

given during that period. The fifth year covers the more advanced side of aircraft and engine design, or alternatively advanced flying up to the standard required for a pilot's *B* licence. The teaching is carried out by the college engineering staff, with the addition of three special aeronautical instructors.

THE education of Negroes formed the subject of a national conference held in Washington under the auspices of the United States Federal Office of Education in May 1934. A preliminary report has now been published, as Bulletin No. 6 of 1935 of the Federal Office, under the title "Fundamentals in the Education of Negroes". The title, suggesting, as it does, differentiation between the principles of education applicable to Negroes and those applicable to whites, is rather misleading. The purpose of the conference was to determine what are the fundamental requirements for raising the standard, both quantitative and qualitative, of education of Negroes up to the level of the education of whites. One of the conclusions reached is that the southern States are not able to provide public education for all children on an equal basis with the other sections of the country, and another is that glaring inequalities exist in the expenditures of school funds for the benefit of Negroes and whites respectively. Eleven southern States spent, in 1930, 35½ dollars per pupil in all schools but only 12½ dollars per pupil in Negro schools; moreover, 64 per cent of the Negro schools were one-teacher schools. Associated, both as cause and as result, with the inadequate provision of schooling for Negro children, is the fact that more than half of all American Negroes live in the open country or in villages.

In "Science and the New Humanism", a series of articles contributed to the Workers' Educational Association's monthly, the *Highway*, Prof. L. Hogben, of the London School of Economics, outlines a field of study which he commends to the Adult Education Movement as one that offers an opportunity for work of the utmost national importance. The "Retreat from Reason", so ominously apparent among the younger generation in this as in other countries, he attributes to a dualism in educational politics, a cleavage between the education of scientific workers and technicians on one hand and of leaders and administrators on the other. This dualism, again, is a result of failure to adjust educational policies to the changes wrought in the structure of society by the enormous advances in the applied sciences. It is urgently necessary to devise methods of education which will give the community representatives who can co-operate intelligently with technical experts in constructive social enterprise at present suffering from paralysis as a result of educational dualism. In the first of his articles, Prof. Hogben exposes some of the faults of method that stultify current unscientific social 'science' doctrine. He quotes passages from the new humanistic studies making a fetish of mere logic, reducing their work to the level of a game of chess. Much, also, is sacrificed, he shows, to the idol of purity, so that a social inquiry which tends to the conclusion that something has to be done is said to be "tendencious", as if researches of a worker in natural science should be deemed worthless if there were grounds for suspecting the researcher of *wanting* to get a particular result, or an investigator is looked askance at for poaching on the preserves of investigators wearing a different subject label.

Science News a Century Ago

Lambeth Literary and Scientific Institution

ON April 12, 1836, a series of weekly lectures began at the Lambeth Literary and Scientific Institution, Wellington Terrace, Waterloo Bridge Road. The first and fourth of the lectures, by W. M. Higgins, were on electricity; in the second, third and sixth Dr. Lardner dealt with the principles and structure of the steam engine and its application to railroad and to navigation, while the fifth of the series was on the eye, the theory of vision and optical illusion, and was given by W. C. Dendy.

Petroleum and Titanium at Coalbrookdale

IN a paper on the physical features, geological structure and organic remains of the Coalbrookdale district, read to the Geological Society on April 13, 1836, Prestwich said that the petroleum or tar spring, for which Coalbrookdale has been so long celebrated, issues from a thick bed of sandstone, in the upper part of the coal measures: it yielded formerly more than a hogshead a day, but produces now only a few gallons a week. Another spring had been discovered, and petroleum is frequently found to some extent in working the coal. Titanium has been produced in considerable abundance in the iron furnaces. It often occurs in crystals of great beauty, but principally in amorphous masses. On examining some portions of hearth stones belonging to a furnace which had been at work for nine or ten years he discovered lumps of titanium as large as a marble cemented by a small quantity of iron.

Death of James Horsburgh

ON April 14, 1836, the eminent British seaman and hydrographer James Horsburgh died at the age of seventy-three years. Horsburgh was born at Elie in Fifeshire on September 23, 1762, of poor parentage. He learned elementary mathematics at school, and at fifteen years of age became an apprentice in a collier brig employed in the North Sea. In 1780 the vessel in which he was serving was captured by a French frigate, and Horsburgh was for a time a prisoner at Dunkirk. Regaining his liberty, he sailed for the East, and while first mate of an East Indiaman turned his attention to hydrography, teaching himself to draw and engrave. His voyages took him to China, Batavia and New Guinea, and some of his sailing directions and charts were published by the East India Company. Returning to England in 1796, his reputation gained for him the friendship of Banks, Maskelyne and Cavendish, but after a short stay at home he sailed again for the East, continuing his scientific observations. Back in England in 1806, he was admitted a fellow of the Royal Society, and in 1809 was appointed hydrographer to the East India Company in succession to Alexander Dalrymple. Few men contributed more to the safety of navigation in Eastern waters than Horsburgh.

On the Temperatures of Hot Springs

AT a meeting of the Royal Society held on April 14, 1836, Prof. J. D. Forbes concluded the reading of his paper "On the Temperatures and Geological Relations of Certain Hot Springs; particularly those of the Pyrenees; and on the Verification of Thermometers". He expressed his regret that notwithstanding the great interest of the subject, information on

the thermal phenomena was very deficient. After describing his own observations made in the Pyrenees in July and August 1835, in the last section of his paper he extended his inquiries to the hot springs met with in other parts of Europe; and in particular, those of the baths of Mont d'Or and of Bourboule, in France; of Baden-Baden, in Germany; of Loèche or Leuk, in the Vallais; of Pfeffers, in the canton of St. Gall, in Switzerland; and the baths of Nero, near Naples. Tables of observations were given with comparative columns derived from unpublished observations of Arago and Anglada.

Geology of Scotland

ACCORDING to the *Edinburgh Philosophical Journal*, at a meeting of the Wernerian Society held on April 16, 1836, "A notice was read on the dolomisation of the marble limestones, showing their magnesian character. The author also stated his views in regard to the geognostical relation of the Plutonian rocks of Skye, which he referred to the porphyry and trap formations. . . . The blunders in observation, and the wholesale appropriation to himself of the geology of Scotland (in despite of all the published and unpublished accounts of Scottish, English and German geologists) by Dr. MacCulloch, were noticed; and it was remarked by several members, that a better spirit was now generally abroad, and that few were disposed to follow in the path of the author of the *Hebrides*".

Societies and Academies

PARIS

Academy of Sciences, March 2 (*C.R.*, 202, 705-784). The president announced the deaths of Charles Nicolle and Ivan Pavlov. ERNEST ESCLANGON: The formulæ of Lorentz, and the principle of relativity. LUCIEN CUÉNOT: The coaptation of the anterior feet and of the head in *Phasma*. EDOUARD CHATTON and M^{lle}. SIMONE BRACHON: The cinetome of *Opalina ranarum*, its genetic continuity and its importance with regard to the evolution of the ciliary apparatus. JOS. KAUCKY: The problem of iterations in a case of dependent probabilities. EDGAR BATICLE: The problem of encounters. ALEXANDRE OSTROWSKI: The conservation of the angles in the conformal transformation of a domain in the neighbourhood of a boundary point. GEORGES HARTMANN: Certain properties of a Grassmanian. CHARLES CHARTIER and JEAN LABAT: The application of stereoscopic chronophotography to the kinematic study of gaseous outflow. HENRI LEMONDE: The interpretation of diffusion and viscosity curves in binary mixtures. PIERRE VERNOTTE: The general laws of natural convection. Conditions for the appearance of the first regime. D. MILOSSAVLÉVITCH: The use of the electronic tube as a detector utilising the curvature of the grid characteristic. ALEXANDRE DAUVILLIER: A photomagneton and its application to the measurement of twilight illuminations. P. CARRÉ: A practical rule leading to the interpretation of certain reactions of organic chemistry from the electronic point of view. L. NÉEL: The theory of volume anomalies of ferromagnetic substances. HENRI TRICHÉ: The spectrographic study of the modifications undergone by the surface of the light alloys. Application to duralumin. CONSTANT CORIN: The infra-red absorption spectra of the chlorine deriva-

tives of methane. JEAN ROULLEAU: The influence of temperature on the photo-electric effect of cuprous oxide-metal contact. The anomalies presented by the temperature coefficient of the photopotential are only apparent, and it is possible to define a temperature coefficient with constant contact resistance which depends only on the temperature and not on the cell studied. MAURICE CURIE: The theories of phosphorescence. The theory of Muto, based on the existence of a metastable state of the foreign atom, can be applied in the simplest cases, but other experimental facts have to be taken into account. RAYMOND LAUTÉ: The molecular volume of normal liquids. ALBERT MICHEL-LÉVY and HENRI MURAOUR: The influence of the pressure of the surrounding gas on the luminosities accompanying the detonation of explosives. Increase of pressure of the surrounding gas considerably diminishes the intensity of the luminous phenomena, when lead hydrazoate is the explosive. Three photographs are reproduced illustrating the effect of changing pressures. NÉDA MARINESCO: The law of blackening of photographic plates by ultra-sounds. The blackening by ultra-sounds follows a law analogous with that of Hurter and Driffield. The results show that the photo-chemical action of light and that of ultra-sounds are identical. MARCEL GODCHOT, M^{lle}. GERMAINE CAUQUIL and RAYMOND CALAS: The deuterhydrates of krypton and xenon. Forcrand showed that krypton and xenon can form hydrates with water containing approximately 6 H₂O. The hydrates formed with heavy water are found to have the same composition. PAUL BRASSEUR: The study of the anhydrous ferric phosphates with X-rays. Four varieties of ferric metaphosphate give the same X-ray diagram. Ferric pyrophosphate gave a different diagram, but no diagram characteristic of Millot's pyrophosphate could be obtained. PIERRE SÛE: The dehydration of some sodium niobates. EDOUARD RENCKER and MARC BASSIÈRE: The allotropic varieties of lead oxide. Lead oxide exists in two states (α and β) characterised by their Debye and Sherrer diagrams. The thermal transformation of the α -oxide into the β -oxide takes place suddenly at 530° C. MORICE LETORT: A new polymer of acetaldehyde. The polymer recently described by Travers was noticed by the author in 1933, while preparing some highly purified acetaldehyde. Its properties agree with those given by Travers. One reaction in addition is given; the polymer reacts violently with fuming nitric acid and some nitrobenzene is produced. MARTIN BATTEGAY and PIERRE BOEHLER: The salts of α - and β -anthracenyl-diazonium. PIERRE COMTE: The lower Devonian of Léon (Spain). ROBERT LAFFITTE: The Jurassic and Berriasian in Aurès (Algeria). ANDRÉ EICHORN and ROBERT FRANQUET: Chromosome enumeration and the study of somatic mitosis in *Asclepias cornuti*. SERGE TCHAKHOTINE: The effects of localised irradiation of the nucleus of Infusoria by ultra-violet micropuncture. ERNEST KAHANE and M^{lle}. JEANNE LÉVY: The diastatic hydrolysis of acetylcholine by serum.

AMSTERDAM

Royal Academy of Sciences (*Proc.*, 39, No. 2, February 1936). F. K. TH. VAN ITERSOM: Cavitation and surface tension. Studies to determine the cause of the erosion by cavitation of the pumps used in draining the Zuider Zee. W. H. KEESOM and P. H. VAN LAER: Relaxation phenomena in the transition