

## Science News a Century Ago

### Launch of S.S. *John Randolph*

On July 9, 1834, the *John Randolph*, the first iron steam vessel in the United States, was launched on the Savannah River. She had been built by John Laird at Birkenhead and sent to the United States in sections. She was 110 ft. long, 22 ft. beam, and drew about 2½ ft. Her tonnage by the builders' old measurement rules was about 250 tons. Her engines, of 60 horse-power, had been made by Fawcett, Preston and Co., of Liverpool. The first iron vessel had been built so long before as 1787, but iron shipbuilding made slow progress. There were many objections raised against the use of iron, but practical experience proved most of them to be ill-founded. In the end, iron ships proved lighter and faster than wooden ships, cargoes could be stored more easily and kept in better condition in them, they were more easily repaired, and when fitted with water-tight bulkheads were far safer. The pioneers of iron shipbuilding in Great Britain included John Grantham, Sir William Fairbairn and David Napier, but none did more important work in this direction than John Laird.

### Death of Capt. David Thompson

"We have just received the intelligence," said the *Athenæum* on July 12, 1834, "of the decease at Mauritius of the well-known computer and author of the Lunar and Horary Tables and inventor of the Longitude Scale, in consequence of severe injuries received during the hurricane which recently devastated that colony.

"The work which brought Captain Thompson's name into notice among men of science, is his solution of the problem, of clearing the apparent distance of the moon from other celestial bodies, from the effects of parallax and refraction—one of the most useful in nautical astronomy; and he received from the late celebrated Baron de Zach, high commendation for his skill and success in this investigation, and from the late Board of Longitude, a tardy acknowledgement of the high merit of his Tables. . . ."

### David Douglas, 1798–1834

On July 12, 1834, David Douglas, the Scottish botanical collector who discovered 'Douglas spruce', was killed in the Sandwich Islands. On an excursion he inadvertently fell into a pitfall set for wild cattle and was gored to death by a bull. Born at Scone in Perthshire, the son of a stone-mason, he became a gardener, and while employed at the Botanical Gardens, Glasgow, attracted the attention of J. W. Hooker, then professor of botany, and accompanied him on some of his expeditions. He was recommended to Sabine, the secretary of the Royal Horticultural Society, and sent to the United States, where he procured many fine plants. Sent out again in 1824, during the next three years he went as far as north California and the River Columbia, and then made his way to Hudson's Bay, whence he returned with Sir John Franklin. It was during this expedition that he discovered the spruce which bears his name. His third and last expedition began in 1829. After spending a part of the years 1832–34 on the Fraser River, he sailed for the Sandwich Islands. It is said he introduced into Great Britain fifty-three new woods and one hundred and forty-five new herbaceous

plants of a hardy nature. He was a fellow of the Linnean, Geological and Zoological Societies and after his death the botanists of Europe erected a monument to him at Scone. A monument to him was also erected in the cemetery at Honolulu by J. L. Brenchley (1816–73), the traveller.

## Societies and Academies

### LONDON

Royal Society, June 28. W. L. BRAGG: The structure of alloys (Bakerian Lecture). An alloy phase has two characteristics. The first is the pattern of sites occupied by atoms irrespective of their nature. Each phase of an alloy system has a different pattern of sites, and therefore a change from one phase to another involves their complete re-arrangement. The second characteristic is the distribution of the atoms amongst these sites. This distribution may vary continuously without change of phase, from being random at high temperatures to being partially regular at low temperatures. The alloy is a system of dynamical equilibrium. Although interchange of atomic position at room temperature is infrequent, the alloy has received its character at some previous point in its history when the temperature was just sufficiently high for interchange to be important. Maxima and minima in physical properties at certain relative proportions, such as Fe<sub>3</sub>Al and AuCu<sub>3</sub>, are statistical effects, and do not imply the existence of corresponding compounds.

Royal Meteorological Society, June 20. SIR NAPIER SHAW: The natural history of weather. The paper describes an arrangement of the meteorological data for a station with special reference to the encouragement of the study of Nature. I. S. ASTAPOWITSCH: Air waves caused by the fall of the meteorite on June 30, 1908, in Central Siberia. The results of the barograph records obtained by the author at the time of his research expeditions of 1930 and 1932 are given. The time of fall of the meteorite and the force of the explosion were determined by examination of various independent sources. The air wave must have been recorded by microbarograms in Japan, China, India and perhaps America. F. J. W. WHIPPLE: Phenomena related to the great Siberian meteor. This paper is supplementary to one published by the author in 1930. Additional evidence with regard to the illumination of the sky during the nights following the arrival of the meteor is summarised. In view of the fact that recorded observations of this phenomenon are confined to the north of Europe, the meteor probably had a tail which was to be captured by the earth's atmosphere. The air waves produced by the meteor were recorded at Batavia and at Washington as well as at several places in Europe. S. E. ASHMORE: The splashing of rain. The connexion between the rate of rainfall and the splashing produced by it from a horizontal surface has been studied experimentally for a large number of surfaces which may be used as the surroundings for rain-gauges. The splashing from ice and water has also been investigated. W. R. BALDWIN-WISEMAN: The cartographic study of drought. This paper presents a method of setting out rainfall statistics for drought periods. In order to illustrate this method the famous drought in Queensland during 1902 has been investigated. Maps are

given defining the progress of this drought, the rainfall being expressed as deficiencies from the average for groups of consecutive months.

## PARIS

Academy of Sciences, May 14 (*C.R.*, 198, 1729-1820).  
 Gustave Moussu was elected a member of the Section of Rural Economy in succession to the late E. Roux.  
 KAROL BORSUK: The idea of the category of L. Lusternik and Schnirelmann. SPYRIDION SARANTOPOULOS: The existence of holomorph integrals of differential equations of the first order in singular cases. BEPPO LEVI: Ensembles of points which cannot be ensembles of zeros of an analytical function of several variables. ANTONIO MONTEIRO: Additive nuclei in the theory of integral equations of Fredholm. ANDRÉ WEIL: A characteristic property of groups of finite linear substitutions. ELIE CARTAN: Remarks on the preceding communication. STEFAN BERGMANN: Integral and meromorph functions of two complex variables. M<sup>lle</sup>. M. RENATA FABBRI: Isoconic rotations. P. SWINGS and B. EDLÉN: The presence of the forbidden lines of Ne V in the spectra of nebulae. R. MAZET: A new definition of the forces of control. HENRI PONCIN: The sudden local variations of density in fluids in motion. J. BERNAMONT: The fluctuations of resistance in a metallic conductor of small volume. M. GUILLOT and M. HAÏSSINSKY: The effect of strong concentrations of electrolytes on the potential of the deposit of polonium. A. MICHEL-LÉVY and H. MURAOUR: The luminosity of waves of shock. A luminous effect (shown in reproductions of photographs) is produced when two shock waves meet and also when a single shock wave meets an obstacle. The spectrographic study of this phenomena is being investigated. M<sup>lle</sup>. CÉCILE STORA: The relation between the curve of spectral sensibility and the curve of absorption in photocells with colouring matters. By comparison of the sensibility and absorption curves, it is shown that the photosensitive layer is formed of a very thin pellicle of colouring matter. The energy absorbed by this pellicle is responsible for the variation of potential under the action of light. M<sup>me</sup>. BRANCA EDMÉE MARQUES: The fractional precipitation of radiferous barium sulphate. A study of the behaviour of the system barium-radium sulphate under different conditions of precipitation. The errors due to filtration are avoided by the use of the centrifuge. The Doerner and Hoskins law holds for the case of slow precipitation. The fractional precipitation of radiferous barium salts by sulphuric acid is less efficient from the point of view of the separation of the radium than the fractional crystallisation of the bromides and chlorides. J. FERREU: The thermochemistry of aqueous solutions of nickel sulphate. M<sup>lle</sup>. M. G. ADOLFF and H. HERING: The heterogeneous equilibria in the system: cadmium chloride, sodium chloride, water. A. P. ROLLET and J. WOHLGEMUTH: Study of the binary system: water, lithium hydrazoate. HENRI MULLER: Applications of the method of the lowering of eutectic points. WILFRIED HELLER: The conditions of a mechanical coagulation. IVAN PEYCHÈS: Contribution to the study of beryllium tartrate. The results of measurements of the rotatory power. ANDRÉ DE PASSILLÉ: The method of preparation of pure arsenic. Ammonium arsenate, after purification by repeated recrystallisation, is reduced by heating in ammonia at 1,000° C. and freed from traces of the oxide by sublimation. The arsenic thus obtained proved to be spectro-

scopically pure. GEORGES DENIGÈS: A new reaction of cantharidine, applicable to its estimation by colorimetry. The method is based on the brown coloration produced by heating with formol and sulphuric acid. E. M. BELLET: The alcoholysis of glycerol triacetin in weak alkaline solution. HENRI RAVIER: Phenyltrimethylglycerol and some chlorhydrins of tetrasubstituted glycerols. A. ABLOV: The influence of the electric moment on the number of molecules of base fixed by a salt. C. LEFÈVRE and CH. DESGREZ: Contribution to the study of the organic sulphides. MICHEL FLANZY: The formation of formaldehyde in the oxidation of ethyl alcohol. The production of formaldehyde as an oxidation product of pure ethyl alcohol is proved: the presence of methyl alcohol is not proved by this reaction. M<sup>lle</sup>. SIMONNE CAILLÈRE: Observations on the chemical composition of the palygorskites. RAYMOND FURON and CONRAD KILLAN: The Primary and Cretaceous between Tibesti and Air. J. GAUZIT: Concerning the theoretical discussion on the distribution of ozone in the atmosphere and the *Umkehr-effekt*. J. VELLARD: The periodic destruction of the fauna of the rivers of the Grand Chaco by variations of salinity. The fish die as the salinity increases through evaporation and are deposited in enormous blocks. This is of interest from the geological point of view as it gives a possible explanation, better than any other hypothesis, of the formation of certain banks of fossil fishes, the origin of which is otherwise difficult to understand. ALPHONSE MALAQUIN: New observations on the germinal strain of the annelid *Salmacina Dysteri*. M<sup>lle</sup>. M. L. VERRIER: The action of light on visual purple. The decolorising action of light is only appreciable if working with retinas poor in visual purple or on very dilute solutions: if the visual purple is abundant the action is practically nil. These results are difficult to reconcile with the current view of the mechanism of the visual purple. JACQUES POCHON: The influence of the culture medium on the biological properties of a cellulolytic bacterium from ox stomach. BORDIER: The measurement of the lucimetric index of a given place by a helio-chromometer. The measurement is based on the amount of iodine set free from a solution of iodoform in chloroform. B. S. LEVIN: The influence of oxygen on the antitoxic action of cholesterol on the saponins. MICHEL POLONOVSKI, PAUL BOULANGER and GASTON BIZARD: The formation of ammonia at the expense of aminoacids in the kidney of the dog *in vivo*. An important proportion of the urinary ammonia arises from the natural aminoacids.

## LENINGRAD

Academy of Sciences (*C.R.*, No. 7). S. BERNSTEIN: The linear quasi-continuous chains of Markov. I. VINOGRADOV: Distribution of primitive roots. S. MICHLIN: Dirichlet's problem for a domain with several closed boundaries. D. SHERMAN: A problem of the theory of elasticity for domains with multiple connexions. A. POPOV: A note to the paper by V. Fock "Zur Berechnung des elektromagnetischen Wechselstromfeldes bei ebener Begrenzung" (*Ann. Phys.*, 17, 4; 1933). V. PAJEVSKIJ: A general expression for the probability of survival under the mortality conditions of a given calendar period. For practical computation, the following formula may be used:

$$q_{12}^2 = q_{12} - 2 \cdot 4 \frac{l}{n} (6q_2 - q_{12}),$$

where  $q_2$  and  $q_{12}$  denote the values of probabilities of dying before the age of 2 and 12 months respectively,  $l$  the monthly increase in the number of births, and  $n$  the average monthly number of births. M. BRONSTEIN: The relativistic generalisation of the principle of uncertainty. G. KRUTKOV: Contribution to the theory of Brownian movement. On the function  $f(v, x, t)$  and the equation of the diffusion. V. KUZNETSOV, D. KONVISAROV and V. STROKOPYTOV: The increase in the plasticity of metals during plastic twisting in alternating directions. K. ANDREJEV and J. CHARITON: Some considerations on the mechanism of self-propagating reactions. A certain minimum degree of localisation of the reaction energy is necessary for the self-propagation of the macro-chain. M. KAZNELSON and M. KABACHNIK: Amidation with the help of sodium and potassium amides in the alkaloid series (1). On the  $\alpha$ -aminoanabasin. V. SADIKOV, V. VADOVA and R. KRISTALLINSKAJA: The use of  $H_2SO_4$ ,  $HCl$ ,  $H_3PO_4$ ,  $HNO_3$  and of alkalis in the catalytic splitting of proteins. I. LIASCHENKO: Flowering in the genus *Cucurbita*. Description of hermaphrodite flowers observed in four different species. N. KALABUCHOV: 'Anabiosis' in vertebrates and insects at a temperature below zero. At temperatures of  $-3^\circ$  to  $-10^\circ C.$ , metabolic exchange continues, though very slowly; consequently, the state of prolonged undercooling is only a profound torpor, and not a complete cessation of the vital processes understood by 'anabiosis'. L. VARDANIANC: On the age of the surface relief of Ciscaucasia. The conformation was produced only in the post-Pliocene.

## ROME

Royal National Academy of the Lincei, Jan. 21. S. MINETTI: Riccati's differential equation and certain results in differential geometry. A. MYLLER: The flexion of scored surfaces. L. SOBRERO: A new hypercomplex variable of interest in the theory of elasticity (1). R. CACCIOPOLI: Elliptic equations with partial derivatives, with  $n$  independent variables. Various simple fundamental results concerning linear equations of elliptic type are established. E. BOMPIANI: Determination of the hyperspatial surfaces for a triply infinite system of normal rational curves. R. ZAÏCOFF: Generalised wave mechanics. F. P. MAZZA and L. PANNAIN: Mechanism of the action of histozyme. This enzyme is distinguished from the carboxypeptidases, as it unites, not with the free carboxyl group of the substrate, but with the nitrogen of the  $CO.NH$  bridge. The different activities it shows towards aliphatic and aromatic alcy derivatives are probably due, not to the existence of two different enzymes, but to varying velocity of the hydrolysis catalysed by the enzyme. F. PIRRONE: (1) Studies on indones. Synthesis of  $\beta$ -phenyl-1:2-naphthoindene-11-one. (2) Investigations in the field of high frequency. Biochemical action of ultra-short electromagnetic waves (1). Exposure of brewers' yeast in aqueous suspension to the oscillations of a Hertzian resonator capable of oscillating on the fundamental wave of  $\lambda = 1.885$  metre reveals a slow accelerating action on the development of the yeast. The effect is slight after 1-2 days, but becomes marked after 6-7 days. G. BINI: Determination of the characteristic nitrogen groupings in the muscular tissue of *Mullus barbatus*, L. The proportions of the total nitrogen of this tissue existing as lysine, histidine, arginine, etc., have been determined by the van Slyke method. C. SIBILLA: Sexuality in certain species of the genus *Chaetomium*.

This genus includes many homothallic species, and experiments are being made to ascertain if such homothallism is absolute or prevalent. A. DE AGAZIO: Action of strychnine and strophantine on the isolated heart of *Bufo vulgaris*. ELENA J. ROLAND: Existence of a large sebaceous gland in the external auditory canal of native *Mus* species.

## Forthcoming Events

- ROYAL SANITARY INSTITUTE, July 9-14.—Health Congress to be held at Bristol. Dr. Stanley H. Badock: President.
- INSTITUTION OF NAVAL ARCHITECTS, July 10-13.—Summer meeting and International Conference on Experimental Tank Work. Right Hon. Lord Stonehaven: President.
- SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES, July 11-14.—Annual Congress to be held at the University of Reading.
- July 11, Prof. H. L. Hawkins: "Fossils and Men" (Presidential Address).
- July 13, Prof. E. B. Poulton: "The Power of Changing Colour as a Form of Protective Resemblance" (Public Lecture).
- INTERNATIONAL FEDERATION OF EUGENIC ORGANISATIONS, July 18-21.—Biennial Conference to be held at Zurich.
- Prof. Ernst Rüdin: "Racial Psychiatry—a Scheme for Topographical Research in Europe" (Presidential Address).

## Official Publications Received

## GREAT BRITAIN AND IRELAND

- Report of the Astronomer Royal to the Board of Visitors of the Royal Observatory, Greenwich, read at the Annual Visitation of the Royal Observatory, 1934 June 2. Pp. 22. (Greenwich.)
- Report for 1932 (No. 41) on the Lancashire Sea Fisheries Laboratory at the University of Liverpool. Edited by Dr. R. J. Daniel. Pp. 133+2 plates. (Liverpool: University Press of Liverpool; London: Hodder and Stoughton, Ltd.) 5s.
- Imperial Institute. Annual Report 1933, by the Director, Lieut.-General Sir William Furse, to the Board of Governors. Pp. 56. (London.) 2s.
- Committee on Bird Sanctuaries in Royal Parks (England). Report for 1933. Pp. 24. (London: H.M. Stationery Office.) 6d. net.

## OTHER COUNTRIES

- Mémoires du Musée Royal d'Histoire Naturelle de Belgique. Hors Série. Résultats scientifiques du voyage aux Indes orientales Néerlandaises de LL. AA. RR. le Prince et la Princesse Léopold de Belgique. Publiés par V. Van Straelen. Vol. 2, Fasc. 9: Paraperipatus Leopoldi nov. nom. By E. Leloup. Pp. 16+1 plate. Vol. 2, Fasc. 10: Trematodes. By Robert Ph. Dollfus. Pp. 16+2 plates. Vol. 3, Fasc. 8: Rhizocéphales. By H. Boschma. Pp. 8+1 plate. Vol. 3, Fasc. 9: Terrestrial Isopods. By H. Gordon Jackson. Pp. 8+2 plates. Vol. 3, Fasc. 10: Cirripedes (additional part). By Dr. C. A. Nilsson-Cantell. Pp. 8. Vol. 3, Fasc. 11: Ascidies. By H. Harant and Od. Tuzet. Pp. 6. Vol. 4, Fasc. 1: Heterometabola I. Pp. 85. Vol. 4, Fasc. 2: Neuroptera. Pp. 15. Vol. 4, Fasc. 8: Heterometabola III. Pp. 70+3 plates. Vol. 4, Fasc. 9: Coleoptera II. Pp. 57+1 plate. Vol. 5, Fasc. 2: Reptilia. By L.-D. Brongersma. Pp. 39+4 plates. (Bruxelles.)
- Suomen Geodeettisen Laitoksen Julkaisuja. No. 19: The Continental Undulations of the Geoid. By R. A. Hirvonen. Pp. 89. (Helsinki.)
- Reports of the Institute for Science of Labour. No. 19: Studies on the Hardness of Human Muscle, with special reference to its Value for measuring Industrial Fatigue. By Dr. Gitō Teruoka and Dr. Syōzō Eda. Pp. 9. 30 sen. No. 20: An improved "Rōken" Gas Analysis Apparatus. By Dr. Misawo Okuyama. Pp. 9+1 plate. 30 sen. No. 21: Labour Physiological Studies on the Pregnant Women. By Dr. Gitō Teruoka. Pp. 31. 60 sen. No. 22: Variations in the Physico-chemical Nature of Urine of Workers in Day and Night Shifts, by Dr. Takatugu Yagi and Miss F. Matubara; Physico-chemical Study on the Urine of the Working Girls in a Spinning Factory, by Sho Sasaki. Pp. 16. 30 sen. No. 23: Infant Mortality in relation to the Climate of Japan, Part I. By Dr. Tujiwo Iwasaki. Pp. 18. 40 sen. (Kurasiki.)

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