

indicated a relative humidity of only five per cent, with a probability that two per cent may be attained at times.

The diurnal range of temperature is so great that, in spite of the very high day temperatures, frost is not unknown. On Dec. 14, 1922, the air temperature measured on a march by sling thermometer was 92° at 2.30 P.M., and during the ensuing night in camp the minimum was 31°.

### University and Educational Intelligence.

LONDON.—A Bayliss-Starling Memorial Scholarship has been founded by old students, friends, and admirers in commemoration of the late Sir William Bayliss and Prof. E. H. Starling. The annual value of the scholarship is about £120, with exemption from tuition fees, and it is tenable at University College. The Scholar will be required to follow a course of study approved by the Jodrell professor of physiology, involving a training in the principles of, and methods of research in, physiology and biochemistry. Candidates must send their applications to the Secretary of University College not later than Wednesday, May 14.

AN election of junior Beit fellows for medical research will take place in July next. The yearly value of each fellowship will be £400, and the tenure, ordinarily, three years. Forms of application (returnable on or before June 1) may be obtained by letter only, addressed to: Sir James K. Fowler, Honorary Secretary, Beit Memorial Fellowships for Medical Research, 35 Clarges Street, W.1.

APPLICATIONS are invited from British subjects by the L.C.C. for two Robert Blair fellowships in applied science and technology, each of the value of £450 and tenable for one year in the Dominions, the United States, or other places abroad. Particulars and application forms (T3/300) are to be had on application to the Education Officer (T. 3), The County Hall, S.E.1. The latest date for the return of forms is June 18.

UNIVERSITY COLLEGE, LONDON, has just issued its report for the year ending February 1930, with statistics for 1928-29 showing a total enrolment of 3249 students, including 2399 whose homes were in the British Isles, 311 from the rest of the Empire, 52 from the United States of America, and 487 from other parts of the world. 1466 were in the different stages of degree courses, 523 were graduate and research students, 441 evening and 266 vacation students. In addition, free public lectures, among them seven by visiting professors from the continent—Dutch (2), Belgian, German (2), Swedish, and Danish universities—were attended by more than 14,450 persons, the aggregate number of attendances at the 67 lectures being 29,590. Among academic developments during the year was the establishment of a chair of American history for which the Commonwealth Fund of New York gave 214,500 dollars. The Centenary Fund, inaugurated three years ago to provide £500,000 for the completion of buildings and equipment and for endowment, amounted on Jan. 31, 1930, to £223,860. The office of Provost of the College, held for twenty-five years by Sir Gregory Foster, on whom the honour of a baronetcy was conferred last New Year's Day, passed, as from the same date, to Mr. Allen Mawer, formerly Baines professor of the English language in the University of Liverpool.

### Historic Natural Events.

April 20, 1897. *Aurora Australis*.—A remarkable display of aurora was observed in the South Indian Ocean in lat. 47½° S. It began at 6.30 P.M. with a diffused light; horizontal flashes soon spread and flared in every direction, increasing in length and brilliancy, until at 7.30 P.M. they were shooting across the sky to within 30° of the northern horizon. Cones and circles of light travelled rapidly over the whole sky, flashing beams of intense brilliancy from one to the other. This continued until 8.30 P.M., when an arch of bright green light fading off into yellow formed over the southern horizon, rose rapidly to a high altitude, and was followed by similar arches in regular sequence, until there were six distinct arches, their apices being from 10° above the southern horizon to 60° above the northern horizon. They were formed of narrow vertical bands of light from 5° to 20° deep, bright green and yellow at their upper edges, and of a rosy hue at their bases. At 9 P.M. a brilliant circle formed round the zenith, composed of narrow bands of light, pendant overhead and having a rotary motion, producing the effect of the vertex of an electrical cyclone. The display lasted until 9.45 P.M.

April 22-25, 1547. *Red Sun*.—In the whole of Germany, France, and England the sun appeared reddish and dull, like a ball with spots, so that the stars were visible (especially on April 24, during the battle of Mühlberg).

April 22, 1884. *Colchester Earthquake*.—No British earthquake has resulted in so much damage to property as this shock. Within an area of 10 sq. miles to the south and east of Colchester, 1213 buildings and 31 churches had to be repaired. In Colchester more than 400 buildings were injured, while at three villages—Abberton, Peldon, and Wivenhoe—about 70 per cent of the chimneys were thrown down. The Colchester earthquake is one of the few British earthquakes that have been felt on the Continent, as at Boulogne and Ostend.

April 24, 1579. *Snow*.—Holinshed records that snow fell in London between 4 A.M. and 9 A.M. to the depth of a foot. This is the more remarkable because, according to the present calendar, the date would have been early in May.

April 25-26, 1908. *Great Snowfall*.—This was one of the greatest spring snowfalls on record in the Midlands and southern England. About six inches of snow fell near London on April 24, but the heaviest fall occurred on April 25, accompanied by a strong gale in the English Channel. At Southampton, work at the docks was brought to a standstill, and throughout Oxfordshire, Berkshire, and the north of Hampshire all traffic by road was held up and communication by rail was maintained only with the greatest difficulty. The thaw caused a severe flood in the Thames.

April 25, 1926. *Floods*.—Owing to a rapid thaw of the heavy snows of the preceding winter, the rivers of Russia were in flood, all the low-lying parts of Leningrad, Moscow, and many other towns being under water. The damage was accentuated by blocks of drifting ice.

April 26-28, 1867. *Gale and Floods in Brisbane*.—Rain commenced to fall on April 26 and continued throughout April 27, becoming torrential on April 28. On this day the wind rose to gale force, doing much damage. The river rose rapidly to an abnormally high level, and the banks were covered by debris from the valley. The lower parts of Brisbane were flooded.

April 26, 1902. *Green Flash*.—Mr. C. T. Whittmell records in the Journal of the British Astronomical

Association that: "In the belfry of the Wesleyan Chapel, on the west side of Woodhouse Moor, there are narrow, horizontal openings through which the setting sun can send his rays. . . . On Saturday, 26th April, between 7.15 and 7.30 p.m. I was so exceptionally fortunate as to observe, through the openings, no fewer than three green and redflashes. The red ones were seen just as the base of the sun successively revealed itself below each of the upper edges of three openings. The green ones were seen just as the top of the sun disappeared behind each of the lower edges of the openings. Moving aside afterwards, in order to watch the actual sunset on the true horizon, distant some three miles, I observed a beautiful bluish green flash just as the sun's top sank out of sight at 7h. 23m. The sky was singularly clear, and there was a cool fresh breeze from north-east."

April 26-29, 1928. Dust Fall.—A great fall of dust took place in eastern Europe, travelling in a west-north-west direction from the coast near the Sea of Azov, as far as the upper Weichsel. The darkness was so great that artificial light was in use all day, and in southern Russia the fallen dust formed heaps like snow drifts a foot or more in depth, but farther to the north-west the depth was less than a sixth of an inch. The origin of the dust is unknown, but it occurred with an easterly wind, and was heaviest where this wind reached the coast from the open sea.

### Societies and Academies.

#### LONDON.

Linnean Society, Mar. 20.—C. Tate Regan: A new Ceratioid fish (*Caulophryne* sp.), female with male, from off Madeira. The fish represents a new species of the genus *Caulophryne*, distinguished from *C. jordani* Goode and Bean by the greater number of dorsal and anal rays and by the filaments on the stem of the illicium. Although distended by a recently-swallowed fish larger than itself, it took a bait, and was caught on a long line off Madeira. The specimen is a female, 210 (145 + 65) mm. long, with a dwarfed and parasitic male 21 (16 + 5) mm. long attached to its abdomen.—Lieut.-Colonel J. Stephenson: On an Oligochæta worm parasitic in frogs of the genus *Phrynomerus*. A specimen of a Nigerian frog, *Phrynomerus microps*, recently examined had a number of small worms hanging out in a cluster of about a dozen from the anterior angle of each eye and from under the neighbouring part of the lower lid. The worms belonged to a new species of the genus *Nais* of the freshwater family Naididæ. In a second species of the genus *Phrynomerus* (*bifasciatus*), from Beira, Portuguese East Africa, the Harderian (lacrymal) glands were found to be distended and transformed into a sac containing a number of small worms; these belonged to the same species as the preceding. This discovery prompted the stripping of the mucous membrane from the roof of the mouth of the first frog, from Nigeria, when it was discovered that in it also the Harderian glands contained a number of the worms. Oligochæta are rare as external, and still rarer as internal parasites.

Society of Public Analysts, April 2.—Ella M. Collin: The separation of cadmium and copper in spelter and zinc ores by internal electrolysis. The most satisfactory method is to deposit the copper first from a sulphate solution containing a small excess of sulphuric acid, to dissolve the copper in excess of nitric acid, and to electrolyse the solution at 70°. The original sulphate solution is readjusted with ammonia, sulphuric acid, and sodium acetate, and the cadmium

electrolytically deposited. The anodes are of zinc, and a 5 per cent solution of zinc sulphate acidified with sulphuric acid is used in the anode compartments.—A. F. Lerrigo: Routine detection of nitrates in milk. A modification of the diphenylamine test is capable of detecting the addition of 5 per cent of a water containing about 0.5 part of nitric nitrogen per 100,000. The test is regularly applied in Birmingham to all samples of milk containing less than 8.5 per cent of solids-not-fat.—J. C. Ghosh: The determination of titanium as phosphate. The prepared ore or clay is fused with sodium carbonate, and the mass treated with boiling water, which dissolves aluminium and silica as sodium salts, leaving sodium titanate in the residue. This is hydrolysed and is then dissolved in either sulphuric or hydrochloric acid, and when boiled yields a precipitate of metatitanic acid. This is dissolved, the solution just neutralised with ammonia, and the titanium precipitated and weighed as phosphate.

#### LEEDS.

Philosophical and Literary Society, Mar. 4.—J. E. Roberts: Note on the critical potentials of the hydrogen molecule. The observed critical potentials of the hydrogen molecule are considered in the light of the potential energy curves for the various states and the Franck-Condon principle. The most probable energy change requires 12.8 volts, though this is not, strictly speaking, a critical potential, the latter being in the region of 12 volts. A further potential between 8 and 9 volts reported by Jones and Whiddington is probably due to the excitation of the triplet states with consequent dissociation of the molecule and emission of the continuous spectrum.—J. E. Roberts and R. Whiddington: The passage of electrons through argon. Excitation potentials of argon have been investigated experimentally by the magnetic spectrum method already described. The three sharp loss lines have been examined photo-metrically, and found to be much narrower than the corresponding loss lines in the case of certain diatomic molecules. In order of intensity, the losses in volts of the lines are 11.6; 14.1; 13.0, and this is the descending order of their intensities.—E. C. Stoner: (1) Free electrons and ferromagnetism. The question is considered as to whether ferromagnetism may be due to 'free electrons', that is, electrons forming an 'electron gas' as in Sommerfeld's theory of conductivity. For spontaneous magnetisation to occur, the change in the interaction energy associated with magnetisation must exceed the increase in the kinetic energy of the electrons. On this basis, it is shown that the Curie temperature  $\theta$  would have a minimum value depending on the saturation intensity  $I_0$ . To a sufficient approximation  $\theta > 6.74 \times 10^2 \times I_0^{2/3}$ . This gives  $\theta > 43,160^\circ$  for nickel (observed  $640^\circ$ ) and correspondingly large values for other ferromagnetics. It is concluded that ferromagnetism is not due to free electrons, but to interchange interaction electrons as in Hasenbergs theory. If the 'magnetic' electrons are the same as the conduction electrons, as Dorfmann's thermo-electric measurements indicate, it follows that conductivity may be due to interchange electrons. The bearing of this on the theory of the magnetic and electric properties of metals is indicated. (2) The interchange interaction theory of ferromagnetism. Considering the atoms in a crystal as separate systems interacting with neighbouring atoms, a very simple treatment of the interchange interaction theory of ferromagnetism is given. The method differs from that of Heisenberg, who considers the whole crystal as a single system. The terms which make the original formulæ unsatisfactory