### The Kingston Valves for Steamships

AT a meeting of the Society of Arts on May 10, 1837, a Gold Isis Medal was awarded to Mr. Ross for an improvement in the adjustment of the object glasses of compound microscopes of high magnifying powers, and the large silver medal was awarded to Mr. Kingston of Woolwich Dockyard, for a safety blow-off pipe for the boilers of marine steam-engines.

When steam was applied to ships, it was necessary to cut holes through the skin of the ship for admitting water to the condensers and for the purpose of blowing-down the boilers. The early plan was to fit a cast-iron pipe through the wooden planking and place a valve or cock on the inboard side. If this valve or cock became defective, it was difficult to repair with the ship afloat. John Kingston, a foreman at Woolwich, therefore devised a form of conical valve with a long spindle of very simple construction, having the great advantage that the pressure of water outside the ship tended to keep it on its seating.

### Sir David Brewster on the Absorption of Light

ON May 11 and 25, 1837, a paper by Sir David Brewster was read to the Royal Society entitled "On the Connexion between the Phenomena of the Absorption of Light and the Colours of Thin-Plates". An abstract of the paper said: "The phenomena of the absorption of light by coloured media have been regarded by modern philosophers as inexplicable on the theory of the colours of thin plates, and therefore irreconcilable with the Newtonian hypothesis, that the colours of natural bodies are dependent on the same causes as the colour of thin plates. The discovery by Mr. Horner of a peculiar nacreous substance possessing remarkable optical properties, furnished him [Sir David] with the means of instituting a more accurate comparison between these two classes of phenomena. From the phenomena of thin plates, of polarized tints and of absorption, the existence of a new property of light is deduced, in virtue of which the reflecting force selects out of differently coloured rays of the same refrangibility, rays of a particular colour, allowing the others to pass into the transmitted ray, a principle not provided for in either of the theories of light to which the phenomena of absorption are ultimately referable."

### J. A. F. Ozanam (1773–1837)

JEAN ANTOINE FRANÇOIS OZANAM, the eminent medical historian and epidemiologist, who died on May 12, 1837, of tetanus following an accident, was born on July 9, 1773, at Chalamont near Bourg-en-Bresse, the son of a notary. After studying philosophy at Lyons in 1790–91, he passed six years in the French army and took part in the campaign in Italy, where he was present at the most important battles. In 1797 he obtained with some difficulty his discharge from the army, and after an unsuccessful venture in business, took up medicine on the suggestion and encouragement of the celebrated surgeon Marc Antoine Petit. In December 1810, at the comparatively late age of thirty-seven years, he qualified at Milan, where he devoted his attention to the sick and wounded French and Italian soldiers taken prisoners by the Austrians. In 1816 he left Milan for Lyons.

Ozanam's chief work was a history of epidemic, contagious and epizootic diseases in Europe from the earliest times and especially the fourteenth century down to his own day. The first edition was published at Lyons in five volumes in 1817–23, and the second in four volumes at Paris in 1835.

## Societies and Academies

### London

Royal Society, April 29.

H. H. POOLE and W. R. G. ATKINS: The penetration into the sea of light of various wave-lengths measured by emission or rectifier photo-electric cells. Further measurements of submarine daylight, using emission cells, gave for the vertical extinction coefficient 20 miles from land, $\mu_p = 0{\cdot}11$ for blue and 0·19 for near ultra-violet. The light travelling upwards was about two per cent of that going downwards. Measurements were made with Weston selenium rectifier cells, corrected for the curvature of the illumination current relation, using a modified form of the Campbell Freeth zero-resistance circuit. Infra-red is eliminated in less than 2 m. Red is reduced to 1 per cent at 10 m. The deeper water, 35–50 m., was clearer than that near the surface in the English Channel 10 miles from land. Near the shore the difference between red and green is lessened, but blue is relatively more heavily absorbed and differs more from green.

A. KEYS, B. H. C. MATTHEWS, W. H. FORBES, R. A. MCFARLAND and D. B. DILL: Individual variations in ability to acclimatize to high altitudes. The International High Altitude Expedition made observations at sea-level, 9,000, 12,000, 16,000 and 20,000 ft., of the physiological constitution of ten normal subjects. The capability of acclimatization of the members of the party was graded by a questionnaire as to the deviation in physical and mental performance from their sea-level values, of all members of the party. By this classification, the members of the party were arranged in order at each altitude. A number of physiological properties were observed at sea-level and at each station. No one of these yielded a good correlation with the classification referred to above, but the whole series taken together with suitable empirical coefficients yield a good correlation with the acclimatization classification.

G. A. MILLIKAN: Experiments on muscle hæmoglobin *in vivo*; the instantaneous measurement of muscle metabolism. A photo-electric arrangement is described by means of which the degree of oxygen saturation of the naturally occurring intracellular muscle hæmoglobin in a cat's soleus muscle may be measured instantaneously and recorded continuously. This instrument provides both a chemically specific and time-sensitive method of measuring muscle metabolism, and neither the nerve supply nor the blood supply need be disturbed. Muscle hæmoglobin acts as a short-time oxygen store, helping to tide the muscle over from one contraction to the next. When the muscle contracts, its oxygen demand rises to its maximum value in less than 0·2 sec. from the onset of contraction. There is good general agreement between both resting and active oxygen consumption as measured photo-electrically in the muscle fibre, and in metabolic experiments of the usual kind made on repetitively contracting mammalian skeletal muscle. Resting value: 0·07 mm.$^3$ $O_2$ per gm. per sec. During tetanic contraction: 1·0 - 3·5 mm.$^3$ $O_2$ per gm. per sec. Blood flow appears not to be greatly affected in the first few seconds of tetanic contraction. These results are in agreement with those of Rein and Kramer, and differ from those of Anrep.

## Paris

Academy of Sciences (*C.R.*, **204**, 1017–1048, March 31).

G. BERTRAND : Obituary notice of Amé Pictet.

GABRIEL BERTRAND and LAZARE SILBERSTEIN : New determinations of the amount of boron in plants cultivated on the same soil. The results confirm those previously published. The proportion of boron in the Leguminaceæ is higher than in the Gramineæ.

D. MANGERON : The periodic solutions of a certain class of partial differential equations of higher order.

JEAN DELSARTE : Certain series connected with Bessel's functions.

MME. CHRISTIANE PAUC : The geometrical study of a group of infinitesimal transformations.

GODOFREDO GARCIA and ALFRED ROSENBLATT : Regularization of the plane problem of three bodies.

JEAN CAPELLE : The generalization of the method of roulettes and the possible applications to the construction of skew gear.

SVETOPOLK PIVKO : The influence of the finite number of blades of supporting screws.

LÉVY HERMAN : The absorption of oxygen at the limit of the solar spectrum. Experiments leading to the conclusion that the absorption due to oxygen has no practical effect in limiting the solar spectrum.

JEAN PERREU : The solubility equation of hydrates.

MARC DE HEMPTINNE, JEAN SAVARD and PAUL CAPRON : The energy of dissociation of the molecule of carbon monoxide.

FÉLIX FRANÇOIS and MLLE. MARIE LOUISE DELWAULLE : The oxidation of nickel hydrate by sodium persulphate in alkaline solution.

RENÉ MORICARD and RENÉ BIZE : The development of the penis produced in the child by the injection of testosterone acetate.

GEORGES BLANC and M. BALTAZARD : The long preservation in the dry state of the virus of murin typhus in the excrement of infected fleas.

## Amsterdam

Royal Academy (*Proc.*, **40**, No. 3, March 1937).

F. K. T. VAN ITERSON : Separation of substances by flotation (2). Scientific principles underlying the practical application of the method.

W. H. KEESOM and A. BIJL : Determination of the vapour pressures of liquid nitrogen below one atmosphere and of solid β nitrogen. The boiling point of nitrogen is 77·35$_7$° K. and the triple point 63·15$_0$° K.

J. A. SCHOUTEN : Differential geometry of the groups of contact transformations (2).

F. M. JAEGER and L. BIJKERK : Investigations on the complex salts of the racemic and optically active cyclohexanediamines with trivalent cobalt and rhodium (3). Tri-cyclohexanediamine salts of trivalent cobalt. Crystallographic data and specific rotations.

E. MATHIAS, C. A. CROMMELIN and J. J. MEIHUIZEN : Density curve and the rectilinear diameter of krypton. The critical temperature is 209·39° K. and the critical density 0·9085.

C. S. MEYER : Products of Whittaker functions (2).

J. POPKEN : An arithmetical property of certain integral functions (2).

C. VISSER : Note on linear operators.

W. BEIJERINCK : Periodicity of flower formation in *Calluna vulgaris* (L.) Hull.

E. A. HANSON : Notes on some physical properties of chlorophyll films. Spreading of monomolecular layers of chlorophyll on water.

H. BAGGELAAR : Tertiary rocks from the Misool Archipelago (Dutch East Indies).

P. DE WIJKERSLOOTH : The metalliferous region of Moresnet-Bleyberg-Stolberg, Dutch Limburg.

H. G. BUNGENBERG DE JONG and G. G. P. SAUBERT : (1) Phosphatide auto-complex coacervates as ionic systems, and their relation to the protoplasmic membrane (ii). (2) Models for the stimulation of the organ of smell. Application of the results of the preceding communication.

S. BERGGREN : A direct connexion from the cortex of the cerebellum to the nucleus of Deiters.

## Brussels

Royal Academy (*Bull. Classe Sci.*, **22**, No. 12, 1936).

L. GODEAUX : A canonical surface belonging to the variety of Segre representing pairs of points of two planes.

F. H. VAN DEN DUNGEN : Remarks on the vocabularies of acoustics.

M. LERICHE : The Ypresian in the country lying between the Sambre and the Meuse.

P. V. PAQUET : The integral form $H_n$ in the invariant theory of the calculus of variations.

P. BURNIAT : Surfaces of genera one.

S. DE BACKER : Viscous fluids and waves which can be propagated. Evolution of a monatomic and polyatomic gas.

P. SWINGS and M. DÉSIRANT : Remarks on the formation of the nebulous emissive layers in *Be* stars.

P. BOURGEOIS and J. F. COX : Origin of comets.

R. DUGAS : The axiom of the initial conditions and 'legality' in quantum mechanics.

P. VAN RYSSELBERGHE : Application of affinity to coupled reactions.

L. MARTON : Electronic microscopy of biological objects (4).

J. P. BOSQUET : The definition of energetic quantities in acoustics.

M. FLORKIN : The rate of true plasmatic glycæmia in the decapod crustaceans.

T. DE DONDER and MISS Y. DUPONT : New theory of the dynamics of continuous systems (3).

W. H. BENEDICTUS : The generalization of the direct theorem of Jacobi.

## Moscow

Academy of Sciences (*C.R.*, **14**, No. 2, 1937).

A. D. ALEXANDROV : The problem of the existence of a convex body, in which the sum of radii of the main curvature is a given positive function satisfying the conditions of *Geschlossenheit*.

V. G. LIVENKO : Attempt at a general definition of the integral.

W. ROMBERG : A method for simultaneous approximate determination of specific value and specific function.

V. I. SMIRNOV : Solution of the problems of limits in the elasticity theory in the case of a circle and a sphere.

F. DUŠINSKIJ : The 'concentration extinction' of the fluorescence of dye solutions.

V. ČERNIAJEV and M. VUKS : Spectrum of the twilight sky.

B. A. PETRUŠEVSKIJ : Discovery of the Palæocene fauna in Tadzhikistan.

D. TRETIAKOV : Microreflectors in the skin of fishes.