Friday, August 28.—L, South Stoneham House, (garden party); E, Portsdown Anticline; G, Southampton Waterworks at Otterbourne; C, Bournemouth.

Saturday, August 29.—C, Isle of Wight (whole day); D, Beaulieu via Southampton Water and the Solent (whole day); K, Meon Valley and Portsdown (whole day); H, Salisbury and Stonehenge (whole day); M, Sparsholt Farm Institute (whole day).

Sunday, August 30.—C, Lulworth Cove (whole day); K, New Forest (whole day); L, Winchester.

Monday, August 31.—D, Hayling Island; E, Northern Part of the New Forest; G, Calshot Aerodromes and the Agwi Petrol Works at Fawley; I, Antigas School at Tipnor; K (Forestry Subsection), Durley Saw Mills (Messrs. F. Houghton, Ltd.); B, Holton Heath Cordite Factory.

Tuesday, September 1.—D, New Forest; G, Railway Works at Eastleigh; G, Supermarine Aviation Works, Southampton; G, Avro Works at the Hamble; K, Hurst Castle; M, Fruit Farm, Botley; I, Fort Grange Aerodrome, Gosport; C, Hordle and Barton.

The evening discourse will be given by Mr. R. V. Southwell on "Aeronautical Problems of the Past and of the Future," at 8 P.M., in the Central Hall, on Friday, August 28. Citizens' lectures have been arranged as follows:

(1) Major A. G. Church, on Thursday at 7.30 P.M., on "Science and the East African Commission" at the Central Hall; (2) Prof. E. V. Appleton, on Saturday at 8 P.M. at the Avenue Hall, on "The Rôle of the Atmosphere in Wireless Telegraphy"; (3) Capt. P. P. Eckersley, on Monday at 8 P.M. at the Central Hall, on "Some Technical Problems of Broadcasting"; (4) Mr. C. J. P. Cave, on Tuesday at 8 P.M. at the Central Hall, on "The Highway of the Air."

Lectures for Young People at the Central Hall are arranged as under:

(1) Dr. F. A. Dixey, on Saturday at 3 P.M., on "Mimicry in Relation to Geographical Distribution"; (2) Mr. W. H. Barker, on Monday at 3 P.M., on "The Development of Southampton in Relation to World Commerce"; (3) Prof. W. J. Dakin, on Tuesday at 3 P.M., on "Whaling in the Southern Ocean."

W. RAE SHERRIFFS.

Current Topics and Events.

PROF. J. G. MCKENDRICK, F.R.S., the distinguished emeritus professor of physiology in the University of Glasgow, reached the age of eighty-four years on August 12; Sir William Tilden, F.R.S., eminent as a chemist, celebrates his eighty-third birthday on August 15. The former was born at Aberdeen and educated there at the University. For thirty years he was professor of physiology in the University of Glasgow; he was sometime Fullerian professor of physiology at the Royal Institution and president of Section I (Physiology) of the British Association. At the Oxford meeting, in 1894, of the British Association, he exhibited and demonstrated a working model intended to illustrate the mechanism of the cochlea. With Dewar and Ramsay he conducted researches on the physiological action of the chinoline and pyridine bases. Sir William Tilden, a Londoner, was a science master at Clifton College, 1872–80, leaving to take up the chair of chemistry at Mason College, Birmingham, a post which he held for fourteen years. On leaving Birmingham he became professor of chemistry at the Royal College of Science, London, retiring in 1909. He was awarded the Davy medal of the Royal Society in 1908. In organic chemistry he has made highly important researches on the terpenes, for example, on the hydrocarbons from *Pinus sylvestris*, and on terpin and terpinol. Author of many scientific memoirs, he has also published several well-known chemical manuals.

THE report of the Electricity Commissioners in Great Britain for the year 1924-1925, which has just been published, is of considerable interest. In public supply undertakings the output for the year is 7415 million units, which is an increase of about 16 per cent. on the output of the preceding year. In private plants the output would probably be about half as much. The increased output has been obtained at an appreciably higher efficiency. Last year the average coal rate per unit generated was 2·53 lb. In the two preceding years it was 2·67 and 2·78 lb. respectively. This steady progress is satisfactory but there is plenty of scope for improvement. The new Barton station at Manchester shows the highest efficiency, namely, 1·51 lb. of coal per unit generated, and its thermal efficiency is practically twenty per cent. The coal consumption at the gas producer stations ranges from 1·81 to 3·69 lb. per unit generated, the average being 2·60 lb. per unit. The largest Diesel engine oil-driven station (1940 kilowatts) has a thermal efficiency of 26·6 per cent. For small stations internal combustion engines are the most efficient. Water power only contributes about 0·7 per cent. of the total supply of electricity in Great Britain. Several large plants are now being constructed, but the total possible water power is, unfortunately, small.

THE transmission of photographs by means of telephone circuits has recently been perfected to so great a degree that the picture as received is practically a perfect reproduction of the original and shows no signs of the process of transmission. The principle of the method is well known, namely, two cylinders, one at each end of the circuit, rotating synchronously and moving axially so that a spiral line 0·01 in. wide is made to cover the surface dealt with. The sending cylinder has within it a photo-electric cell; the photograph in the form of a transparency or film is attached to the transparent surface of the cylinder, and a small spot of light falls upon the photograph so that the illumination of the photo-electric cell and the current produced are proportioned by the density of the photograph. The current produced is too feeble for transmission, therefore it is amplified, and then, by means of a vacuum tube modulator, imposed on a high frequency carrier current. At the receiving end the current passes through a narrow flat conductor which covers a small hole and is deflected by the current,

opening the hole more or less according to the strength of the current. Light passes through this hole and impinges upon a sensitive film carried on the surface of the rotating cylinder. The exposed film is developed as usual. Mr. Mervyn Thompson states (*British Journal of Photography*, July 24, 439) that a 7 × 5 inch photograph is transmitted in 7½ minutes irrespective of the distance, which may be, for example, from San Francisco to New York, which is more than three thousand miles.

DR. S. E. SHEPPARD, of the Eastman Kodak Company's Research Laboratory, has succeeded in identifying the constituent of gelatine that enables it to confer the extraordinary sensitiveness on silver bromide in the modern photographic dry plate, and gives an account of his work in the Royal Photographic Society's Journal for August. Four emulsions prepared by the same method but with different gelatines were found to be almost identical except in sensitiveness, the fastest being about nine times as fast as the slowest. Evidently some gelatines are much more "photographically active" than others. Mr. R. F. Punnett found that an extract might be prepared from an "active" gelatine, which, when added to a relatively inert gelatine, rendered it active, and the question was to find this active ingredient. It was found that the acid deliming liquors used in the preparation of gelatine contained it, and several thousand gallons were treated for its extraction. "Gelatine-X," as Dr. Sheppard calls it, was found also in many plant materials, especially in black mustard seeds. It was now closely identified with either allyl mustard oil or allyl sulphide. Tests of various allyl compounds showed that the sensitising power was not due to the allyl group, though "gelatine-X" was finally proved to be allyl isothiocyanate (allyl mustard oil) or allyl thiourea. Active gelatines were found to contain about one part of the organic compound in from 300,000 to 1,000,000 parts of gelatine. It is this substance that produces the sensitivity centres, that is, the points where development starts, in the particles of silver bromide, and these sensitivity centres consist of silver sulphide, though allyl sulphide itself was found to be inactive. Certain selenium and tellurium compounds are effective sensitisers and give sensitivity centres that consist of silver selenide and telluride. Further details of this important discovery are to be published later.

IN our issue of March 7, p. 346, a note appears which deprecates the too sanguine statements made by politicians about the possible economies that can be effected by erecting very large electric generating stations. To illustrate this we quoted with approval several statements made by S. S. Wyer in a report published by the Smithsonian Institution of Washington, in which a comparison is made between the systems adopted on the Canadian and on the American side of the Niagara Falls. We also quoted a statement made by Mr. Wyer that the service in Ontario is not taxed, so that the lowering of the cost to the consumer is done at the expense of the tax-payers of the districts in which the property is located. Naturally we thought that a statement of this gravity would not be made in a publication of the Smithsonian Institution unless all the facts of the case were known and had been studied. We have received a letter from Sir Adam Beck, the Chairman of the Hydro-Electric Power Commission of Canada, dated July 20, in which he states that Mr. Wyer's assertion is unfounded. He also sends us a pamphlet entitled "Misstatements and Misrepresentations derogatory to the Hydro-Electric Power Commission of Ontario contained in a report published by the Smithsonian Institution entitled 'Niagara Falls: its Power Possibilities and Preservation,' under the authorship of Samuel S. Wyer, examined and refuted by Sir Adam Beck.", He states categorically that the Power Commission pays taxes both to municipalities and to the Provincial Government to the extent of hundreds of thousands of dollars annually.

THE Soviet authorities issue a Weekly News Bulletin of the U.S.S.R. Society of Cultural Relations with Foreign Countries, and a recent issue suggests great activity. Active preparations are being made to celebrate the bicentenary of the Russian Academy of Science on September 5-14 in Leningrad and Moscow. According to the programme which has been issued, the celebrations will commence on the evening of September 5 with a reception in the rooms of the Academy of Science at Leningrad. On September 6 there is to be a meeting in the grand hall of the Academy, followed in the evening by a banquet. The morning of September 7 is to be devoted to visits to the scientific institutes of the Academy, while on the following day the observatory at Pulkovo and other institutions around Leningrad will be inspected. On September 9 the Soviet Government will receive the delegates. After further visits and festivities the delegates will leave on September 10 for Moscow, arriving the next day in time for a reception at the Institute of Physics. September 12-13 will be devoted to a meeting at the Conservatoire and to visits to the museums at the Kremlin and to scientific institutes in Moscow. The celebrations conclude on September 14 with a luncheon given by the "Maison des Savants." In connexion with the celebrations, the authorities are issuing the unpublished works of Lyapunov on mathematics and physics, the syntaxis of Shakhmatov, and the Osset dictionary of Miller, which should be a very valuable publication. It is a matter for regret that there must be scores of other important works and papers, which have been lying in manuscript for years, for want of funds. The Bulletin referred to above gives some quite interesting brief outlines of archæological work in various parts of Russia, and states that a number of scientific expeditions are being sent to some of the lesser known parts of the country.

WE have received a long letter from Dr. C. G. S. Sandberg in reference to the notice of his book, "Geodynamische Probleme," in NATURE of May 23, p. 791. He wishes it made clear that the pressures which, according to his view, produce earth movements, are not and cannot be lateral, but are hydrostatic, as

they are due to vapour tension. He remarks that Alpine and other similar folding has, according to his theory, been caused by vapour tension hydrostatic pressure, which, finding relief in the directions of least resistance, convey the impression of having been brought about by lateral tangential pressure. Dr. Sandberg also remarks that the diagram from Lugeon, which was reproduced in his book, was inserted to demonstrate the inseparable relation between tectonic structure and metamorphism; and the remark in the review that such diagrams, whatever may be the ultimate cause of the pressure, indicate that the actual movements are due to lateral compression, is an argument of the reviewer's, and not of Dr. Sandberg. Dr. Sandberg also points out that he does not deny some contraction in the earth as a whole, but emphatically rejects the so-called contraction theory.

THE sixty-second annual meeting of the British Pharmaceutical Conference was held in Glasgow on July 27-30. In his address, entitled "Recent and Coming Developments in British Pharmacy," the chairman, Mr. E. White, dealt with the present and future problems of pharmacy both on the educational and administrative side. He gave some account of the proposals of the Pharmaceutical Society to found a laboratory for the physiological testing of drugs, and emphasised the need for such a laboratory. He also referred to the results achieved in the recent deliberations of the International Federation at Lausanne. In speaking of proprietary medicines, Mr. White said that this had been discussed at the Lausanne Conference, and gave it as his opinion that legislation on this subject would not be long delayed; he considered that the Pharmaceutical Society must take an active part in the initiation of such legislation. Mr. White then spoke of the meeting of the International Conference to be held in Brussels in September, when the standardisation of potent drugs will be considered, and referred to the great advantage to be gained by an international agreement on certain cardinal points in the practice of pharmacy. Mr. White said he believed that a serious effort to unify pharmacy in the English-speaking communities would yield encouraging results. In the Science Section of the Conference, nineteen papers were communicated. Among these were papers on the picrates of the opium alkaloids, on the identification of alkaloids and of drugs containing tannins, on the chemical examination of the oleo-resin of Indian valerian root, and on West Australian sandal-wood oil.

AT a recent meeting of persons interested in the Peking Union Medical College, which is financed by the China Medical Board of the Rockefeller Foundation, an organisation called the Yu Wang Fu Association was formed. It was decided that the purpose of the Association shall be, by frequent informal meetings, to stimulate good fellowship and to continue and increase interest in the welfare of the College in those who have at any time or in any capacity worked in Peking in connexion with it, and have now entered other pursuits. Dr. Franklin C. McLean, the organiser and first Director of the College, was elected president, Dr. E. V. Cowdry, secretary-treasurer, with Dr. A. B. Macallum, Dr. Charles Packard, and Dr. Donald D. Van Slyke, members of the council. It is intended to establish branches of the Association, of which New York is the headquarters, wherever such may be justified, but particularly in Chicago, San Francisco, London, Tokyo, and Shanghai. The first meeting of the Association will be held at the Marine Biological Laboratory, Woods Hole, Massachusetts, on August 1, when an address will be delivered by the secretary of the Rockefeller Foundation, Mr. Edwin R. Embree. Those wishing to join the Association are requested to communicate with Dr. E. V. Cowdry, at the Rockefeller Institute, 66th St. and Avenue A, New York.

ON July 12 a new Geophysical Observatory at Jakutsk ($\phi = 62° 01'$, $\lambda = 129° 43'$ from Greenwich) commenced work. Organised by the Geophysical Central Observatory, Leningrad, the new observatory represents a local branch of the Central Observatory and consists meanwhile of two sections, dealing with meteorological and the aerological work respectively. It is expected that in due course the observatory will be equipped for actinometric, optical, and magnetic observations.

SIR CHARLES S. SHERRINGTON, Waynflete professor of physiology in the University of Oxford, has been appointed a member of the Medical Research Council as from September 30 next. The vacancy is caused by the retirement of Dr. Henry Head, who leaves the Council under the provisions of the Royal Charter governing the rotation of membership.

THE Council of the Royal Meteorological Society has awarded the Howard Prize for 1925 to Cadet H. W. Barnett of S.A.T.S. *General Botha*, South Africa, for the best essay on "Icebergs: their Distribution and Drift."

THE following committee has been appointed "to advise as to the proper scope of the Broadcasting Service and as to the management, control, and finance thereof, after the expiry of the existing licence on December 31, 1926": The Earl of Crawford and Balcarres (chairman), Lord Rayleigh, Lord Blanesburgh, The Right Hon. Ian Macpherson, The Right Hon. W. Graham, Sir Thomas Royden, Dame Meriel Talbot, Sir Henry Hadow, Captain Fraser, Mr. Rudyard Kipling, with Mr. W. E. Weston, of the General Post Office, as Secretary.

ON Monday, August 10, the national memorial to Capt. R. F. Scott and his four companions who died on the return journey from the South Pole early in 1912, was unveiled on Mount Wise, Devonport. A memorial fund was opened in 1913 by the Lord Mayor of London, and the response has been so generous that, in addition to the memorial at Devonport, a large sum has been set apart to augment Government provision for the sustenance of the families of the deceased men, the outstanding liabilities of the expedition have been discharged, a considerable sum

put aside for the publication of the scientific results obtained, and an institute for polar research has been established at Cambridge. The memorial takes the form of a granite pylon surmounted by a symbolic group in bronze with portrait medallions of Capt. Scott and his four comrades below.

WE learn from *Science* that Dr. Raymond Pearl has been appointed director of an Institute for Biological Research established by the Rockefeller Foundation, through its Division of Studies, at the Johns Hopkins University, Baltimore. Dr. Pearl will retain a connexion with the department of biometry and vital statistics of the School of Hygiene, as research professor in this subject, and will continue as professor of biology in the Medical School. The whole time of the staff of the new Institute will be devoted to research on general problems of biology, but with especial attention to the biology of life duration and its control, and to the experimental study of the population problem. Dr. Lowell J. Reed has been made professor of biometry and vital statistics and head of the department in the School of Hygiene at Johns Hopkins.

THOSE interested in cinematography will read with interest, and doubtless with profit, a communication by Dr. K. C. D. Hickman to the Royal Photographic Society on "Colour Vision and the Design of Kiné Theatres," which is published in the July issue of the Society's Journal. He gives no new experimental results, but brings together many physical and physiological facts and discusses their effects on practical results.

AT the end of a review entitled "Industrial Research in Cotton" (NATURE, August 1, p. 164) it was stated that the volume under notice, the Shirley Institute Memoirs, is not purchasable. We now learn that bound copies of the Memoirs can be obtained, price one guinea, from the secretary of the British Cotton Industry Research Association, Shirley Institute, Didsbury, by non-members of the Association.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned: A lecturer in transport in the University of Birmingham—The Secretary (August 20). A lecturer in the department of electrical engineering of the Bradford Technical College—The Principal (August 29). A professor of education at Armstrong College—The Registrar, Armstrong College, Newcastle-upon-Tyne (September 8). A professor of civil engineering 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 (September 14). A lecturer in bacteriology in the University of Birmingham—The Secretary (September 26). A second laboratory assistant in the department of Biochemistry, Oxford—The Department of Biochemistry, University Museum, Oxford. An assistant bacteriologist at the Wellcome Tropical Research Laboratories, Khartoum—The Director, Wellcome Tropical Research Laboratories, c/o The Controller, Sudan Government, London Office, Wellington House, Buckingham Gate, S.W.1. A half-time demonstrator in botany in McGill University, Montreal—The Secretary.

Our Astronomical Column.

PHOTOMETRIC METHODS APPLIED TO VARIABLE STARS.—Dr. W. J. S. Lockyer, Director of the Norman Lockyer Observatory, Sidmouth, has recently contributed a very interesting study of the interesting star ϕ Persei ("The Spectrum of ϕ Persei, Type BoPe," Monthly Notices, R.A.S., 85, 580, May 1925). The principal feature of the spectrum is the composite nature of the hydrogen lines and of the ionised lines of several metals, of which iron is the most prominent. For example, H_β consists of a broad absorption band on which is superposed a bright emission band of lesser width, on which, again, is superposed a sharp absorption line. The ionised metallic lines, however, do not show the broad absorption band associated with the hydrogen lines. From observations, made more than twenty years ago, on the cyclical positional changes of the absorption lines, the star was recognised as a spectroscopic binary with a period of 126½ days. Lockyer's recent observations refer more particularly to the components of the bright emission bands—of H_β, for example. The relative intensities of the two components were measured by the wedge method, employed in the determination of spectroscopic parallaxes. In this way, cyclical changes were detected, and the resultant period found by Lockyer agrees precisely with the period derived from various line-of-sight investigations.

It would appear that this is the first occasion on which the periodicity of a star has been determined by the wedge method. There are indications, in addition, that, superimposed on the 126½ day period, there is a subsidiary period of 21 days; further observations would appear to be necessary to establish this definitely and more precisely. An interesting suggestion from Lockyer's paper is that ϕ Persei should be a variable star of period 126½ days, and it is hoped, by means of photometric observations, to test this suggestion in the near future.

NEW STAR ATLAS, SHOWING FAINT STARS.—Mr. Max Beyer, in conjunction with Prof. K. Graff, of Bergedorf, is bringing out a very useful set of star maps, including all stars down to magnitude 9·3 and fainter ones if meridian places are available. The first 12 sheets are now ready; they comprise the equatorial zone from $+22°$ to $-23°$; each sheet covers 2 hours of R.A., the scale being 1 cm. to a degree. The epoch is 1855, but as centennial precession is marked at six points on each map, reduction to other epochs is easy. Nebulæ and star clusters are marked with crosses. There is no lettering or nomenclature on the maps themselves, but stars can be quickly identified by their co-ordinates. A slight blemish is the absence of indication of variability. Thus Mira Ceti is shown as an ordinary star of the sixth magnitude (its mean value). These maps should be of great assistance in finding comets and minor planets, or in recognising variables or Novæ. The price of the 12 sheets is only 15 marks—little more than a shilling a sheet—and a reduction of twenty per cent. is made to those purchasing three sets. The whole sky north of Decl. $-23°$ will be completed in 30 charts. The scale is of course less than that of the Bonn maps, but it is sufficient for the identification of objects.