News and Views.

ON Saturday, November 27, the authorities of the town and cathedral of St. Albans will commemorate the six hundredth anniversary of the election of a prelate famous in the history of the Abbey—Richard of Wallingford, Abbot 1326–1335. This fact has interest for men of science and archæologists, for Wallingford was a scientific pioneer, as well as a distinguished abbot. At Oxford, where he was a student and doctor in the 'Hall' maintained by the leading Benedictine houses for the reception of promising youths from their local schools, he won fame as a mechanician and astronomer, almost as a magician. In this he shared the lot of 'Friar Bacon,' whose follower, though not immediate pupil, he was; it seems that that pioneer genius started what might have been a great school of science at the university. Wallingford was the author of scientific treatises, one of which, "The Rectangulus," survives in MS. to this day. Many of the scientific instruments he invented are preserved, either actually or as reproductions, in the Ashmolean Museum, and were the basis on which later men could work. His scientific *chef d'œuvre*, however, was the astronomical device 'Albion' ('all by one'), which showed "the action of the tides and the revolutions of the planets."

THE above commemoration will be attended by Sir Frank Dyson (the Astronomer Royal), Prof. H. H. Turner, Dr. R. T. Gunther, and other scientific men (including representatives of the Clockmakers' Company), and will take the form of a service in the Abbey of St. Albans at 4 P.M., at which a wreath will be placed on Wallingford's tomb, and his prayers used. Later, there will be a gathering in the Town Hall, when papers will be read on Wallingford's work as man of science and abbot, and there will be a small exhibition of his scientific instruments. It is hoped that this will include the actual instrument 'Albion,' for it was acquired from the Royal Commissioners at the time of the dissolution of the abbey, by a local 'Squire,' and it has ever since been an heirloom in his family. The instruments will be explained by Dr. Gunther. The service and gathering are, naturally, public, and any one desiring more information on the matter should apply to the Hon. Secretary, Wallingford Commemoration, Kingsbury Knoll, Verulam Road, St. Albans.

ACCORDING to a recent message of the Stockholm correspondent of the *Times*, the following awards of Nobel prizes have been made: The reserved prize for physics for 1925 between Prof. J. Franck of Göttingen and Prof. Hertz of Halle; the prize for physics for 1926 to Prof. Jean Perrin; the prize for chemistry for 1925 to Prof. Richard Zsigmondy; the prize for chemistry for 1926 to Prof. The Svedberg. Prof. Franck is professor of physics and director of the physical laboratory in the University of Göttingen and is the author of many papers on atomic structure, ionisation by collision, and related topics. Prof. Perrin is professor of physical chemistry at the Sorbonne; he is the author of a standard work on atomic chemistry which has passed through many editions and has been translated into French and German. He was elected a foreign member of the Royal Society in 1918. Profs. Zsigmondy and Svedberg are both best known for their work on the colloidal state. Prof. Zsigmondy is professor of inorganic chemistry in the University of Göttingen; he has worked largely on the gold sols, and his book on colloids and the ultra-microscope has been translated into English. A recent volume, "Das Kolloide Gold," by Prof. Zsigmondy and P. A. Thiessen, is the first of a new series of monographs in which the scattered work on the physics and chemistry of colloids is being brought together under Prof. Zsigmondy's guidance. Prof. Svedberg, professor of physical chemistry at the University of Upsala, has carried out numerous and fundamental researches on colloidal solutions of the suspensoid type and has made noteworthy contributions to our knowledge of the chemistry of photographic processes.

AT a luncheon given on November 12 by the Imperial College of Tropical Agriculture to the Dominion Prime Ministers and representatives, Mr. Amery made the important announcement that 96,000*l.* out of the 100,000*l.* which Lord Milner set out to obtain as an endowment fund for the College has now been raised. Sir Arthur Shipley, who presided, pointed out the great need there is for agriculturists who have been thoroughly trained in tropical agriculture; men of this type are wanted everywhere, and it is this want that the Trinidad College is hoping gradually to satisfy. One of the difficulties is that there is not at present a sufficient supply of schoolboys with any biological training. Sir Arthur deplored the fact that it is now possible for a student to take honours in a Natural Science Tripos at Cambridge without taking at least one biological subject. At the present moment the market for chemists and engineers is gravely overstocked, whereas there is an appalling dearth of entomologists and mycologists. This state of affairs the College is endeavouring to redress. Both Mr. Bruce, the Prime Minister of Australia, and Mr. Coates, the Prime Minister of New Zealand, stated that they took the greatest interest in the College, although neither was able to make any immediate promise to provide funds for its enlargement.

IT is doubtless true that the number of fatal flying accidents to service flying officers this year—more than seventy to date—large as it is, is in diminishing ratio to the number of hours flown as compared with previous years since the War. It is probably true also that many of the accidents which occur are due to errors of judgment on the part of the pilots. The number of accidents is sufficiently large, however, to occasion concern and to re-emphasise the need for more and more research in connexion with the design and construction of aircraft, and obviously for the exercise of more care in the selection of pilots and more care in their training. Whether the private aircraft construction companies should be granted subsidies with which to carry out their own research programmes, the suggestion made by Mr. Handley Page

in his letter published in the *Times* on November 12, or whether it would be better for the Royal Aircraft Establishment to undertake aircraft construction as well as design, is a debatable question. It is obvious that Great Britain, however favourably it compares with other countries as regards accidents, has still to carry out much research work before a type of aircraft is evolved which will combine stability with manœuvring capacity. There is still much work to be done in connexion with the elimination of the possibility of fire on 'crashing,' and other safety precautions. There is little doubt that every aeroplane accident, whether it is a service machine or a commercial machine involved, shakes the confidence of potential passengers in the safety of air travel and reacts unfavourably against the development of commercial air services.

ON November 23, the centenary occurs of the death of Johann Elert Bode, the famous German astronomer. Born at a time when scientific studies in Germany were recovering from the set-back brought about by the disastrous Thirty Years' War, Bode was the first to diffuse a general taste for astronomy among his fellow-countrymen. He was the Lalande of Germany, and his name is known to every one as the author of "Bode's Law." That law, it is true, is to be found in the writings of Titius, Wolf, and others, but it was Bode who first directed attention to it. His world-wide reputation, however, rested on other grounds. The son of a schoolmaster, and born in Hamburg, January 19, 1747, Bode at the age of twenty-one years published a popular treatise on astronomy and an essay on the transit of Venus of 1769. Three years later Frederick the Great made him astronomer to the Berlin Academy of Sciences, in which position he did much to stimulate astronomical studies. His well-known "Astronomische Jahrbücher" were commenced in 1774; two years later he published an essay on the constitution of the sun, and in 1778 made known the law bearing his name. He closely followed Herschel's newly discovered planet, and it was he who named it Uranus when Herschel would have called it Georgium Sidus. His "Uranographia," or Great Celestial Atlas, appeared in 1807 and contained observations of about 17,000 stars. Long regarded as the head of German astronomers, he was younger than Mayer, but among his contemporaries were such as Harding, Gauss, Schumacher, Struve, and Encke.

THE opinion among engineers of the value of a training in the scientific principles of the profession has altered greatly during the past twenty years, and there are few, even among the older school of engineers, who do not now recognise the advantages of such a training. But although few subjects have been more widely discussed, there are still wide differences of opinion as to how, when, and where such a training is best obtained, and as to exactly what it should include. Should it be obtained at a technical school in evening classes, or in a full-time course at a university? Should it precede, be carried on simultaneously with, or follow a course of practical training in works or office? Should the university attempt anything in the nature of practical training? How long should the period of practical training last? In a paper read at a meeting of the North-East Coast Institution of Engineers and Shipbuilders on October 29, Principal Sir Theodore Morison, of Armstrong College, Newcastle, suggested the formation of a committee of the Institution with the view of giving an authoritative answer to these and other cognate questions.

THE outcome of Sir Theodore Morison's suggestion will be of interest, and we look forward to a report of the discussion of the paper. Numerous committees of engineers have considered the subject in the past in Great Britain and other countries, without by any means exhausting its possibilities. Since the report of the committee of the Institution of Civil Engineers on engineering education some years ago, the scope of engineering has in many respects changed, and the ideal scheme of fifteen years ago is not of necessity best fitted to satisfy to-day's requirements. Such a committee has recently been considering the subject in the United States of America. Perhaps the most interesting part of its report is the general insistence on the importance of cultural subjects, and of a thorough grounding in the general physical principles of engineering. The idea of specialising until a late period of the course, and even then of too pronounced specialisation, is in general deprecated. We are of the opinion that this is a very sound view. We believe that the majority of the engineering schools of the universities of Great Britain do aim at giving this sound fundamental training. At the same time, provision should be made at certain selected universities for highly specialised courses of post-graduate standing. At the moment, this would appear to be the weakest part of the university training of engineers in England. Such a committee as the one suggested might well consider what courses of this nature might most usefully be instituted.

IT seems probable that in the immediate future the development of electricity supply in Ireland will rapidly increase. At present it is more backward in this respect than any country in Europe. The consumption in Northern Ireland is 43 units per head of the population, and in the Free State only 16 units per head. This compares with a consumption of 2500 units in Norway, 900 in Switzerland, and 140 in Britain. In his presidential address to the Irish section of the Institution of Electrical Engineers, Mr. Kettle, the city electrical engineer to Dublin, took a favourable view of the future of electricity supply in Ireland. He said that the Shannon scheme is not mainly a 'power' scheme. It is more a 'transmission' scheme comparable to the Swiss Central Board arrangement and the British Government scheme. He admitted, however, that the promoters of the Shannon scheme seem to anticipate that it will be a commercial success from its commencement—an altogether too sanguine view to adopt. The Free State has anticipated the ordinary course of events

by about ten years, but having put its hand to the plough it cannot turn back. The country has been definitely committed to the scheme, and the fullest co-operation with other schemes is necessary in order to make it a success. A second Shannon Power Bill is apparently expected in the near future and it will probably deal with the supply and control of the entire electricity supply of the Irish Free State. A transmission scheme has been outlined for Northern Ireland, but the authorities there appear to be disposed to proceed more gradually than those of the Free State. There is not much difference between the two schemes except that one would use coal and the other water power. Mr. Kettle thinks that both networks should be so designed that they can be combined to form an all-Ireland scheme at a future date.

THE story of Clerk Maxwell has hitherto been mainly confined to biographical details of his life and general career. As, however, it is now nearly fifty years since he died, it is possible to see how much his work has influenced the development not only of physics but also of applied engineering. In particular, every radio expert claims him as one of the great pioneers of electrical communication because of the invaluable help his electromagnetic theory of light has been in the development of their art. In the October issue of *Electrical Communication* Mr. Rollo Appleyard begins a series of articles on the pioneers of electrical communication by an eloquent eulogy of Maxwell. In 1856 Maxwell accepted a professorship at Aberdeen. In 1860 he became a professor at King's College, London, and in 1871 he became professor of experimental physics at the Cavendish Laboratory, Cambridge. It has to be remembered that from 1851 to 1865 very rapid progress had been made in submarine telegraphy, and many data in connexion with electrical phenomena had been collected which Maxwell had to interpret from the theoretical point of view. His great paper on the "Dynamical Theory of the Electromagnetic Field" was published in 1865. On this paper the electrician has built his practical theory of the working of the alternating current transformer and much of the modern theory of electrical communication. Maxwell admitted electricity to the rank of a physical quantity, but he warned us against assuming too hastily that it was either matter or a form of energy. He considered that it was proved that electricity could not be annihilated and that it could not be created. He has left us a memory of individual thought and achievement which has rarely been rivalled in the history of the world.

PROF. A. P. LAURIE delivered a lecture to the students of the Royal Academy, London, on Wednesday, November 10, on "The Theory of Colour and its Application to Painting." Modern pictures in oil vary frequently and lower considerably in tone in the course of years. One cause of this is the yellowing of the oil, and an investigation was undertaken to see whether some other cause was not also present. Pigments may be regarded as translucent particles of varying refractive index, and the light received from their surface will consist partly of light reflected from the first surface struck by the ray of light, and partly by light transmitted through the pigment, and then reflected. The first reflection will consist principally of white light. The ratio between the reflected and the transmitted ray varies according to a somewhat complex formula with the difference between the refractive index of the medium in which the pigment is ground and that of the pigment itself. Thus, if the refractive index of a linseed-oil film increases with age, the result will be gradually to lower the tone of the pigment ground in it. Experiments have shown that in nine months the change is sufficient to affect the opacity of white lead and the tint of cadmium yellow. A rough table was then prepared of the principal bright pigments used by artists, these pigments being arranged in the order of transparency by examination in media of higher and higher refractive index and also in their spectrum order, so as to enable artists to pick out those least affected by the two changes taking place in linseed oil. These experiments throw new light on the methods of oil painting in the fifteenth and sixteenth centuries; the painters of that time were evidently experimentally aware of both of these properties of linseed oil and based their technique upon these facts with the view of keeping up the colour key of their pictures.

THE thirteenth Thomas Hawksley Lecture was delivered at the Institution of Mechanical Engineers on November 5 by Prof. E. G. Coker, the subject chosen by the lecturer being "Elasticity and Plasticity." After a brief historical introduction, Prof. Coker described the advances which have been made in recent years in the science and technique of photo-elasticity. An interesting feature of this part of the lecture was the description of the apparatus now used for measuring the applied load, which depends upon the elastic deformation of a steel ring loaded diametrally. Photo-elastic methods are employed to determine the most suitable form of ring, and a mechanical multiplying device fixed within the ring serves to record visually the diametral extensions. Prof. Coker then outlined the mathematical theory of photo-elasticity, in regard to the determination of the principal stresses both by direct measurement of the lateral strains, and by Filon's development of Clerk Maxwell's method of integration along the lines of principal stress, using as an illustration of the latter the dovetailed joint used for steam turbine blades. Dealing next with the subject of elastic breakdown, Prof. Coker described the various attempts which have been made to discover a law governing failure under all systems of stress, and referred particularly to those involving combinations of the single criteria proposed by Rankine, St. Venant, and Guest, and to the strain energy theory of Haigh and its modification by von Mises. A most interesting portion of the lecture was devoted to the subject of plasticity, the researches of Prandtl, Hencky, and Nadai being brought under review, particularly in their application to the phenomena associated with the pressure of a die in a steel plate. The manner in which the soap film method used by

Griffiths and Taylor for the determination of stress distribution in torsion can be extended to the case of plastic strain was described, and the lecture concluded with a review of the present state of knowledge regarding the application of optical methods to the determination of plastic stresses.

MR. P. A. BUXTON, of the London School of Tropical Medicine, to whose researches in the New Hebrides reference was made in the article on West African Development which appeared in NATURE of November 6, writes to correct a rather important misapprehension of his conclusions regarding the relation between malaria and abortion. In commenting on the omission in Mr. Ormsby Gore's report of any reference to Mr. Buxton's important memoir on "The Depopulation of the New Hebrides," the statement was made that "it seems fairly well established from the recent researches of Mr. Buxton in Melanesia that malaria is one of the principal determining causes of abortion and still-births." This was based on the statements on page 425, vol. 19, *Trans. Roy. Soc. Trop. Med. Hyg.*, to the effect that "abortion is common in all the islands of Melanesia"; the probability "that methods of obtaining abortion, which have been known [to the natives] from time immemorial, have been used more and more frequently within the last half-century," partly due to increasing monogamy, the outcome of the white missionary's zeal; and the supposition "that unprovoked abortion is common in the New Hebrides, owing to the malaria, and therefore any procedure which is adopted to produce abortion will occasionally be followed by the desired result, even if it is intrinsically harmless." Too much has been read into this last statement, for Mr. Buxton writes: "My conclusions may be summarised thus: malaria and the practice of abortion (not abortion caused by malaria) are both concerned in the disappearance of these peoples. But I have never showed, or tried to show, that malaria caused enough abortions to make it a factor in the depopulation, and it seems improbable that this is so, for the depopulation is an event of the last century and the malaria is an indigenous disease.'

REFERRING to our note in the issue of November 13, p. 708, on the distances at which the 'concentration shoot' off Portland on October 30 was heard, Prof. A. E. Boycott writes stating that the firing was heard very clearly in the open near Aldenham, Hertfordshire, about 125 miles from Portland, and was mistaken at first for thunder. There was a fairly strong north wind blowing. Dr. R. T. Gunther, 5 Folly Bridge, Oxford, states that the firing was distinctly heard on the towing-path near Oxford and it also caused the windows of his house to rattle. Oxford is about 110 miles from Portland.

IN the issue of *Science* for October 1 there is a short but interesting contribution from Dr. Edgar F. Smith on Priestley's life in America, whence he withdrew in 1794 from the animosity to which his religious views had given rise in England. Priestley's daily life in his adopted home is briefly described, and his manifold activities summarised. Persecution followed him across the Atlantic, mainly on account of the anonymous attacks on him which are stated to have been written by William Cobbett, "an Englishman whose pen, dipped in gall, spared the venerable scientist in no wise." He was, however, a friend of American divines. Priestley's advanced views on education are compared with those of Herbert Spencer, and the article is a sympathetic account of a man who has not, perhaps, had the credit paid to him which is his due.

IT is announced in *Science* that the John Fritz Gold Medal of the American Societies of Civil, Mining and Metallurgical, Mechanical and Electrical Engineers for 1927 has been awarded to Elmer Ambrose Sperry, of New York, for the development of the gyrocompass and the application of the gyroscope to the stabilisation of ships and aeroplanes.

AT the annual general meeting of the Cambridge Philosophical Society, the following officers were elected for the session 1926–27: *President*, Dr. H. Lamb; *Vice-Presidents*, Mr. G. Udny Yule, Prof. J. T. Wilson, Prof. A. Hutchinson; *Treasurer*, Mr. F. A. Potts; *Secretaries*, Mr. F. P. White, Mr. R. H. Fowler, Mr. H. Munro Fox; *New Members of Council*, Prof. T. M. Lowry, Dr. H. Jeffreys, Dr. F. J. W. Roughton, Mr. F. T. Brooks.

IT is now announced that the Proceedings of the Optical Convention, 1926, held at the Imperial College of Science and Technology, South Kensington, on April 12–17 last, will be ready in the first week of December. The book is in two cloth-bound and fully illustrated quarto volumes, each of more than 500 pages, and contains the presidential address and the papers read at the Convention, with a full report of the discussions thereon. The address of the Secretary of the Optical Convention is 1 Lowther Gardens, Exhibition Road, London, S.W.7.

A NATIONAL Coal Products, Chemical, and Engineering Exhibition, arranged by the Manchester Section of the Society of Chemical Industry with the assistance of Provincial Exhibitions, Ltd., was opened at the City Hall, Manchester, on November 16 and will remain open until November 27. Scientific exhibits have been obtained from the fuel departments of the universities of the north of England, from the Fuel Research Board, and from the Lancashire and Cheshire Coal Research Association, and there are models, diagrams, and photographs of special interest to those engaged in the mining and utilisation of coal. In connexion with the Exhibition, a Conference on Tar will be held on November 26; three sessions have been arranged, the chairmen of which are Prof. A. Smithells, chairman of the Fuel Section of the Society of Chemical Industry; Mr. T. Glover, president of the Institution of Gas Engineers; and Mr. E. Escott Wood, president of the Coke Oven Managers' Association.

THE Smithsonian Institution of Washington announces the dispatch of a botanical exploring expedition to Colombia under the leadership of Mr. E. P. Killip. Starting from Cartagena, the expedition will follow the valley of the Magdalena River to

Puerto Vilches and then cross over to Bucaramanga and Pamplona near the Venezuelan frontier. The expedition forms part of the programme decided on in 1917 by the Smithsonian Institution, the New York Botanical Garden, and the University of Harvard, for the systematic exploration of the four north-western states of South America, and continues the work begun in 1922 by Mr. Killip in the country around Buenaventura.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—Two laboratory assistants at the Low Temperature Research Station, Cambridge—The Superintendent, Low Temperature Research Station, Downing Street, Cambridge (November 27). An assistant in mycology in the Pathological Laboratory, Harpenden, of the Ministry of Agriculture and Fisheries—The Secretary to the Ministry, 10 Whitehall Place, S.W.1 (November 29). A lecturer in chemistry at Armstrong College, Newcastle-upon-Tyne—The Registrar (December 1). Chemists, physical chemists and physicists for work under the Research Association of British Paint, Colour and Varnish Manufacturers—The Director of the Association, 8 St. Martin's Place, W.C.2 (December 2). An assistant lecturer in organic chemistry in the University of Leeds—The Registrar (December 6). A demonstrator in mathematics at the Royal College of Science, South Kensington—The Secretary, Imperial College of Science and Technology, South Kensington, S.W.7 (December 7). A professor of anatomy in the University of Lucknow—The Registrar (December 31). A principal of the Denbighshire Technical Institute—The Secretary and Director of Education, Education Offices, Ruthin (December 31). A lapidary (male) for the Department of Mines, Ottawa, Canada—The Secretary, Civil Service Commission, Ottawa, Canada (January 6). A professor of physiology in the University of the Witwatersrand, Johannesburg—The Secretary, Office of the High Commissioner for the Union of South Africa, Trafalgar Square, W.C.2 (January 31). A principal of the University College of Wales, Aberystwyth—General Secretary of the College (January 31). A lecturer in geography at the Bedford Training College—The Principal, The Crescent, Bedford. A lecturer in mathematics in the Gordon College, Khartoum—The Controller, Sudan Government London Office, Wellington House, Buckingham Gate, S.W.1 (marked "Lecturer").

Our Astronomical Column.

COMET COMAS SOLA.—This comet is 1926 *f*, being the sixth to be detected during the year; but four of the six, also Neujmin's Comet, 1926 *g*, were periodic comets observed on their return to perihelion. Mr. G. Merton has photographed the new comet on two nights, and Mr. B. M. Peek sends the following notes on its physical appearance. With a 12-inch mirror, power 200, the diameter of the nebulosity is 1′ using averted vision. Direct vision shows a coma of 15″ diameter, and a stellar nucleus of 12 mag., the total light being fully 11 mag.

Herr Ebell has deduced the following orbit, which is still uncertain owing to the distance of the comet and its slow motion:

T	1927, May 14·333 U.T.
ω	62° 48′
Ω	57 15
i	24 57
log q	0·24405

EPHEMERIS FOR 0h U.T.

	R.A.	N. Decl.	log r.	log Δ.
Nov. 21	2h 40m 25s	7° 36′	0·4437	0·2614
29	2 32 25	8 19	0·4326	0·2548
Dec. 7	2 25 6	9 11	0·4213	0·2518
15	2 19 8	10 13	0·4097	0·2528

The comet is well placed for observation, being on the meridian before midnight. It is likely to become an easy telescopic object during December.

MODERN ASTRONOMY.—The July issue of *Natural History*, the journal of the American Museum of Natural History (vol. 26, No. 4), is an attractive number devoted entirely to astronomy. Prof. S. A. Mitchell (Director of Leander M'Cormick Observatory) writes on total solar eclipses, of which he has seen six, involving journeys of 50,000 miles in all. The three latest American eclipses of 1918, 1923, 1925 are described in great detail. That of 1923 had the best weather prospects, but the least successful results. Beautiful coloured reproductions of these three eclipses, by Mr. Howard Russell Butler, are given. He describes his method of working in the second article. He notes that there are three factors of colour—brightness or value, prismatic hue, saturation. He makes rapid outline sketches, indicating in shorthand the values of these factors for each region, and works the picture up from these, using photographs to improve the outlines. He also reproduces a coloured picture of a lunar crater lit by a low sun. The sunlit portion is nearly white, with various faint tints. The part in shadow, lit by the sunlit walls and by the earth, varies from greenish brown to brown. The gibbous earth is shown, the ocean being blue, polar regions and solar reflection white, clouds and land light brown; the sky is dead black and star-studded.

Prof. G. E. Hale writes on solar tornadoes. He gives some beautiful spectroheliograms of prominences, filaments, and vortices, describing the paddle apparatus he has invented for imitating the latter. He mentions the curious change in polarity of sunspots at the beginning of new cycles, but points out that the change is not shared by the high-level hydrogen vortices, which seem to follow the same law of rotation as terrestrial storms. Incidentally, he refers to stars using their energy to build up the atom from electrons and protons. Inasmuch as other physicists are relying on the stars deriving their energy from the atom, to explain the immense duration of their life as suns, there would seem to be need of co-ordination, so that astronomers may not be liable to the accusation of forgetting the conservation of energy, and trying both to "eat their cake and have it."

W. J. Luyten writes on "island universes." He takes the recently adopted distances (ranging from a million light years) as fully established, and studies their size, etc., on this basis. He dates the "era of island universes" from Lord Rosse's discovery in 1845 of the great spiral nebula in Canes Venatici; but surely Sir William Herschel is entitled to the pioneer honours. Many of his estimates of the size and distance of these objects were of the same order as those adopted to-day.