

Science News a Century Ago

The Scientific Congress in France

Quoting from *Galignani's Messenger*, the *Times* of September 22, 1834, recorded that "The Scientific Congress, which has been sitting at Poitiers has closed its session. The number of its members amounted to 230". Among the questions discussed was that of the policy of employing troops on public works such as roads, while the agricultural section presented a resolution that "Salt may be beneficially used in the feeding of cattle, and in improving land, consequently the tax upon this article, which prevents it being so used, ought to be reduced". The Congress was deeply concerned with "the immorality which degrades many of the literary productions of the present day"; and it declared that "the French Academy at Rome should be suppressed being no longer of any utility". The proceedings of the Congress, it was said, have proved that the institution cannot fail to increase the welfare and happiness of society, and it was decided that the next meeting should take place at Douai in 1835.

Opening of Leeds and Selby Railway

One of the oldest sections of the London and North Eastern Railway is that from Leeds to Selby about twenty miles long. Authorised in May, 1830, it was constructed by J. U. Rastrick (1780-1856) and was opened on September 22, 1834. The first train left Leeds at 6.0 a.m. drawn by an engine of 18 horsepower named *Nelson*. "To this were attached," says the *Annual Register*, "three of the first class carriages, and six carriages of the second class, the former carrying eighteen passengers each and the latter twenty-four. The requisite preparations having been completed, a start was made; but, the rain having rendered the tram-rails so slippery that the wheels of the engine turned round at times without any sensible locomotion, only two miles were completed in a space of forty minutes. It was, therefore, thought advisable to lessen the drag of the machine as much as possible; and with that view the passengers, who occupied the six second class carriages, were stowed into five of them, and the sixth was left behind. The engine, however, proceeded at the same slow pace for some time longer, amid the jeers and laughter of the bystanders, who called to the police officers and others attendant upon her, to put their shoulders to and push her along". After stopping at Garforth viaduct "the engine shot away with her load, and did the remaining fourteen miles in forty-two minutes, being at the rate of twenty miles an hour". The whole journey occupied two hours and twelve minutes, but the return journey was made in one hour sixteen minutes. Within a year of its opening, the railway, says Sherrington, had in operation combined rail and water passenger fares between Leeds and Hull, and combined rail and road fares between Leeds and York, both through Selby.

Chemistry Lectures at the Royal Institution

In an advertisement in the *Times* of September 27, 1834, under the heading "Royal Institution of Great Britain" it was announced that "The extended and practical Course of Chymical Lectures and Demonstrations for medical and general students delivered in the Laboratory of this Institution, by Mr. Brand and Mr. Faraday, will commence on Tuesday, Oct. 7,

at 9 o'clock in the morning, and will be continued on Tuesdays, Thursdays and Saturday at the same hour. Two courses are to be given during the season, which will terminate in May. For prospectus of the lectures and terms of admission application may be made to the Lecturers or to Mr. Fincher at the Royal Institution". Joseph Fincher was then the assistant secretary of the Institution. Speaking of the lectures, the physician Thomas Gordon Hake (1809-1895) in his "Memoirs of Eighty Years", published in 1892, said: "There was no medical school at St. George's, the anatomical students went to Great Windmill St., where Mr. Caesar Hawkins lectured and taught. The chemical students went to the Royal Institution in Albemarle Street, where Faraday and Brand were professors. The lectures were then delivered at eight in the morning; beautiful and perfect they were; the attendance was very thin. I am proud to remember that I imbibed my first ideas of chemistry at such a fountain head. Faraday was most charming, most unpretending; his experiments never failed, nor did those of his colleague who was a model lecturer; gentlemanly, perfect of expression, exact of execution."

Societies and Academies

PARIS

Academy of Sciences, July 30 (*C.R.*, 199, 329-392). GEORGES CLAUDE: A floating Claude-Boucherot installation. D'ARSONVAL: A visit to the Tunisie. Remarks on the Claude-Boucherot installation for utilising the thermal energy of the sea. NATAN ARONSAJN: Dirichlet's series with linearly independent exponents. EUGENE REMES: The effective calculation of Tchebitchef's polynomials of approximation. STEFAN BERGMANN: Integral and meromorph functions with two complex variables. GEORGES ALLARD: A general method of statistics applicable to indiscernible particles. A method for obtaining the law of statistical distribution of the molecules of a gas. This is an extension of Planck's method, and allows a closer analysis than the methods of Bose-Einstein and of Fermi-Dirac. PIERRE LEJAY: Gravity observations in Malaya, the Dutch Indies, Cambogia and Cochin China. Proof that work done with the Holweck-Lejay pendulum is in close agreement with that of Vening Meinesz. D. G. DERVICHIAN: Polymorphism in the monomolecular layers of fatty acids at the surface of water. THEODORE KAHAN: The thermal variation of the structural demagnetising factor in nickel and cobalt. The existence of the structural demagnetising field in nickel and cobalt is confirmed by evidence of its thermal variation. The factor of this field decreases as the temperature rises. MORICE LETORT: The kinetics of the thermal decomposition of the vapour of acetaldehyde. The true order of the reaction, derived from the initial data, is 1.5: a higher value, approximately 2, results from the wall effect. WILFRIED HELLER: The coagulation of hydrophobe sols by freezing in relation with mechanical coagulation. ANDRE DE PASSILLE: Study of the dissociation of the ammonium phosphates. Data are given for the dissociation of $(\text{NH}_4)_2\text{HPO}_4$ and anhydrous $(\text{NH}_4)_3\text{PO}_4$. The study of the dissociation of the latter proves the existence of a compound $(\text{NH}_4)_5\text{H}(\text{PO}_4)_2$. RENE PERROTTE: Ricinic acid and 12-ketostearic acid. M. TIFFENEAU and MLE.

B. TCHOUBAR: Transpositions in the cyclohexane series. The migratory aptitude of the migrating radical is influenced by its position in space. EDMOND URION: The oxidation of Δ -1-methylcyclohexene by selenious acid. GEORGES DUPONT and WITOLD ZACHAREWICZ: The *cis* and *trans* isomers of myrtanol. GEORGES MIGNONAC and ERWIN DITZ: The polymerisation of acetylene under the influence of heat. A yellow gaseous hydrocarbon, chlorene. The acetylene is passed in a rapid stream through a quartz tube at 750° C. and the products immediately cooled to -70° C. Two dimers of acetylene possessing the composition C_4H_4 were isolated, one of which possesses the remarkable property of being greenish yellow in the gaseous state: the name of chlorene has been given to it. JEAN HERBERT: Study of the corrosion figures of glass. The corrosion figures of glass change with the mode of attack, and have nothing in common with the figures formed when crystals are attacked by an appropriate reagent. The figures change with the concentration of the hydrofluoric acid used. G. DENIZOT: The structure of the Canary Islands considered in relation with the problem of Atlantis. The submersion of the Atlantic area was complete about the middle of the Tertiary period. Afterwards, the accumulation of volcanic products caused emergence from the sea at some points, and at times, relations with the African continent were possible. ANTONIN LANQUINE: Breaches of the Provençal chains at the borders of the northern and eastern Varois regions. R. FAILLETTAZ and R. BUREAU: The records of atmospheric at Tamanrasset (Hoggar) in the course of the Polar Year. F. RATHERY and P. M. DE TRAVERSE: Perfusion of the intestine, and glycolysis. GEORGES BOURGUIGNON: Extemporaneous variations of the chronaxy under the influence of the pain caused by chronic rheumatism. MLADEN PAIC: The rotatory dispersion of the sera of normal and syphilitic rabbits. The suggestion by Rondoni, that the rotatory power of the serum was of value in the diagnosis of syphilis could not be confirmed. MAURICE LEMOIGNE and ROBERT DESVEAUX: The origin of the nitrogen deficit in aerobic microbial cultures. The nitrogen deficiency is due to a transformation, probably an oxidation, of the ammonia arising from the decomposition of the proteins of the medium. HARRY PLOTZ: The filtrability of the tubercle bacillus. Utilising the method of electrophoresis, experiments are described proving that the tubercle bacillus can pass through the L_2 Chamberland filter. This, in the author's opinion, is the true origin of what has been called the tuberculous ultra-virus. CHARLES SANNIE and JEAN VERNE: Study of the toxic action of cations on the cells of various organs cultivated *in vitro*.

ROME

Royal National Academy of the Lincei, April 8. G. BRUNI and M. STRADA: New methods for separating heavy water $H_2^{18}O$ from ordinary water $H_2^{16}O$. Increase of the heavy water contained in ordinary water may be effected by fractional freezing. Also, large natural carnallite crystals from Stassfurt and Beienrode yield water showing as much as 0.4 per cent of D_2O . L. CAMBI and A. CAGNASSO: Complexes of metals of the first transition series with dipyrindyl and phenanthroline. M. CAMIS: Vitamin content of certain African cereals (1). Existence of the B complex. Experiments on pigeons show that vitamin B is present in *Eragrostis tef*, and *Sorghum aethiopicum*

and, to a less extent, in *Pennisetum spicatum* and *Eleusine coracana*. A. PALATINI: Saint-Venant's conditions in any V_n . W. BLASCHKE and E. BOMPIANI: Enumerative reasoning on mixed textiles (*tessuti misti*). S. BERGMANN: Certain properties of transformations by a pair of functions of two complex variables. L. SOBRERO: Application of hyper-complexes to the problems of plane elasticity (3). M. VILLA: Hyper-algebraic hyper-surfaces. B. SEGRE: The moduli of irregular algebraic surfaces. M. RENATA FABBRI: A particular movement of a heavy solid about a fixed point (limit of variability). G. L. ANDRISSI: The system 61 Cygni. Calculations made with the help of the measurements available indicate that the orbit of this double is hyperbolic, but the observations are too few to permit of the calculation of the orbit. A. BARONI: Alloys of lithium and cadmium. A reply is made to recent criticism by Zintl and Schneider of the results of the author's X-ray examination of these alloys. C. COLOMBI and L. PAOLAZZI: Splenic leuco-cateresis.

SYDNEY

Linnean Society of New South Wales, May 30. LILIAN FRASER: An investigation of the sooty moulds of New South Wales (2). An examination of the cultural behaviour of certain sooty mould fungi. Representatives of all types of sooty mould fungi, with controls, were grown on agar media containing a variety of different food materials. The results of these experiments are presented and discussed. H. L. JENSEN: Contributions to the microbiology of Australian soils. (1) Numbers of micro-organisms in soil, and their relation to certain external factors. Counts of bacteria, actinomycetes and fungi in fifty soils from New South Wales, and periodical counts of the same groups of micro-organisms in a soil from Sydney are recorded. The relation of the numbers of micro-organisms to humus content, soil reaction, moisture content and temperature is discussed. Humus content and moisture are shown to be the most important factors in governing the numbers of micro-organisms. H. M. R. RUPP: The habitat, character and floral structure of *Cryptanthemis Slateri* (Orchidaceae). The supposed association of *Cryptanthemis* with the tuberous roots of *Dipodium punctatum*, R.Br. has been found to be apparent rather than real, and is not constant. It has been established that the flowers are developed and matured beneath the actual surface of the soil; but after maturity, elongation of the rhizome appears to bring the withered capitulum level with the surface, beneath accumulations of debris. The details of the floral structure were established by careful examination of fresh flowers before they suffered any ill-effects from exposure.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, 20, 251-321, May 15, 1934). MARSTON C. SARGENT: Causes of colour change in Blue-green Algae. *Gloeocapsa montana* was cultivated in an inorganic medium in flasks standing in a glass-bottomed water-bath over various sources of light. The cycle of colour changes from dark blue-green in low intensity light to buff in high intensity light could be repeated several times with a single culture. Colour is dependent primarily on intensity of illumination; colour of incident light, temperature and composition of medium have minor

effects. W. BAADE and F. ZWICKY: (1) On super-novæ. Two types of novæ are recognised: (a) common novæ; (b) super-novæ. The former are fairly frequent in certain systems; the latter have appeared in all stellar systems at long intervals, and at maximum brightness emit nearly as much light as the whole nebula in which they originate. Tycho Brahe's nova of 1572 was probably a super-nova of the Milky Way. It is considered that the appearance of a super-nova represents the rapid transition of an ordinary star into a body of much smaller mass. (2) Cosmic rays from super-novæ. Assuming that cosmic rays are related to a sporadic process, such as the 'flare-up' of a super-nova, the intensity of such rays reaching the earth can be derived; the computed intensity is in fair agreement with that obtained by direct observation. The view is advanced that a super-nova represents the transition of an ordinary star to a neutron star, of very small radius and extremely high density, with emission of cosmic rays. EDWIN HUBBLE and MILTON L. HUMASON: The velocity-distance relation for isolated extra-galactic nebulae. These nebulae show the same relationship as the cluster nebulae; hence their luminosity functions are closely similar. H. H. PLOUGH and P. T. IVES: Heat induced mutations in *Drosophila*. Exposure of larvae for 24 hours to a temperature of 36° C. produces six times the number of mutations observed in controls, thus confirming the general results of Goldschmidt and Jollos. The number of mutations is approximately the same whether male or female parent is heated, and is doubled when both are heated. Increased tendency to produce somatic modifications is inherited, but only through the female line. CLYDE E. KEELER and W. E. CASTLE. Blood-group incompatibility in rabbit embryos and in man. Of the two agglutinins of rabbit blood, the embryos contain the same agglutinin as the mother, probably via the placenta, unless they have inherited the other agglutinin from the father. A maternal agglutinin is neutralised in an embryo containing the antagonistic agglutininogen, but the process is gradual and no blocking of the circulation occurs. A similar process probably applies in man. FRANK H. CLARK: Linkage studies of brachyury (short tail) in the house mouse. No linkage was detected with any of the fourteen other mutant genes generally recognised as being inherited independently. EDWARD W. BERRY: Miocene Patagonia. Preliminary studies of a collection from the valley of the Rio Pichileufu, at lat. 41° 10' S. and long. 70° 52' W. The plant remains are almost entirely of leaves, chiefly of dicotyledons, with a few cyprinodont fish scales and beetle elytra. The plant species confirm generally the findings from Mirhoja, lat. 44° 20' S., long. 70° W. that the flora is a mixture of mesophytic and drier soil types, which enjoyed greater and better distributed rainfall and a more genial climate than the present flora. It is also typically American. MARSTON MORSE and EVERETT PITCHER: On certain invariants of closed extremals. G. A. MILLER: Confusions in the use of the mathematical term group. F. A. SAUNDERS, E. G. SCHNEIDER and EMILY BUCKINGHAM: The strontium II and barium II spectra. CHARLES HAIG: The effect of intensity and wave-length on the response of *Avena* to light. For short exposures (1 sec.) and white light, reaction time decreases with increasing intensity up to 100 millilamberts and then increases. The response curves are rectangular hyperbolæ and in two parts, indicating two photoreceptor processes, which are found, by using partially shielded seedlings,

to be located near the tip and base of the stem respectively. The relative sensitivities of these regions to light of different colour are different. T. W. TORREY: Temperature coefficient of nerve degeneration. The results suggest that degeneration is mainly a chemical process. G. H. PARKER: The prolonged activity of momentarily stimulated nerves. Severing one or more long rays in the tail of a catfish or killifish, causes the melanophores in the radial band thus denervated to assume a state of dispersed pigment producing a marked dark band. This condition persists for a day or so to a week. A fresh cut within the dark band produces a secondary dark band; adrenalin causes all the bands to fade quickly, but as its effects wear off, the bands reappear. A 'cold block' applied to a band also causes it to fade. It is concluded that the nerves concerned remain active for periods up to days after severances from their centres. CLARENCE W. BROWN and FRANKLIN M. HENRY: The central nervous mechanism for emotional responses (2). A technique for destroying the deeper nuclear regions within the cerebrum with a minimal destruction of the intervening cortex. A radio frequency current of 3×10^6 cycles generated by a vacuum tube oscillator was used. The electrode adopted consisted of a nickel silver wire coated with bakelite (outer diameter 0.014 in.) and ground to a smooth point. By this means, regulated destruction of deep-seated nuclei can be achieved, while 'restraining' centres in the cortex are uninjured. T. C. SCHNEIRLA: Raiding and other outstanding phenomena in the behaviour of Army ants. Ants of the genus *Eciton* form temporary colony clusters or 'bivouacs' and move off ('raid') in either 'swarms' or 'columns' according to species. A colony remains 'bivouacked' in a given place (statory condition) when eggs are present and also for about three weeks while the young are in cocoons; otherwise they make a new 'bivouac' every evening (nomad condition). The raids show two peaks of activity, in the morning and afternoon respectively.

Forthcoming Events

Saturday, September 29

MICROCHEMICAL CLUB, at 11 a.m. Second meeting to be held at the University of Reading.

NATIONAL SMOKE ABATEMENT SOCIETY, September 27-29. —Sixth Annual Conference to be held at Glasgow. Dr. H. A. Des Voeux, President.

FARADAY SOCIETY, September 27-29. General discussion on "Colloidal Electrolytes", to be held at University College, London. Discussion to be introduced by Prof. H. Freundlich.

Official Publications Received

GREAT BRITAIN AND IRELAND

The Economic Proceedings of the Royal Dublin Society. Vol. 2, No. 32: Weathering of the Stonework of the National Museum and of Government Buildings. By A. G. G. Leonard and James Ginnell. Pp. 529-532. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.) 6d.

Scottish Society for Research in Plant-Breeding. Report by the Director of Research to the Annual General Meeting, 26th July 1934. Pp. 30. (Edinburgh.)

OTHER COUNTRIES

Report and Balance Sheet of the National Botanic Gardens of South Africa, Kirstenbosch, Newlands, Cape (and the Karoo Garden, Whitehill, near Matjesfontein), for the Year ending 31st December 1933. Pp. 27. (Kirstenbosch.)

Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. 86. Zoological Results of the Matto Grosso Expedition to Brazil in 1931. 3: Birds. By Witmer Stone and H. Radcliffe Roberts. Pp. 363-397. (Philadelphia.)