

a whitish vertical streak equal in width to the sun and reaching up to  $5^\circ$  above it. The sun's disc was strangely distorted before it disappeared at 5.49, and the pillar remained visible until 6.9. At Golders Green at 5.30 it came out of the sun's disc like a tree trunk, red-orange in colour, turning to gold and then becoming whiter. Other observers described it as blood-red, apricot, or rose pink streaked with primrose yellow, but all agreed on its extreme beauty. Some experienced observers estimated the height as  $30^\circ$ , though sun pillars exceeding  $15^\circ$  are exceedingly rare.

Mar. 15, 1889. Hurricane at Samoa.—On Mar. 15 the harbour of Apia, Samoa, was crowded by seven warships, one British, three American and three German, all of which had been sent there because of the strained political situation, as well as two merchant ships and two schooners. On the afternoon of that day the island was struck by a violent hurricane from north-north-east (the harbour opens to the north), and all the vessels were either sunk or driven ashore with the exception of H.M.S. *Calliope*, which was able to steam out of the harbour.

Mar. 15, 1929. Floods in Alabama.—As a result of heavy rain at the end of February and early in March, the valleys of the Choctawhatchee and Escambia Rivers in Alabama were already saturated with water, when on Mar. 13–15 further heavy rains fell over the district, reaching 29.6 inches in three days at Elba, of which 20 inches fell on Mar. 15. (This amount is partly estimated, as the rain-gauge was carried away by the floods after 14 inches had been recorded.) The towns of Elba and Brewton, at the junctions of rivers, were flooded to a depth of more than 10 feet in places, and great damage was done, estimated at nearly five million dollars. Owing to the flood warnings, no lives were lost.

## Societies and Academies.

### CAMBRIDGE.

Philosophical Society, Jan. 27.—A. F. H. Ward: A microcalorimeter. A microcalorimeter was described accurate to 0.0005 cal. The system liberating the heat fits closely inside a copper tube contained in a Dewar flask. A series of iron-constantan thermocouples has one set of junctions making good thermal contact with the tube and the others in a brass ring outside, kept in a thermostat. They are connected to a sensitive moving-coil galvanometer. The Tian multiple walled thermostat is used—three concentric thick copper cylinders, insulated with kapok, the inner containing water. The temperature of the outer cylinder is controlled with a mercury regulator, and the insulating layers cut down temperature variations so that the inner vessel is constant to less than  $1/500,000^\circ\text{C}$ .

### PARIS.

Academy of Sciences, Jan. 27.—The president announced the death of General Sebert.—L. Cayeux: The existence of two groups of Algae with the structure preserved in the 'schisto-limestone system' of the French Congo. There is ground for supposing that, in the oolitic complex of the limestone schists of the French Congo, certain limestones of oolitic appearance are petrified Algae.—Charles Nicolle, Paul Durand, and Ernest Conseil: Preventive vaccination against plague pneumonia by the respiratory tract. In addition to the usual injection of dead plague bacilli, a method of inhaling a suspension of the serum as a spray was tried. 866 cases were treated, and less than 1 per cent died of the plague.—Serge Bernstein: A class of polynomials of minimum deviation.—Louis Roy:

The fundamental equation of shock waves on elastic surfaces.—G. Friedel and R. Weil: The influence of the symmetry of the medium on the symmetry of the crystalline forms.—Auguste Lumière and Mlle. Anna Malespine: The impeding influence of gestation on the Arthus phenomenon.—Alexandre Ostrowski: Some generalisations of the Euler product  $\prod_{\nu=0}^{\infty} (1+x^{2\nu})$ .

S. Stoilov: The topological character of a theorem on the meromorphic functions.—W. Břečka and J. Gueronimus: An inequality for monotone polynomials.—Henri Eyraud: The summation of divergent integrals in the theory of spectra.—M. A. Andronow and A. Witt: The mathematical theory of auto-oscillations.—F. Campus: The mean fibre of large hyperstatic arches.—Maurice Lambrey: The influence of foreign gases on the absorption spectrum of nitric oxide.—Félix Ehrenhaft: Magnetophoresis and electrophoresis. A description of the phenomena observed when submicroscopic particles are examined under the microscope in a powerful magnetic field and in an electric field.—J. J. Trillat: The structure of gelatine. The results of an X-ray study of films of gelatine.—Jean Dalsace, M. Gory, and Nemours-Auguste: An attempt on the radiographic visibility of the kidney. Intra-arterial injection of lipiodol, which is not toxic to the animal, brings out anatomical details in radiographs, especially in the kidney and suprarenal capsules.—J. Décombe: The passage from the  $\beta$ -ketonic esters to the  $\beta$ -amino esters. The reduction of the azines or oximes of the  $\beta$ -ketonic esters by the usual reducing agents does not give the amino esters, as might have been expected: the reduction of the acetylhydrazones or benzoylhydrazones of these esters, however, gives the amino esters with fair yields.—L. Haskelberg: Researches on the preparation of the glycerol esters of the amino acids.—Augustin Boutaric and Mlle. Madeleine Roy: Researches on the sedimentation of suspensions of clay. The results described are in general agreement with those obtained by Dubrisay.—H. Besaire and Mlle. E. Basse: New stratigraphical and palaeontological observations on the upper Cretaceous of the province of Maintirano (west of Madagascar).—Ch. Brioux and Edg. Jouis: The correlation between the fineness and the solubility in carbonic acid of powdered limestones, and their neutralising action on acid soils. The availability for agricultural purposes of powdered limestone is shown to depend on its state of division. The neutralising action in the soil is in direct relation with the rate of solution in solutions of carbon dioxide. A commercial method of valuation based on these facts is suggested.—P. Chevey: Various rhythms other than thermal rhythms capable of marking the scales of fishes of the intertropical zone.—E. Kohn-Abrest, Mlle. Hélène Villard, and L. Capus: The presence of thiocyanates in the human organism. The post-mortem transformation of veronal, dial, gardenal into cyanogen compounds. Consequences in toxicology. It is known that hydrocyanic acid under the influence of putrefaction can be partially converted into thiocyanic acid, and the presence of the latter is frequently the only proof of poisoning by a cyanogen compound. Human viscera, even after much putrefaction, are normally free from thiocyanates, but after the administration of veronal, dial, or gardenal, appreciable quantities of thiocyanates can be found. These new facts must be taken into account by toxicologists.

### COPENHAGEN.

Royal Danish Academy of Science and Letters, Nov. 15.—Elis Strömrgren: Continued researches on the restricted problem of three bodies. Continued

researches on asymptotic solutions in the restricted problem of three bodies have led to the discovery of a whole system of hitherto unknown classes of periodic orbits.

Nov. 29.—Harald Bohr: (1) On integral functions. General solution of a problem proposed by Borel.—(2) On analytic, almost periodic, functions.—C. Wesenberg-Lund: Contributions to the biology of the Rotifera (2). Deals mainly with the sexual biology of the Rotifera, studied for several years in a series of ponds in the northern part of Seeland.—Ojvind Winge: Sex-determination in the Cyprinodont *Lebistes reticulatus*. In *Lebistes*, individuals with two X-chromosomes are generally females and XY-individuals are males. As an exception XX-males are produced, owing to genes, outside the Y-chromosome, pulling in male direction. This observation explains to a certain degree the peculiar disagreement between the sex-determination in *Lebistes* and the closely allied genus *Platyæcilus*, where the males have XX and the females XY chromosomes.

#### ROME.

Royal National Academy of the Lincei, Nov. 3.—C. Foà and A. Peroni: First attempts to register action currents of the acoustic nerve.—P. Tortorici: The principle of the arithmetic mean.—A. M. Bedarida: The theory of ideals of a finite algebraic body (4).—I. Todros: Projective-differential investigations on pairs of plane lines or of surfaces.—E. Gugino: The validity and extension of the theory of maximum effort.—G. Supino: Certain integral properties of cubic expansion. For certain investigations to be published shortly, use has been made of the following integral relations concerning the cubic expansion  $\theta$  of an elastic solid  $S$  subjected to external forces in equilibrium acting only on its surface  $\sigma$ :

$$(1) \int_S \theta dS = \frac{mE}{m-2} \int_{\sigma} (xP_x + yP_y + zP_z) d\sigma, \text{ and}$$

$$(2) \int_S y\theta dS = \frac{mE}{m-2} \int_{\sigma} \left( xyP_x + \frac{y^2 - x^2 - z^2}{2} P_y + yzP_z \right) d\sigma.$$

With these as starting-point, it is shown that, if a system of forces in equilibrium (with components  $P_x, P_y, P_z$ ) acts on a single plane zone  $\sigma$ , of an elastic solid, the total cubic expansion caused in the solid by these forces is zero.—E. Raimondi: The dynamic effect of a translatory-circulatory current investing a thin cylinder in the neighbourhood of an indefinite plane wall.—G. Wataghin: An application of relativity to quantum mechanics. The principal differential equations used in quantum mechanics and in the theory of relativity may be derived from a single variational principle.—M. Merola: The variability of Y Canes Venatici.—P. Tortorici: New determination of the local deviation in latitude and in longitude at the Astronomical Observatory of Palermo.—F. Scandone: The Hall effect with extended electrodes (3).—L. Mascarelli and D. Gatti: Contribution to the knowledge of diphenyl and of its derivatives (5). To obtain derivatives of diphenyl, use has been made of various methods which serve to prepare the corresponding derivatives of benzene.—O. Cantoni: Investigations on the supposed existence of pulmonary lipo-dieresis. Experimental results, obtained under various conditions, fail to confirm the hypothesis of pulmonary lipo-dieresis.

#### VIENNA.

Academy of Sciences, Nov. 28.—M. Beier: Zoological expedition to the Ionian Islands and the Peloponnesus (6). Fishes worked out by M. Holly.—E. Schweidler: The disintegration constant of radium D.—H. Hornich: The complete independence of Menger's axioms of dimension.—F. Morton: Measure-

ments of brightness with grey-wedge photometers on a sea voyage from Europe to Guatemala and in Guatemala, 1928-29. The exposed strips of photometer paper wrapped in tinfoil were sent back every four weeks to the observatory at Davos-Platz for development. The values found for insolation were less than those at Davos.

Dec. 5.—A. Köhler: Geological and petrographical investigations into the deeper rocks of the Lower Austrian Waldviertel and its boundary regions (1).—A. Köhler: Chemical analysis of the hornstone rock of Niederndorf near Erlauf, Lower Austria.—M. Beier: Zoological expedition to the Ionian Islands and the Peloponnesus (7). Ixides worked out by P. Schulze.—A. Zinke and R. Wengen: Perylene and its derivatives (28).—K. Ehrenberg: A remarkable bear's skull from the Bärenhöhle near Winden in Burgenland.—G. T. Whyburn: The sum of regular curves.

Dec. 12.—F. Becke: The systematics and nomenclature of the 32 symmetry classes of crystals. The German mineralogical society discussed this matter in Duisburg in 1926 and in Breslau in 1927. F. Becke, E. Schiebold, and F. Rinne expressed themselves in lectures at Breslau, and F. Rinne has put his proposals in final form in 1929 in Vol. 50 of the *Abhandlungen* of the Saxon Academy.—W. Schmidt and P. Lehmann: Experiments on the 'breathing' of soil. Under oscillations of atmospheric pressure the air in the soil is movable.—A. Dadiou and K. W. F. Köhler: The Raman spectrum of organic substances. Various substances were tried, esters and salts of acetic acid, derivatives of benzol. The acetone line  $\lambda 3008$  was not verified.—K. Prziham: Remarks on natural blue rock-salt. There may be layers in the crystals corresponding to cubic and other layers corresponding to rhombic-dodecahedral surfaces. Secondary recrystallisation is a possibility.—G. Schaum: Communication of the Radium Institute No. 245a. Action of  $\beta$ - and  $\gamma$ -rays on electrolytic solutions. A capillary tube with 30 mgm. radium was submerged in a concentrated solution of silver nitrate for two months. A grey precipitate formed.

Jan. 16.—L. Moser, K. Neumayer, and K. Winter: Determination and separation of rare metals from other metals (19). New methods for the separation of titanium from other elements. Tetravalent titanium can be precipitated in sulphuric acid solution by means of tannic acid and antipyrine.—A. Kailan and A. Ostermann: Velocity of esterification with ethylalcoholic, ethylene-glycolic, and glyceric-hydrochloric acid.—H. R. v. Gaertner: Geology of the Central Carian Alps. A great number of new fossil finds in Silurian, Devonian, and Carboniferous strata, including graptolites and trilobites in upper Silurian and cephalopods in upper Devonian.—J. Schaffer: Change of function in gland organs of the skin. The shrew-mouse has skin-glands commonly called sweat-glands but secreting fat and albumen with a characteristic smell; more probably these are scent or trail glands. The water-shrew has glands that swell in the breeding season, so also the sebaceous glands of the gemse. The secretion in the gland-bag of the badger seems to change from youth to age.—M. Glaessner: The danic stage in the Gosau basin. Conglomerates in the Salzkammergut.—R. Ebner and colleagues: Hymenoptera from Palestine and Syria (Zoological expedition, 1928).—P. Esben-Petersen: Neuroptera (F. Werner's zoological expedition to the Anglo-Egyptian Sudan, 1914).—F. Werner: Scientific results of a zoological expedition to western Algeria and Morocco (3).—J. Hoffmann: Communication of the Radium Institute (246). Behaviour of ultramarine and of some natural and artificial silicates towards radium rays.—K. Menger: Sketch of a new theory of measure. Axioms of dimension and measure.