

of 1,400 miles from the Cape the arts of smelting iron and copper, and of carving in ivory were known. Commerce had penetrated in that direction nearly 1,400 miles, and a trade to the amount of 1,600£ had been carried on in one expedition. Captain Alexander had volunteered to explore these regions. He had sailed from England in September last." As regards the expedition in British Guiana: "The French nation had sent out two gentlemen for the purpose of making discoveries, and from the funds of the Geographical Society 500£ had been given towards sending out from this country a gentleman for the same purpose. The Government of the country had contributed 1,000£ to forward his exertions in so laudable an enterprise."

The Eastern Counties Railway

By 1835, plans for railways to connect London with the north, south, west and east of England were being prepared, and on January 17, 1835, the *Mechanics' Magazine* said that the "Eastern Counties Railway which is to run from London to Yarmouth, by way of Chelmsford, Colchester, Ipswich and Norwich will be one of the most level, for its length, yet laid down in the whole kingdom. According to the report of the engineers, there will be nowhere a greater rise than 1 in 400; no embankment of more than 28 feet high; and not a single tunnel throughout its whole length. The average cost per mile will, in consequence of these singularly favourable circumstances, be less than any other railway constructed, or in progress of construction, in Great Britain. The estimates of revenue are also extremely encouraging. From there being no canal communication between the metropolis and the counties of Essex, Suffolk and Norfolk, there is a greater waggon traffic on this line than on any other in the kingdom. The passenger traffic is also so considerable, that it would of itself suffice to pay all the expenses of the railway, and leave a handsome profit to the proprietary."

Volcanoes of South America

On January 18, 1835, for the second time, H.M.S. *Beagle* anchored in the bay of San Carlos in Chiloe. "On the night of the 19th," wrote Darwin, "the volcano of Osorno was in action. At midnight the sentry observed something like a large star, which gradually increased in size till about three o'clock, when it presented a very magnificent spectacle. . . . I was surprised at hearing afterwards that Aconcagua in Chile, 480 miles northwards, was in action on this same night; and still more surprised to hear that the great eruption of Coseguina (2,700 miles north of Aconcagua), accompanied by an earthquake felt over a 1,000 miles, also occurred within six hours of this same time. This coincidence is the more remarkable, as Coseguina had been dormant for twenty-six years; and Aconcagua most rarely shows any signs of action. It is difficult even to conjecture, whether this coincidence was accidental, or shows some subterranean connection. If Vesuvius, Etna, and Hecla in Iceland (all three relatively nearer each other than the corresponding points in South America) suddenly burst forth in eruption on the same night, the coincidence would be thought remarkable; but it is far more remarkable in this case, where the three vents fall on the same great mountain-chain, and where the vast plains along the entire eastern coast, and the upraised recent shells along more than 2,000 miles on the western coast, show in how equable and connected a manner the elevatory forces have acted."

Societies and Academies

DUBLIN

Royal Dublin Society, November 27. E. J. SHEEHY: A crate for the collection of fæces and urine adjustable for metabolism experiments (solid and liquid) with pigs, sheep and cattle of various sizes. J. HARDIMAN, J. KEANE and T. J. NOLAN: The chemical constituents of lichens found in Ireland. *Lecanora gangaleoides* (1). This lichen contains, besides chlor-atranorin, a chlorinated depsidone of constitution $C_{16}H_8O_5Cl_2(OCH_3)_2$ closely allied in structure to diploicin, $C_{16}H_7O_4Cl_4(OCH_3)_2$, previously found in the lichen *Buellia canescens*. H. H. POOLE and W. R. G. ATKINS: The measurement of the current generated by rectifier photo-cells. A modification of the method recently described by Campbell and Freeth has proved very suitable for photometric measurements over a very wide range of illumination, and is especially adaptable to marine work (see NATURE, Nov. 24, p. 810). THOMAS DILLON and TADHG O'TUAMA: The cellulose of marine algæ. Cellulose was obtained from species of *Laminaria* (1) by successive extraction with ammonia and with caustic soda and (2) by a process of retting followed by extraction with soda. The methyl and acetyl derivatives and the thiocarbonate of this cellulose resembled in properties the corresponding derivatives of the cellulose obtained from land plants. When the cellulose was hydrolysed with sulphuric acid, glucose was obtained, which was identified by the osazone. Failure to obtain glucose from algal cellulose reported by other authors may have been due to the impurity of the cellulose, which in the plant appears to be closely associated with a substance corresponding to the lignin of land plants. VINCENT BARRY and THOMAS DILLON: Preparation and properties of alginic acid and the extraction of marine algæ with various solvents. High viscosity has always been regarded as the most characteristic property of solutions of the alkali alginates. It has now been found that, if the fronds of *Laminaria digitata* are extracted with boiling water and then with ammonia, the ammoniacal solution which contains the alginic acid is not highly viscous, and filters easily. Extraction with a series of solvents in the order mentioned gave approximately the following extracts expressed in percentages of the dry plant: water 40, industrial alcohol 10, industrial alcohol containing a little hydrochloric acid 2, ammonia 20, boiling caustic soda 20, residue of cellulose 8.

PARIS

Academy of Sciences, December 10 (*C.R.*, 199, 1345-1463). The president announced the death of Adrien de Gerlache de Gomery, *Correspondant* for the Section of Geography and Navigation. MARCEL BRILLOUIN: The Planck quanta and the field of atomic force. A development of the hypothesis that Planck's constant should appear as a fundamental constant of the atomic field which governs the motions of the electrons and the mutual actions of the atoms. CHARLES NICOLLE and MME. HÉLÈNE SPARROW: Some experiments on the virus of the river fever of Japan (*Tsutsugamushi*). This belongs to the class of exanthematic fevers and is distinct from typhus. It is propagated by animal parasites, ticks. The rat acts as a carrier for the disease. In this animal there is no fever, and the disease is

clinically unrecognisable. H. DEVAUX: The action of carbon dioxide on the extension of egg albumen on the surface of water and the variations of the thickness of its films in monomolecular layers. ROBERT LESPIEAU was elected a member of the Section of Chemistry in succession to the late C. Matignon. HENRI EYRAUD: A new representation of continuous correlations. GEORGES DARMOIS: The theory of two Spearman factors. PAUL DELENS: Congruences of curves in affine varieties. PIERRE BERGEOT: The convergence of the developments in series of Legendre polynomials of functions with limited variation. JULES SCHAUDER: Linear equations of the elliptic type with continued coefficients. TULLIO VIOLA: The trend of curves on which holomorphic functions of a uniformly converging suite take the same values as the limit function on a given curve. V. GANAPATHY IYER: A problem of Carleman. G. DELANGHE: The study of the balancing of machines with pistons by means of symmetrical rotating vectors. GEORGES MANEFF: The displacement of the perihelion of Mercury. The author's calculations lead to the same figure as those of Le Verrier and Grossmann (solution B). J. ELLSWORTH: The mass luminosity relation and double stars with eclipses. LOUIS LONGCHAMON: The mechanical properties of glasses. The method used is based on a study of the effects caused by the fall of a steel ball through different heights on to a plane horizontal sheet of glass. ERNST BAUMGARDT: A new optical method for the study of the absorption of ultrasound waves by liquids. The method is based on the theoretical interpretation of diffraction phenomena proposed by R. Lucas and P. Biquard. EDMOND ROUELLE: The influence of the initial charge of the condenser on the transitory phenomena obtained on closing a ferro-resonant circuit. P. BERNARD: The reversibility of piezoelectric phenomena. The results given show, in the case of variations of the order of 0.001 second and for pressures on the quartz up to 289 kgm./cm.², the reversibility on compression and decompression of the charges developed in the quartz. THÉODORE IONESCU and CONSTANTIN MIHUL: The propagation of electric waves: the explanation of echoes. PIERRE BRICOUT: The calculation of the perturbation of a hydrogenoid atom by a free electron. GEORGES LIANDRAT: The use of boundary type selenium photo-elements for the measurement and registration of very intense illuminations. G. LEJEUNE: The mode of action of controllers in scouring. Study of the effect of the addition of gelatine to acid solutions used for the removal of scale from iron. M. HAÏSSINSKY: The applicability of Nernst's electrochemical law to extremely dilute solutions. A study of the critical potentials of the cathode deposit of very dilute solutions of bismuth nitrate using the isotopes radium E and thorium C as radioactive indicators. A. HAUTOT: The structure of the K line of beryllium and conductivity electrons. PAUL GAUBERT: The anisotropy and structure of window glasses. WENLI YEH: Radioactivity induced by neutrons.

(To be continued.)

CRACOW

Polish Academy of Science and Letters, November 5. B. KAMIENSKI: Electric tensions of solutions of alkaloids, physiological agents. MILE. R. LUDWICZAK and J. SUSZKO: Studies on the relation between the rotatory power and atomic spatial

dispersions in the molecules of the cinchona alkaloids. J. FIEDZUSZKO and J. SUSZKO: Spatial transformations of the cinchona alkaloids into epimer bases. T. GIZA: Studies on casein. MILE. M. BREM: The distinction between the wood of spruce and larch by the anatomical method. A. BURSA: *Hydrurus foetidus* in the Polish Tatra. J. ZACWILICHOWSKI: The nerve elements of the haltere and the homology of the haltere and of the wing in *Tipula paludosa*.

PRAGUE

Czech Academy of Sciences and Arts, January 12, 1934.

B. NĚMEC: Heterophyly and heterotropy of ivy (*Hedera helix*). F. A. NOVÁK: *Pinus pindica* and *Pinus magellensis*. JAR. PETROK: *Corbicula fluminalis*, Müller, and the fauna of the Třebestovice pleistocene terrace in Čilce near Nymburk (paleontological part). V. SMETANA: *Corbicula fluminalis*, Müller, and fauna of the Třebestovice pleistocene terrace in Čilce near Nymburk (geological part). JAR. KLIKA: Plant societies on the travertine of Stankovany and their succession.

March 2. B. NĚMEC: Wood from the peat-bog at Františkovy Lázně. J. MATIEGKA and J. MALÝ: The physique of Albrecht of Valdštejn, Duke of Frýdlant. JAN WOLF: Polarity of the covering of cartilaginous cells. OT. PANKRAZ: The unification method of actuarial science.

April 13. FRANT. PATOČKA: Experimental study of the pathogenic possibilities of microbes such as bacillus anthracis. K. HRUBÝ: Contribution to the cytology and embryology of *Erythronium*. F. TOUL: Catalysis of the polymerisation of acetylene by ultraviolet radiation from mercury vapour. R. KOŠŤÁL: Oscillations of conjugated undamped torsion pendulums. JAR. PETROK: Molluscs of the Slovakian quaternary.

May 4. J. KOMÁREK: The luminescence of the Carpathian rain-worm and its cause. K. DUSL: Stability of the solution of Mathieu's differential equation. K. HRUBÝ and V. GOTTHARD: Biometry of the needles and cones of *Larix decidua*, Mill., *L. sudetica*, Dom., and *L. polonica*, Racib. J. H. KŘEPELKA and J. CHMELÁČ: Phosphorus poisoning and its detection by the Dusart-Blondlot test.

June 15. F. NĚMEJC: Some critical remarks on the Sternberg *Lepidodendron dichotomum*. V. RYPÁČEK: Contribution to the ecology of the Cladonia family. F. KRATOCHVÍL: Prehnites from the vicinity of Čáslav. J. JELÍNEK: Contribution to the question of the differentiation in the granite massif of Central Bohemia. A. KLEČKA and V. VUKOLOV: Contribution to the question of the mycorrhiza of grass and other meadow plants and its physiological significance. E. VOTOČEK and S. MALACHTA: A new transition from the sugar series to the furane series. F. VALENTIN: Anhydromannose, a new sugar anhydride. R. ŘETOVSKÝ: Uranyl nitrate and the energy of germination of old seeds of barley.

October 19. V. JIRÁSEK: Distribution of members of the *Poa*, L. family in the Czechoslovakian Republic. R. PEXIEDROVÁ: Projection of the accessory nasal cavities on the medial wall of the eye. R. LUKÁČ: Chemical and physical properties of some tremolites from the vicinity of Tábor and their genetic relations to the mother rock. FR. VYČIHLA: Linear straight-line complex as a three-dimensional variant.