Mitchell deals with the general problem; Prof. Farmer is concerned mainly with the dangers of teleology, the appeal to design or purpose as an explanation of structure or behaviour. For these friendly warnings, so timely given, the Union and its supporters should be grateful. We join in the many congratulations which the Union has received on this special anniversary of its foundation. With the ideals before it so high, with the enthusiasm of its executive so keen and whole-hearted, and with a growing volume of support from biologists on one hand and educationists on the other, the Union in its maturity should bring to fruition the seeds so diligently sown in its infancy and adolescence.

A CHADWICK public lecture on "Smoke: its Cause, Nature, Effects and Methods of Prevention" was delivered by Prof. J. B. Cohen on Wednesday, November 19. Prof. Cohen stated that soot from factory chimneys is very different in character from that from domestic fireplaces where raw coal is burnt. In the former case, owing to the high temperature and strong draught, the volatile portions of the coal are mainly consumed, whilst the draught carries off mechanically fine mineral dust and grit mixed with carbon containing little tar. Domestic soot, on the other hand, may contain as much as a quarter of its weight of tar. It is this tar which causes the soot to cling, accumulating with time and blackening surfaces with a varnish which is not removed by rain. Vegetation suffers in several ways from the presence of smoke. If the light is partially cut off by the pall of smoke, or if the leaf (more especially of evergreens) is blackened by a coating of soot, or again if the stomata are blocked with tar, the plant must suffer. Again, the plant is affected by the acid soot, and also by the sulphur acids which pass into the air from burning coal and are washed down by rain. The effect of this acid is to corrode the leaf, which withers and falls much earlier in and near a town than in the country. Moreover, the acid percolating through the soil destroys certain organisms and enzymes concerned in the assimilation of the soil constituents, and many grasses, vegetables and flowering plants succumb. Even the colour of flowers is affected. The observations of Sir Frank Baines have also made it evident that the sulphur acids from coal attack masonry, while fabrics,

leather bindings and metal work are being similarly attacked. Passing to remedial measures, Prof. Cohen stated that in his opinion the situation could be much improved by the production of cheaper gas, coke, and electricity, while local authorities should encourage their sale and exercise to the full their powers under the Public Health Act of 1875 to stop unnecessary smoke from boiler chimneys.

THE opening meeting of the Illuminating Engineering Society on November 18 was, by custom, devoted to reports of progress and the exhibition of novelties. Mr. Leon Gaster in his opening address remarked that the vacation had been a period of exceptional activity. Illumination had been dealt with at the World Power Conference, the meetings of the International Illumination Commission and the International Conference on Industrial Hygiene in Geneva, and at the Conference afterwards arranged by the Society at the British Empire Exhibition. At Geneva an excellent opportunity of interesting hygienists in lighting problems had been presented, and good lighting is now definitely accepted as an element indispensable for health, safety, and efficiency. Developments abroad had been rapid, and in the present year an Illuminating Engineering Society had been formed in Austria. A report presented by the Committee on Progress in Electric Lamps and Lighting Appliances directed attention to the steady advance towards higher values of illumination, and quoted examples of the general tendency to utilise light in a more scientific manner. The exhibits after the meeting as usual covered a wide range, including new reflectors and luminous signs, and a motor-car headlight specially designed to overcome the dazzle difficulty. Mr. W. G. Raffe dealt with the psychology of illumination, and Miss Mary Wurm gave an address on stage lighting in connexion with music, illustrating her remarks by experiences in various Continental theatres.

IN the unavoidable absence of Lord Weir, Mr. H. B. Weeks presided at the third annual meeting of the Cast Iron Research Association in London on November 19. The chairman laid stress on the great progress made during the year, and summarised the main developments, referring particularly to the extended research programme and the establishment of a laboratory. Sir John Dewrance was elected president of the Association for the period 1924-26, and the following were elected vice-presidents: Mr. Geo. Pate (Falkirk), Mr. Summers Hunter (Wallsend-on-Tyne), Mr. F. W. Firth (Sheffield), Mr. C. E. Lloyd (Dudley), and Mr. W. B. M. Jackson (Chesterfield). Commander C. W. Craven and Prof. T. Turner were re-elected vice-presidents. A great tribute was paid to the services rendered to the Association by the retiring president, the Rt. Hon. Lord Weir of Eastwood, who was elected an honorary member. Mr. A. J. Burn, Mr. F. J. Cook, Mr. T. Donaldson, Mr. N. B. Ellington, Mr. J. Haigh, Major C. Howl, and Mr. M. Riddell were re-elected to the council. Dr. W. Rosenhain and Prof. T. Turner were elected honorary members, and Dr. Rosenhain spoke, expressing the hope that there would be even greater co-

operation in future between the Association and the Ferrous Alloys Research Committee. Delegates nominated by the leading technical institutions were also elected at the meeting.

THE next Congress of the Royal Sanitary Institute and Health Exhibition will be held at Edinburgh on July 20-25, 1925, by invitation of the Magistrates and City Council.

THE following have been elected officers of the Cambridge Philosophical Society for the session 1924-1925: *President*, Prof. J. T. Wilson; *Vice-Presidents*, Prof. J. Barcroft, Mr. C. T. Heycock, Dr. G. T. Bennett; *Treasurer*, Mr. F. A. Potts; *Secretaries*, Dr. F. W. Aston, Mr. J. Gray, Mr. F. P. White; *New Members of the Council*, Dr. A. B. Appleton, Dr. C. D. Ellis, Mr. F. F. Blackman, Mr. C. T. R. Wilson, Mr. J. E. Littlewood, Mr. G. Udny Yule, Prof. E. A. Milne.

THE *Chemiker Zeitung* reports that Prof. F. Paschen, formerly director of the Physical Institute of the University of Tübingen, was installed on November 1 as president of the Physikalisch-Technische Anstalt, Berlin. The same issue also records the appointment of Herr Geheimrat Wiedfeldt, German Ambassador to Washington, to the head of the directorate of the firm of Krupp in Essen-Ruhr. Dr. Bruhn retires from the board of directors, in order to become the representative of Krupps in Berlin, in succession to Dr. Kurt Sorge, who has resigned.

A NEW expedition to the Arctic is being planned by Mr. Lauge Koch, the Danish explorer. According to the *Geographical Journal* for November, the objects will be mainly geographical and cartographical, and the field of work will be Grant Land and other islands of Arctic Canada, where Mr. Koch proposes to investigate and map the mountain range which he believes to be a continuation of those he explored in Northern Greenland and a section of a great arc that continues through Spitsbergen, the Shetlands, Scotland, and Wales. No date for the departure of the expedition has yet been fixed.

THE Royal Geographical Society, in conjunction with the University of London, has arranged a meeting of a special character to be held at the Central Hall, Westminster, on December 1. M. Albert Kahn, who is already well known for the establishment of the Albert Kahn Travelling Fellowships and similar works for the promotion of international comity, is sending to the meeting a number of photographs taken in natural colours by his direction in various parts of the world. These will be projected on a screen in four groups illustrating European scenery, the relation of environment to man, modern architecture, and China, and will be described by Mr. A. Ogilvie, Mr. L. H. Dudley-Buxton, Mr. E. A. Benians, and Prof. P. M. Roxby, all of whom have held Albert Kahn Travelling Fellowships.

WE learn from *Science* that an Institute of Research has been established by Lehigh University, Bethlehem, Pennsylvania, "to encourage and promote scientific

research and scholarly achievement in every division of learning represented in the organisation of the university; and in recognition of the need for further and more exact knowledge in science and in the applications of science to the affairs of modern life." The Institute will be controlled by an executive board including heads of the faculties of Lehigh University, and it is hoped to afford training in research methods to the staff of the University and the Institute, to graduate students of the former, and to special investigators. The New Jersey Zinc Company has already founded a research fellowship in science and technology in the new Institute. Bulletins or reports on the progress made in problems attacked will be issued from time to time.

MESSRS. Dulau and Co., Ltd., 34 Margaret Street, W.1, have just circulated their Catalogue No. 119, giving the titles of some 1400 second-hand books and serials relating to astronomy, dialling, meteorology, aviation, physics and chemistry, mathematics and mechanics, and fen drainage, which they have for sale.

THE Cambridge University Press announce for early publication "A History of British Earth-

quakes," by Dr. C. Davison, the aim of which is to record all known British earthquakes, to trace the zones in which crust-changes have recently occurred and in which the faults are yet alive, and to discover some of the laws that rule the growth of faults.

THE Cantor Lectures on "Colloid Chemistry," which were given by Dr. E. K. Rideal at the beginning of the year, have been published in three recent numbers of the Journal of the Royal Society of Arts (Oct. 17, 24, and 31). Dr. Rideal's review included such topics as adsorption, methods of preparation, stability of sols, emulsions, soaps, etc., practical applications of the features discussed being frequently given.

THE Oxford University Press will publish at the beginning of December a limited edition of "The History of Aeronautics in Great Britain from the earliest period to the latter half of the Nineteenth Century," by J. E. Hodgson. The work will include chapters on the development of international aeronautics, an annotated list of papers read before the Aeronautical (now the Royal Aeronautical) Society between 1866-93, and a selected bibliography.

Our Astronomical Column.

A STUDY OF STELLAR MOTIONS.—The *Scientific Monthly* for November contains an interesting analysis of stellar velocities by Dr. Gustaf Strömberg. He forms *velocity surfaces* for different groups of stars by imagining the bodies forming a group to start from a common point at the same instant; then after moving each with their proper speed for the selected unit of time, the curve or surface drawn through them gives a graphic representation of the velocity distribution.

These surfaces in most cases are considerably elongated not only in sections perpendicular to the galactic plane (which we might foresee *a priori*) but in the galactic plane itself. This is so far in accord with Schwarzschild's ellipsoidal hypothesis, but a considerable deviation from such a symmetrical form is found, which is especially notable when stars of high velocity, more than 100 km./sec., are examined. They are found to be practically all moving towards one hemisphere. A similar want of symmetry is found in many other distant objects.

The author gives a tentative explanation, supposing that some fundamental system of reference exists in space, and that high velocities relatively to it are far more rare than small velocities. He gives an illustration; supposing a ship moving rapidly through the air, then various classes of objects on deck are variously affected by the strong draught produced, some moving with the ship, others keeping their position in the air, while others have intermediate motions. If several ships are postulated, a close resemblance to the observed stellar motions would arise. The paper closes with some discussion on the bearings of these results on Einstein's general theory of relativity.

MARTIAN PHOTOGRAPHY.—Two very interesting series of Martian photographs are reproduced and discussed in the October number of Publications of the Astronomical Society of the Pacific. The first, by W. H. Wright, deals with photographs taken with the Crossley reflector at the Lick Observatory in light of three different wave-lengths, (1) ultra-violet, (2) yellow, and (3) infra-red. (1) shows no detail on

the disc except the polar cap, and gives a distinctly larger image than the others; (2) agrees with the visual aspect of the planet; (3) shows the dusky regions in an accentuated manner, the polar cap being small and faint. (1) is thought to give a picture of the Martian atmosphere, extending 120 miles above the limb (this is supported by some recent observations of the occultation of Mars, a glow being seen for a few seconds after the disappearance of the disc). It is concluded that the polar cap is mainly an atmospheric phenomenon, but that there is probably a less conspicuous surface cap below it. The darkness of the dusky areas in (3) indicates that their radiations are mainly in the blue and green, agreeing with their visual aspect. Terrestrial landscapes taken from Mt. Hamilton with (1) and (3) show that the distant landscape is wholly blotted out in (1) by the atmospheric veil, while it is clearly visible in (3).

The second series was made by Prof. E. C. Slipher at Flagstaff, with the 24-inch refractor and the 40-inch reflector. The tests with light of different wave-lengths are in full accord with those of Mr. Wright. The pictures are grouped in a manner to bring out the seasonal changes, the dusky areas darkening in the late spring and fading in the autumn; this is in full accord with the vegetation hypothesis. On the whole, these markings and the polar cap have repeated the cycle of change recorded in 1909, the region Deucalion being, however, fainter this year.

Search was made, without success, for the chlorophyll bands in the spectrum of the dusky areas. It is noted that it is much more difficult to detect these in reflected light than in transmitted light.

Prof. R. Trumpler also publishes some simultaneous drawings and photographs made with the 36-inch Lick refractor. The drawings show numerous canals, including some in the dusky areas; traces of several of these can be seen in the photographic reproductions, and the original negatives are stated to show many more. The polar cap had some dark bands across it, and detached white patches at its edges. A small white spot is shown in the middle of Auroræ Sinus not very far from "Dawes Ice Island."