

sent to the authorities of the college or university of which the candidate is, or has been, a member, and must reach the Secretary by Feb. 8, 1932. Further information can be obtained from the Secretary, Commonwealth Fund Fellowships, 35 Portman Square, London, W.1.

### Calendar of Geographical Exploration.

Jan. 1, 1841.—The Antarctic and the Ice-Barrier.

Under the direction of Capt. J. Clark Ross, R.N., an expedition consisting of two ships, the *Erebus* and the *Terror*, crossed the antarctic circle to prosecute surveys for the British Government. From the point of view of geographical discovery, this was the most fruitful of all antarctic voyages. Ross was an experienced arctic traveller and had located the north magnetic pole in 1831. Under his direction, ships for the first time deliberately pushed their way into the pack ice. This ice, previously thought to stretch on indefinitely to the remote land, proved to be a belt about a hundred miles wide, and the *Erebus* and *Terror* passed through it to open waters now known as Ross Sea. By Jan. 11, Ross had sighted the rocky coast of South Victoria Land and had noted the Admiralty Range running north-west along the coast, and a further range going southwards. Unable to reach the mainland, he landed on Possession Island and claimed the newly discovered land for Britain. Later he sighted an active and an extinct volcano, named respectively *Erebus* and *Terror* after the vessels. The great ice barrier, with peaks 200 ft.-300 ft. in height and extending for 250 miles, seen for the first time, checked his farther southward progress. Like the Frenchman, Dumont d'Urville, who had set out from Hobart on Jan. 1 of the previous year, he was compelled to give up the dream of reaching the south magnetic pole, though he penetrated nearer to it than any previous explorer.

Sixty-one years later, on Jan. 1, 1902, the *Discovery*, with Lieut. R. F. Scott, R.N., as its commander, and with E. H. Shackleton, R.N.R., as one of its lieutenants, met the pack ice and thence penetrated to Ross Sea. The ice-barrier had retreated 30 miles since Ross was there. Scott found that the land which Ross had believed to lie east of the ice-barrier, but which he had cautiously charted as an "appearance of land", was plainly visible, its highest summits rising 2000 ft.-3000 ft. above the sea. It was further discovered that McMurdo Bay, charted by Ross, was in reality the opening of a strait leading southwards between Ross Island and the mainland. Mt. *Erebus* proved to be not on the mainland, but on what is now mapped as Ross Island.

Jan. 2, 1923.—The Libyan Desert.

A. M. Hassanein Bey left Sollum, a small port on the Mediterranean near the western frontier of Egypt, on his difficult journey southward through the Libyan desert to Darfur. As a result of his work important new facts about the orography and geology of the region were recorded. His discovery of the rock basin oases of Arkenu and Owenat makes possible further desert travel in the still unexplored regions of the Libyan desert. His route linked up with Tilho's explorations in the French Sudan and confirmed the latter's conclusion that Lake Chad has no possible drainage outlet in an easterly direction.

Jan. 7, 1830.—The Murray River.

Charles Sturt launched a boat on the Murrumbidgee and sailed thence along the Murray to the sea. He had previously discovered a portion of the Darling River; this second "bold and desperate" venture solved the nature of the inland river drainage of south-eastern Australia.

### Societies and Academies.

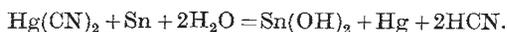
CAMBRIDGE.

Philosophical Society, Nov. 23.—T. M. Lowry and C. B. Allsopp: Refractive dispersion and the problem of 'optical exaltation'. A thin film of liquid is placed between the plates of a quartz etalon and the interference bands are focused on the slit of a spectrograph. The order of the interference bands is deduced from pairs of refractive indices determined with a refractometer. Refractive indices can then be deduced to four places of decimals in the visible or ultra-violet regions up to the limit of transparency of the film.—T. M. Lowry and H. K. Gore: Optical rotatory power of vapours. Measurements have been made of the rotatory dispersion of camphor and of camphorquinone as vapour and in solution. In the region of absorption, camphor gives a curve with a composite maximum. This is explained by the composite character of the ketonic absorption band, as evidenced by the fact that the curve of circular dichroism covers a smaller range of wave-lengths than the absorption curve.—T. M. Lowry and H. Hudson: Absorption and circular dichroism of optically active substances. Measurements have been made of the absorption, circular dichroism, and rotatory dispersion of a series of bornyl xanthates. The two absorption bands are optically active but of opposite sign. The curve of circular dichroism therefore crosses the axis, as is observed experimentally in the methyl xanthate.—C. P. Snow: Fine structure of absorption bands in crystals. The absorption bands of compounds of the rare earths in the crystalline state show well-marked discontinuities similar to the line spectra of the atoms. This has recently been shown to be due to the 'shielding' of an inner incomplete electronic group throughout the series of the rare earths. There is a marked sharpening of the lines when the crystals are cooled to liquid air temperature and below. Reasons for this have been discussed (see Snow and Rawlins, *NATURE*, 125, p. 349; 1930).—R. G. W. Norrish: Predissociation in relation to photochemical activity. A large group of primary photochemical effects may be correlated with the condition known as predissociation in the molecular absorption spectrum. With aldehydes and ketones, however, although photodecomposition coincides with predissociation, it is difficult to envisage the mechanism of the change, since the chemical data for some fifteen examples indicate that no free radicals are produced. It would appear that molecular rearrangement involving more than one bond occurs within the molecule.

PARIS.

Academy of Sciences, Nov. 23.—H. Vincent and L. Velluz: The immunigenic properties of the diiodosalicylic cryptotoxin. From experiments on guinea-pigs, it has been proved that the diiodosalicylic cryptotoxin, the preparation of which is given, is capable of rapidly conferring immunity against pure tetanus toxin. This cryptotoxin neutralises the tetanus toxin, the latter not being destroyed but converted into a harmless complex. This non-toxic complex rapidly immunises animals.—C. Sauvageau: The third kind of plurilocular organs of *Ectocarpus secundus*.—Paul Montel: The upper limit of the moduli of the zeros of polynomials.—Eduard Cech: The theory of dimensions.—Maurice Janet: The minimum of the ratio of certain integrals.—J. A. Lappo-Danilevski: The decomposition of the normal integral matrix of a system of linear differential equations and the construction of the primitive

matrix.—Jacques Devisme: Some partial differential equations.—Abramesco: The Leja factor of uniform convergence of a series of polynomials.—R. Mazet: The unicuity of the solution of problems of friction.—Constantin Woronetz: Lines of slip on a cylinder.—J. Baurand: Periodic waves at the surface of water.—Louis Bréguet: Aerodynamic suspension of the aerial vehicle.—J. Dufay and R. Gindre:  $\alpha$  Herculis, a variable star of very small amplitude. Previous observations on this variable star have given discordant results. The photometer used in these observations gives an accuracy of about a hundredth of a magnitude, and 136 photometric comparisons were made. The results are given in the form of a curve, showing a period of 22 days. The form of the curve corresponds to a double star with eclipses.—F. Link and J. Devaux: The photometric and actinometric study of the moon during the eclipse of Sept. 26, 1931.—Paul Woog, Jean Givaudon, and Mlle. Emilie Ganster: Neutralising varnishes; properties of orientation of their superficial molecules. Molecular polishing. By the application of certain varnish coatings, lubricating oil can be prevented from spreading out over solid surfaces. The composition and mode of treatment of such a varnish are given, and the theory of the process is discussed.—Guy Emschwiller: The mechanism of the photolysis of the alkyl iodides. Either of the two theories, dissociation or activation, affords an explanation of the phenomena observed in the photolysis of the alkyl iodides.—D. K. Yovanovitch and P. Savitch: The calorimetric study of the absorption of the  $\gamma$ -rays of radium. Instead of the usual ionisation method, the authors use a microcalorimeter. A null method is used, the heat produced by the radium being balanced by electrical heating. Curves are given showing the heat developed by absorption in lead, silver, and copper.—Mlle. M. Th. Francois: The anomalies observed when using benzene and nitrobenzene in cryoscopy. It is usually held that benzene and nitrobenzene possess two  $K$  constants, one normal and applying to most organic substances, the other abnormal (hydroxyl compounds), practically half of the first. The author's experiments cited do not confirm this.—Augustin Boutaric and Charles Tourneur: The study of colloidal solutions by the polarisation of the light diffused by them. For extremely small spherical particles, the theory of Lord Rayleigh shows that the diffused light should be totally polarised: if the particles increase in size, the proportion of polarised light should be reduced. Hence the study of the polarisation gives interesting information concerning the changes in a colloidal solution approaching the condition of flocculation.—G. Austerweil: The preparation and purification of salts by the use of zeolites.—J. Golsé: The reduction of mercuric cyanide by tin in the presence of certain metallic salts. Although tin is without action upon neutral solutions of mercuric cyanide, when sodium chloride (or certain other salts named) is added, hydrocyanic acid is set free, and the mercury is reduced to metal in accordance with the equation



—Ernest Kahane: The possibility of destroying considerable quantities of organic substances by means of perchloric acid. After a preliminary treatment with a mixture of nitric and sulphuric acids, and driving off water and excess of nitric acid, the perchloric acid is added drop by drop, the liquid being maintained at 190° C. The oxidation is rapid and complete.—E. M. Bellet: The reaction between esters and alcohols in a slightly alkaline medium.—André Kling and Daniel Florentin: The mode of action of hydro-

genating and mixed catalysts in the hydrogenating cracking of phenols.—Dalloni: The geological constitution of Tibesti. The pre-Cambrian substratum.—H. Le Breton: The coast-line of post-neolithic age in Xu-Nghé and in Trois-Quang of the north (Annam, French Indo-China).—Chadefaud: The morphological signification of the stigma of the zoospores and the zoogametes in the Heterokontæ and Phaeophyceæ.—Théodore de Camargo: The influence of the potash-nitrogen ratio on the development of the coffee plant during the first period of growth.—Emile F. Terroine and Mlle. Germaine Boy: The distribution of the nitrogen compounds of the urine in the minimum endogenous nitrogen consumption and in protein nutrition: the problem of existence and of the magnitude of the albuminoid reserves.—Mlle. Marcelle Lapique: Chronaxy of subordination in an invertebrate.—Mme. H. Heldt: Observations on the laying, fertilisation, and the first stages of development of the egg in *Pencus caramote*.—Maurice Pietre: Remarks on the physical state of the calcium phosphates in milk: the fractionation of their micelles leads to the existence of free calcium caseinate and of a calcium phosphate compound. By physical means, centrifugation, freezing, and especially by dialysis against water, glycerol or saccharose, increasing proportions of calcium phosphate can be separated, and by using sodium citrate a casein can be obtained containing only traces of lime. Hence it is concluded that in milk the colloidal lime exists as the triphosphate.—Bordier: A new helioactinometer. The amount of iodine set free from a solution of iodoform in chloroform under the influence of the solar photochemical rays is taken as a measure of the light received.—J. André Thomas: The production of tumours of sarcomatous appearance in the annelid *Nereis diversicolor* by inoculation with *Bacterium tumefaciens*.

#### GENEVA.

Society of Physics and Natural History, Nov. 5.—P. Rossier: The spectral sensibility of photographic plates. The author gives an analytical expression for the sensibility curve of the photographic plates used at the Geneva Observatory. This expression allows the study in some detail of certain applications of these plates to astronomical photometry.—E. Briner, H. Paillard, and R. Zurcher: Attempts at supplying an internal combustion motor with air mixed with ozone. In spite of the very low concentrations (about 1 in 10,000) in which it was introduced into the gas, ozone produced 'knocking'. On account of the peroxidising properties of ozone, the effect noted appears to support the theory attributing detonating combustion to the formation of very unstable intermediate peroxides.—R. Wavre: The small vibrations of liquid stars. The author applies the 'uniform method' to the study of the small movements of stars composed of a nucleus and a fluid envelope. Assuming the solid nucleus, he arrives at the results of Lord Kelvin concerning the oceanic tides. The contrary assumption of a liquid nucleus is a new problem which he has succeeded in solving. He develops also the influence of the terrestrial tide on the oceanic tide and gives the principal results.

#### LENINGRAD.

Academy of Sciences—*Comptes rendus*, No. 7, 1931.—N. Tagejeva and F. Starik: The radium content of the petroliferous waters of Tcheleken island. The water contains from  $6.75 \times 10^{-11}$  to  $4.37 \times 10^{-11}$  gm. of radium in 100 c.c. of water.—L. Kurbatov: The radioactivity of the mineral water of Nefte-dagh and Tcheleken.—V. Baranov and L. Kurbatov: The radium

content of the petroliferous waters in the Grozny district. The radium content of water in July-September proved to be considerably less than in March of the same year.—L. Komlev: The radium content in the water of oil wells in the Novo-Grozny district. Beginning with July 1929, a marked reduction on the radium content was observed, although the general chemical content of the water remained practically unchanged.—V. Ignatovskij: Functions which are orthogonal to the hypogeometrical series (1).

*Comptes rendus*, No. 8, 1931.—A. Fersman (1): A geochemical diagram of the Chibin mountains.—(2) The geochemistry of gold.—D. Priianishnikov: The formation of ammonia during the reduction of nitrates by the higher plants. Normal plants absorb ammonia more energetically than nitrates.—A. Popov: A new genus of fish, *Davidjordania* (Zoarididae), from the Pacific Ocean. *Lycenchelys lacertinus* Pavl. is made the type of a new genus, to which *L. ornatus* Sold. and *L. pæcilimen* Jord. and Fowl. are also referred. *Lycenchelys brachyrhynchus* Schm. belongs to the genus *Hadropareia*, and *L. fasciatus* Schm. is a synonym of *Lycodes fasciatus* Schm.—V. Scherbina: Chemical constitution of the nepheline from the Chibin mountains.

## SYDNEY.

Royal Society of New South Wales, Sept. 2.—H. Finnemore and C. B. Cox: The amount of hydrocyanic acid in *sorghum* sudan grass and some hybrids. *Sorghum* contains a higher amount of prussic acid than has been hitherto recorded, and it loses this acid as the plant develops, but even on cutting and wilting the young plant by no means becomes innocuous. Of the results obtained, it was shown that the variety *Feteritis* is the most poisonous. Contrary to opinions held in some quarters, it was found that sudan grass contains an appreciable amount of prussic acid.—F. R. Morrison and R. Grant: A contribution to the chemistry of the fruit obtained from the White Cedar tree (*Melia Azedarach*, L. var. *australasica* C. DC; Syn. *Melia australasica*, A. Juss) growing in New South Wales, with notes on its reputed toxicity. Proximate analyses of the fruit were obtained from trees growing at Grafton and Dubbo, New South Wales, respectively. The ripe fruit obtained from Grafton trees contains a sticky pulp, consisting of a starchy meal, a resin, an oil, and dextrose, with acid and other water-soluble substances. Feeding tests using guinea-pigs showed the Grafton fruit to be non-toxic, whilst fruit from trees growing at Dubbo and Parramatta, respectively, proved in some cases to contain a toxic constituent, which was found to be present in the resinous portion of the fruit. A very small quantity of basic material was extracted from an ether solution of the resin by means of 0.5 per cent sulphuric acid solution. Neither the basic extract nor the resin from which it was extracted produced toxic symptoms when administered alone, but a mixture of both produced fatal results.

Oct. 7.—J. C. Earl and C. H. Wilson: The condensation of  $\alpha$ - $\beta$  dibromocarboxylic acids with benzene in the presence of aluminium halides. Cinnamic acid dibromide and crotonic acid dibromide when treated with aluminium chloride and benzene give the corresponding derivatives of dihydrophenanthrene. By the use of ferric chloride or aluminium bromide, instead of aluminium chloride, linking between the two phenyl nuclei does not take place,  $\alpha\beta$ -triphenylpropionic acid and  $\alpha\beta$ -diphenylbutyric acid being formed from the cinnamic and crotonic acid dibromides respectively.

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## Diary of Societies.

## FRIDAY, JANUARY 1.

- ROYAL INSTITUTE OF BRITISH ARCHITECTS, at 3.30.—E. R. Jarrett: Christmas Juvenile Lecture on Architecture.  
ROYAL PHOTOGRAPHIC SOCIETY, at 7.  
JUNIOR INSTITUTION OF ENGINEERS, at 7.30.

## SATURDAY, JANUARY 2.

- ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—Sir William Bragg: The Universe of Light (Christmas Lectures) (3): Light and Colour (1).

## MONDAY, JANUARY 4.

- VICTORIA INSTITUTE (at Central Buildings, Westminster), at 4.  
INSTITUTION OF ELECTRICAL ENGINEERS (Mersey and North Wales—Liverpool—Centre) (at Liverpool University), at 7.  
INSTITUTION OF RUBBER INDUSTRY (at Engineers' Club, Manchester), at 7.  
WOLVERHAMPTON AND DISTRICT ENGINEERING SOCIETY (at Victoria Hotel, Wolverhampton), at 7.30.  
BRITISH KINEMATOGRAPH SOCIETY (at Gaumont Theatre), at 7.45.  
ROYAL INSTITUTE OF BRITISH ARCHITECTS, at 8.  
SOCIETY OF CHEMICAL INDUSTRY (London Section) (at Chemical Society), at 8.

## TUESDAY, JANUARY 5.

- ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—Sir William Bragg: The Universe of Light (Christmas Lectures) (4): Light and Colour (2).  
INSTITUTION OF ELECTRICAL ENGINEERS (North-Western Centre) (at Engineers' Club, Manchester), at 7.  
INSTITUTION OF AUTOMOBILE ENGINEERS (at Royal Society of Arts), at 7.45.

## WEDNESDAY, JANUARY 6.

- ROYAL SOCIETY OF ARTS, at 3.—Prof. E. N. da Costa Andrade: The Vacuum, or the Importance of Nothing at All (Dr. Mann Juvenile Lectures) (1).  
INSTITUTION OF ELECTRICAL ENGINEERS (Wireless Section), at 6.  
INSTITUTION OF ELECTRICAL ENGINEERS (Tees-Side Sub-Centre) (at Cleveland Technical Institute, Middlesbrough), at 7.  
INSTITUTION OF HEATING AND VENTILATING ENGINEERS (at 20 Hart Street, W.C.1), at 7.  
INSTITUTION OF AUTOMOBILE ENGINEERS (at Queen's Hotel, Birmingham), at 7.30.  
INSTITUTE OF BREWING (North of England Section) (at Midland Hotel, Manchester).  
ROYAL MICROSCOPICAL SOCIETY (Biological Section) (at B.M.A. House, Tavistock Square).

## THURSDAY, JANUARY 7.

- ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—Sir William Bragg: The Universe of Light (Christmas Lectures) (5): Light from the Sky.  
LINNEAN SOCIETY OF LONDON, at 5.  
INSTITUTION OF CIVIL ENGINEERS (Birmingham and District Association) (at Chamber of Commerce, Birmingham), at 6.  
INSTITUTION OF ELECTRICAL ENGINEERS, at 6.  
INSTITUTION OF AUTOMOBILE ENGINEERS (Bristol Centre) (at Merchant Venturers' Technical College, Bristol), at 7.  
SOCIETY OF CHEMICAL INDUSTRY (Bristol Section) (at Bristol University), at 7.30.  
ROYAL SOCIETY OF MEDICINE (Tropical Diseases and Parasitology Section), at 8.

## FRIDAY, JANUARY 8.

- ROYAL GEOGRAPHICAL SOCIETY, at 3.30.—Mrs. Murray Chapman: Through Lapland in Winter with Sledge and Reindeer (Christmas Lecture for Young People).