

Science News a Century Ago

Researches on the Chemical Equivalents

ON February 14, 1839, Richard Phillips (1778-1851) who from 1839 until his death was chemist and curator of the Museum of Practical Geology, read a paper to the Royal Society entitled "Researches on the Chemical Equivalents of Certain Bodies". The paper was the result of a series of experiments made to test the truth of the theory of Dr. Prout and Dr. Thomson "that all atomic weights are simple multiples of hydrogen", a theory which the late Dr. Turner said was untenable. Turner having adopted the number 108 as the equivalent of silver, Phillips had selected this element as the basis for his inquiry into the equivalent numbers of chlorine and some other elementary gases. From his experiments, the author concluded that no material, and even scarcely any appreciable, error, could arise from considering the equivalent numbers of hydrogen, oxygen, nitrogen and chlorine as being 1, 8, 14 and 36 respectively.

Ehrenberg awarded the Wollaston Medal

AT the anniversary meeting of the Geological Society on February 15, 1839, the Wollaston Medal was handed to the Chevalier Bunsen for transmission to Prof. Christian Gottfried Ehrenberg, of Berlin, to whom it had been awarded for his discoveries respecting fossil Infusoria. "These discoveries," said Dr. Whewell, when handing the medal to Bunsen, "eminently striking and curious to all intelligent persons, are full of the most lively interests for geologists." They were, he added, a just reward of Prof. Ehrenberg's merits, "since he had prepared himself for this success by a profound study of natural history, by practical and scrutinizing researches, and by extensive and enterprising travels". In his reply, Bunsen said that the honour accorded "will be deeply felt by the whole literary public of Germany; it will, I trust, form a new link in that intellectual union between the two great and enlightened nations, which have so many objects of warm and deep sympathy; a union which must become every day more and more intimate, and prove productive of the most beneficial consequences, not only for the progress of science in the whole range of human intellect, but for the welfare of humanity at large".

Steel-making in India

DURING the discussion of a paper "On the Differences between the European and Indian Methods of Making Steel", at a meeting of the Asiatic Society on February 16, 1839, Mr. Heath, who had lately returned from the East, described the operations of the natives of India in manufacturing iron and steel. The ore used, he said, was the magnetic oxide of iron combined with quartz in the proportion of fifty-two of oxide to forty-eight of quartz, which occurred in the district of Salem. The ore was prepared by stamping and washing. The furnace was built of clay, charcoal was used as fuel, and the bellows were made of goat skins. The melting took about four hours and the product was hammered into bars. To convert the iron to steel, it was cut into small pieces and placed in crucibles with the dried wood of *Cassia auriculata* and a few green leaves of *Asclepias gigantia*.

Societies and Academies

Paris

Academy of Sciences (*C.R.*, 208, 133-236, Jan. 16, 1939).

E. BOREL: A continuous problem analogous to a card game.

M. MOLLIARD and R. ÉCHEVIN: Does the nature of the food affect the reserves [of plants]? Radish and viper's grass grown aseptically produce the same reserves whether levulose or glucose be applied to their roots.

A. GOSSET, R. JAHIEL and MME. S. DELAUNAY: Study of the evolutionary cycle of pneumonic illness in the rabbit, by local anaphylaxy, starting with endogenous proteins.

C. E. DIEULEFAIT: Moments of hypergeometric probabilities.

P. LÉVY: Division of a segment by a point chosen at random.

E. J. GUMBEL: Values of position of an aleatory variable.

P. VINCENSINI: A transformation of angle congruences of constant focal planes.

C. EHRESMANN: Paratactic congruences and parallelisms in projective spaces.

D. S. MITRINOVITCH: Theorem on Riccarti's equation.

J. MARCINKIEWICZ: Remark on M. Besikowitch's spaces.

C.-T. CHUANG: Holomorph functions in the *cercle unité*.

B. KWAL: Some relativistic generalizations of the fundamental equations of analytical mechanics.

R. GOUDEY: Measurements of the intensity of gravity in France during the year 1938.

G. PETIAU: Electromagnetic equations of the theory of the photon.

J. BASSET: Determination, under pressures of 1-11,000 kgm./cm², of an isotherm of naphthalene tetrahydride passing from the liquid to the solid state.

A. RASKIN: Construction of a high-tension generator with large output. An output of 800 microamp. can be obtained; the voltage, which is limited by local conditions, is 400,000.

G. REBOUL and F. PERRIER: A peculiarity of air ionized by X-rays. An effect can be detected several hours after the exciting rays are cut off, due apparently to 'large' ions which in number are about a million times fewer than those produced by the same X-rays.

N. KÜRTI, P. LAÏNÉ and F. SIMON: Adiabatic demagnetization starting from temperatures obtained with solid hydrogen. Using the great magnet of the Academy of Sciences, with a field of 29 kilogauss, a temperature of 0.36° K. was obtained in one stage with iron alum. Thus it is possible to dispense with liquid helium for work below 1° K. and hence the equipment required is simplified.

R. FORRER: Relations between the Curie point, orbital moment and crystal lattice.

L. NÉEL: Specific heat and fluctuations of the molecular field.

E. RENCKER: Properties of vitreous phenol phthalein.

L. GROVEN: Contribution to the study of the X-rays emitted in the discharge between external electrodes with maintained waves [of potential].

Mlle. M.-L. DELWAULLE, F. FRANÇOIS and J. WIEMANN: Study of the constitution of solutions of cadmium iodide; complete Raman spectrum of cadmium tetraiodide.

J. CATHALA and J. CLUZEL : Continuation of the spectrophotometric study of the slow hydrolysis of ferric salts.

P. BASTIEN : Influence of pH of acid solutions on the evolution as a function of time of the 'pickle' brittleness of extra soft annealed steel.

J. FARINEAU : Electronic structure of certain copper-aluminium alloys.

J. BOUGAULT, E. CATTELAÏN and P. CHABRIER : Nickel amalgams. Nickel can be amalgamated in the presence of nascent hydrogen, which seems to act as a catalyst.

R. CHAUVENET : Combinations of beryllium nitrate and the alkali nitrates.

Mlle. J. BRIGANDO : Study of ferricyanic, cobalticyanic and chromocyanic acids.

G. COURTOIS : Fusibility of mixtures of pure anhydrous sodium sulphide and sodium sulphate.

A.-A. SANFOURCHE : Magnesium hydroxy-apatite.

G. VAVON, J. CALIN and J. FOURCHIER : Action of halogen derivatives on magnesium couples.

R. JOUAN : A new method of production of crystals on which physical measurements can be made. A 'seed' crystal is supported in a supersaturated solution on artificial silk gauze carried on an oscillating glass frame.

L. BERTHOIS : Remarks on the origin of tourmaline in sedimentary rocks.

G. CHOUBERT : The Cretaceous of eastern Morocco.

M. THORAL and B. GÈZE : Structure of the western region of the southern slope of the Black Mountains (Aude-Hérault).

R. HUMERY : Piezometric surface of a sheet of water feeding any number whatever of artesian wells. A theoretical investigation.

J. MOUSSIEGT : Measurements of the conductivity and ionization of the atmosphere in the Alps (work of the Sanatorium des Étudiants de France, and of the chair of therapeutic hydrology and climatology of the Faculty of Medicine of Lyons).

G. GRENET and MME. P. QUENEY : Comparison of electromagnetic seismographs.

H. HUMBERT : An archaic genus of Cucurbitaceæ of Madagascar.

G. MANGENOT : Action of colchicine on plant cells. Colchicine immediately prevents cell proliferation though growth continues. This occurs before the appearance of giant nuclei.

A. MICHALSKI and F.-X. SKUPIEŃSKI : Ecological researches on *Physarum didermoides* Rost, an endospore myxomycete.

R. SOUÈGES : Embryogeny of the Cucurbitaceæ ; development of the embryo of *Bryonia dioica* Jacq.

J. REBOUL : General theory of the action of X-rays on biological elements. A revision of Crowther's formula is proposed.

M. PIÉRY, J. ENSELME, C. PESCHIERA and Mlle. M.-A. NOVA : Effect of the oxygen saturation of arterial blood on the production of lactic acid by striated muscle.

A. BESREDEKA : Antidiphtheric serotherapy by the cutaneous route. Antidiphtheric serum on the scarified skin of the rabbit is effective, even if applied several hours after penetration of the toxin.

P. LEPESME : Influence of temperature and humidity on the pathogeny of the aspergillosis of Acridians.

Geneva

Physical and Natural History Society (November 17, 1938).

A. PICTET : Geographical distribution of organisms and the problem of transformism. Studies in the field and laboratory suggest that there is a relationship between geographical separation and racial chromosomal constitution, separation having created germinal differences. This view puts the process of transformism back to early geological times before the continents were separated.

M. PERROT : The chromosomes of *Archelix* and of *Alabastrina Alabastrites* Michaud. The chromosome number of *A. Alabastrites* is different from that in the three other species of *Archelix*. It is concluded that the genus *Alabastrina* of Kobelt is artificial, since it contains species related to *Archelix* and others which should be placed in another group.

J.-L. PERROT and M. PERROT : Chromosomes of five species of *Limnea*. Chromosome number of *L. auricularia*, *ovata* and *peregra* is 17; that of *L. palustris* and *stagnalis* is 18. This confirms the classical arrangement of the first three species in the subgenus *Radix*. The parallelism between the chromosomal homogeneity and the great resemblance of conchological and anatomical characters is also emphasized.

J.-L. PERROT : Is self-fertilization possible in *Eulota fruticum* Müller? In contrast to a nearly related species, *E. similaris stimpsoni*, self-fertilization is not possible.

M. L. MISCH and A. J. A. VAN DER WYK : Structure of oxamide. X-ray study of crystallized oxamide shows that it belongs to the triclinic system. Cohesion in the *ac* plane is very great; this accounts for the special physical properties of oxamide.

December 1, 1938.

A. PICTET : Localization of physiological races of Lepidoptera in the Swiss National Park as a function of altitude and of the flora. The topography and diversity of soils and flora of the Park have localized individuals (of *Nemeophila plantaginis*) in autonomous stations, where they retain their own physiological and genetic characteristics from year to year.

H. BRANDT and W. SCHUSSELE : Researches on vitamin C during athletic effort. Vitamin C, or more strictly the reducing power of the urine in the dichlorophenol-indophenol reaction, may increase or decrease after exertion. The same subject always gives the same reaction, which appears to be a constitutional factor.

December 15, 1938

B. SUSZ and E. BRINER : Absorption by benzoic aldehyde in the violet and the near ultra-violet. The coefficient of extinction between 3820 Å. and 4060 Å. has been measured, after elimination by extrapolation of the effect of the benzoic acid always present in small concentration.

P. ROSSIER : Choice of the resistance of the induced circuit in measurements with the ballistic galvanometer. Case of critical damping when the galvanometer deflection is a maximum.

F. CHODAT : Study of chloroplasts by the method of formation of starch *in vivo*. Transformation of starch formed by the chloroplasts, by warming, permits the demonstration of the heterogeneous structure of the chloroplasts; after this treatment they show a series of granulations.