

Early Science at Oxford.

September 9, 1684. A letter from Mr. Creech, dated from Worcester, September the 4th, was read; it gave an account of a Woman in Worcester, who, for these twenty years last past, has every Sunday had a Convulsion Fit, and at no time else, unless she puts both her feet over her threshold; which if she does, a fit certainly seizes her; the case of this woman is drawn up by ye learned Dr. Cole, Physitian at Worcester, and was communicated to severall of the physitians in Oxford about a year and a half since.

Mr. Francis Davenport's account of the Tides at Tunquin and Mr. Halley's Theory of those Tides, were read, and will be printed very suddenly.

Dr. Plot communicated an Instrument made by Mr. Bard of Fretwell, for ye better æstimating ye increase, and decrease, of ye weight of oil of vitriol exposed to ye open air: ye Doctor promises us to make use of it, and give ye Society an account of ye success.

Dr. Plot also communicated an account of ye weather here at Oxon: during ye last month; and an abstract of a letter from the Reverend Dr. Thomas Smith, now at London, who says, that a Natural History of Scotland is lately printed at Edinborough by Sir Robert Sibbald.

The Doctor further communicated to the Society that, in a visit made by himself to ye men of Siam lately come into England, he received from them a present of a black lead pen of their country, and a nut whose kernell is call'd Areka, which has a smart aromattick tast, and is said to be purgative.

He understood from them, that their alphabet, and numerall figures, were ye same with those of ye Indians.

Dr. Smith shewing himself very ready to oblige ye Society, by proposing to those men of Siam any quæries which shall be sent him hence, it was offered by Mr. Bernard, that ye Doctor be desired to discourse with them on ye severall heads of Dr. Plot's sheet of enquiries.

There being some discourse concerning Barometers, particularly it being affirmed, That a candle placed near ye upper and empty part of ye Tube will make ye quicksilver descend; it was proposed by Mr. Bernard, that tryall be made, whither spirit of harts-horn, applied to the top of ye Tube, will cause ye quicksilver to ascend?

Mr. President proposed that enquiry be made whether the quicksilver arises and falls in old barometers, to as many degrees, as it did in ye same barometers, when they were new? In one, which he for many years made use of, he has found it does not.

Dr. Plot presented ye Society with a peice of heavy wood from Jamaica, called *Kicongo*; 'tis of a smell like *Enula Campana*. Some Experiments will be tried on it very suddenly; and an account of them brought in to the Society.

The Doctor, having finished his discourse *de Origine Fontium*, was, at this meeting, desired by ye Society, to communicate it to them, and begin reading it the next week.

The Society then tooke into consideration the enlarging of their Correspondence; for ye effecting of which, they concluded, that some attempts be made for ye settling a Correspondence in Scotland, in like manner, as it is now carried on between ye Royall Society, and that of Dublin, and this of Oxford; in order whereunto, it was ye most humble request of this Society to Mr. President to take on him ye trouble of writing to the Heads of ye Universtys in Scotland, concerning this affair.

Societies and Academies.

LONDON.

Institute of Metals (Autumn Meeting, Glasgow), September 2.—J. H. Andrew and Robert Hay: Colloidal separations in alloys. The β constituent may break down into colloidal α and colloidal γ , and upon submitting these to an electrical current, the colloid is destroyed and the crystalline phase begins to make its appearance. The ageing of duralumin may be due to the deposition of the magnesium compound in the colloidal form, when the increase in hardness would be due rather to the fineness of state of division of the separating phase than to its specific properties.—John S. Brown: The influence of the time factor on tensile tests conducted at elevated temperatures. With non-ferrous alloys there is a critical temperature condition, above which the rate of application of the load has an important influence on the observed strength. This time factor tends to lose its effect when the rate of loading is kept below 1 ton per sq. in. per day, and this value is consequently put forward as of basic importance in such investigations.

—R. B. Deeley: Zinc-cadmium alloys. A note on their shear strengths as solders. A substitute for brazing spelter was required for the motor-cycle industry. The working temperature of the substitute solder had to be below that likely to promote coarse crystallisation of the hard-drawn steel tubing of the frame, and the melting point had to be sufficiently above the enamel stoving temperature (about 180° C.) for joints made with the alloy not to fail during enamelling. Zinc-cadmium alloys in pure shear show the strongest alloy to be near the eutectic composition. This alloy is considerably stronger than tinman's solder, 8 tons/sq. in. compared with 4 tons/sq. in.—

J. W. Donaldson: Thermal conductivities of industrial non-ferrous alloys. The thermal conductivities of 70:30 brass, high tensile brass or manganese bronze, Admiralty gunmetal, ordinary gunmetal, bearing phosphor bronze, white bearing metal, and monel metal are low, ranging from 0.067 for monel metal to 0.242 for 70:30 brass. Increasing the temperature increases the conductivities. The alloys of tin and copper have a lower conductivity than those of zinc and copper, while nickel lowers considerably the conductivity of an alloy containing it.—Marie L. V. Gayler: On the constitution of zinc-copper alloys containing 45 to 65 per cent. of copper. In an equilibrium diagram, no change in microstructure of alloys consisting wholly of the β constituent could be detected.

—J. L. Haughton and W. T. Griffiths: The β transformations in copper-zinc alloys. The change of resistivity with temperature was determined for some alloys containing from 46 to 63 per cent. copper. Above 55 per cent. copper the β -transformation temperature is 453° C.; between 55 per cent. and 51 per cent. copper it takes place at temperatures rising from 453° C. to 470° C.; with less than 51 per cent. copper the transformation temperature is 470° C. These data are opposed to the theory that this is a eutectoid transformation. The specific resistances at room temperatures were also measured after annealing just above the transformation point. The resistance falls rapidly as the copper decreases from 61 per cent. to 53.5 per cent., and less rapidly to about the 50 per cent. copper alloy; it rises steeply from this point with further decrease of copper content. Thus the two boundaries of the field at room temperature occur at 50.0 and 53.5 per cent. of copper.—C. H. M. Jenkins: The physical properties of the copper-cadmium alloys rich in cadmium. Alloys containing up to 5 per cent. of copper in the

cast, rolled and annealed states, were used. The effect of even a small addition of copper to cadmium is to cause the formation of a second constituent CuCd_3 ; this increases the tensile strength and Brinell hardness and prevents the grain growth of cadmium on annealing. Additions of more than 3 per cent. of copper do not materially improve the mechanical properties of cadmium owing to the presence of too large a proportion of the brittle compound.

PARIS.

Academy of Sciences, July 20.—A. Haller and R. Cornubert: The constitution of the dimethylcyclopentanone and the dimethylcyclohexanone obtained by alkylation by means of the sodium amide method.—Nicolas Kryloff: A method based on the principle of the minimum, for the approximate integration of differential equations.—R. A. Fisher: The solution of the integral equation of V. Romanovsky.—W. Stepanoff: Some generalisations of nearly periodic functions.—Rolf Nevanlinna: A theorem of unicity relative to uniform functions in the neighbourhood of an essential singular point.—N. Lusin: The use of the diagonal of Cantor.—R. Roudaire-Miégevillé: A new grapho-mechanical determination of systems of real or imaginary solutions of algebraical equations.—J. Seigle: Tests of mild steel by combined stresses.—Marcel Peschard: The magnetisation of ferro-nickels (paramagnetic properties).—G. Athanasiu: The sensibility of actinometers with electrodes coated with silver iodide and copper oxide.—G. Bruhat and M. Pauthenier: A theoretical study of $320 \text{ m}\mu$ of carbon disulphide.—R. de Malleman: The calculation of rotatory power starting with the molecular structure.—S. Pina de Rubies: The arc spectrum of scandium. The scandia was extracted by G. and P. Urbain from Madagascan thortveitite, transformed into the acetyl-acetonate and the latter purified by repeated sublimations in a vacuum at 190°C ., followed by recrystallisation from absolute alcohol. A table of wave-lengths and intensities is given.—Gabriel A. Rousseau: Method for instantaneous photography in colour. Three films are superposed: the first receives a slow ordinary emulsion, the second an emulsion sensitive to the yellow and green, and the third an emulsion sensitive to the yellow and red. Details of the preparation of the sensitised films are given. The photograph is taken without a screen, working as with an ordinary plate.—Adolphe Lepape: The radioactivity of some cold springs in the Bagnères-de-Luchon region and on its origin.—Mlle. Germaine Cauquil: Study on viscosity and surface tension during esterification.—Pariselle and Laude: The magnesia carried down by alumina in ammoniacal media. The presence of a large excess of ammonium chloride prevents co-precipitation of magnesia with aluminium hydroxide.—Pierre Bedos: A new racemic menthone and the two corresponding stereoisomeric menthols.—R. Locquin and R. Heilmann: The decomposition of the pyrazolines by spontaneous oxidation. The spontaneous oxidation of pyrazolines by air is complex and gives either a saturated or an unsaturated ketone, together with basic substances of high boiling point, so far not identified.—E. E. Blaise and Mlle. M. Montagne: The transformation of the dialkylcyclohexenones into dialkylbenzenes. Methyl-ethylcyclohexenone heated in a sealed tube on the water bath with a saturated aqueous solution of hydrobromic acid gives *o*-methyl-ethylbenzene. The reaction appears to be of a new type.—I. Pouget and D. Chouchak: The radioactive mineral waters of Guergour, Algeria.—Mlle. H. Popovici: The formation of essential oils.—Raoul Combes: Does light exert a direct action on the decomposition of chlorophyll in

leaves in the autumn? The results of the experiments described are not in agreement with Wiesner's hypothesis, and light does not appear to be a direct cause of the disappearance of chlorophyll from leaves in the autumn.—André Mayer and L. Plantefol: The equilibrium of the cellular constituents and form of oxidations of the cell. Imbibition and respiratory types in reviviscent plants.—H. Colin and A. Grand-sire: The mineralisation of green leaves and of chlorotic leaves.—P. R. Bohn: The presence of crystals of calcium oxalate at the surface of certain Caryophyllaceæ.—Kuhner: The development of *Lentinus tigrinus*.—Emile Saillard: The method of Clerget. Coefficients of inversion. Inversion at the ordinary temperature for 28 hours, or at 70°C . (11 minutes) gave the same results. The inversion coefficient varies slightly with the concentration of the saccharose; figures are given for coefficients of solutions from 4 to 16 per cent. of saccharose.—Ch. Brioux and J. Pien: The use of the quinhydrone electrode for the determination of the P_n of soils. This method is advantageous from the point of view of rapidity and simplicity, but there are divergences between the results obtained by the quinhydrone and hydrogen electrodes at present unexplained.—M. and Mme. A. Chauchard: The law of excitability of the electrical apparatus of *Torpedo marmorata*.—A. Rochon-Duvigneaud, E. Bourdelle, and J. Dubar: An attempt at the determination of the anatomical binocular visual field of the horse.—F. Viès and A. de Coulon: Relations between the experimental displacement of the muscular isoelectric points and the evolution of grafted tumours.—L. Hugouneq and J. Loiseleur: The superposition of the phenomena of dissociation and elective adsorption in the proteolytic diastases.—E. Kayser and H. Delaval: Radioactivity, nitrogen fixers and alcoholic yeasts. In an earlier communication it was proved that the addition of a radioactive mineral to the ordinary nutritive medium stimulated the action of *Azobacter*, and the increase varied with the strain of the organism. These results are now supplemented by varying the proportion of the radioactive mineral, by ascertaining the influence of repeated use, and by determining the ratios between sugar used up and nitrogen combined. The effect of the radioactive mineral on alcoholic fermentation has also been studied.—Jean Bathellier: The period of the determination of the castes in *Eutermes matangensis*.—Ch. Champy: The disharmony of the secondary sexual characters and the proportionality of the sexual glands in insects.—G. Ramon: The production of antitoxins.—F. Diéner: Contribution to the study of activated sludge.—Georges Bourguignon: The physio-pathological signification of Babinski's test.—C. Levaditi, A. Girard, and S. Nicolau: The treponemical action of gold and platinum.—Georges Truffaut and N. Bessonoff: The predominance of the activity of anaerobic nitrogen fixers in the soil.

CALCUTTA.

Asiatic Society of Bengal, August 3.—H. L. Chhibber: Microscopic study of the old copper slags at Amba Mata and Kumbaria, Danta State, N. Gujarat, India. The sites are two old metallurgical centres more than six hundred years old. The slags are mostly the remains of low grade minerals of the oxidised zone; no great depth below the surface was worked.—N. G. Mazumdar: Dacca image inscription of the reign of Lakshmanasena. Iconographically this is an important image, as representing an otherwise unknown type of Chandī.—B. S. Guha: Preliminary report on the anthropometry of the Khasis. Measurements were made of inhabitants of Cherapunji and neighbouring villages. Special attention was given to the measurements of

the face; there is difficulty in determining the shade of colour of the skin of brown people.—Hem Chandra Das-Gupta: Palaeontological notes on the Panchet beds at Deoli, near Asansol. Descriptions of three specimens: (1) the carapace of a brachyurous crab (?); (2) a stegocephalian cranium; (3) a reptilian coracoid. The second specimen is tentatively identified as belonging to *Pachygonia incurvata*, Huxley; the third specimen, similarly, to *Epicampodon (Ankistrodon) indicum*, Huxley. The first specimen differs from the only two described genera of Triassic brachyurous crabs.—Sukumar Sen: Notes on the employ of the cases in the Kāthaka-samhitā. An analysis of the use of the cases as exhibited in Leopold von Schroeder's edition, published from 1900 to 1910, shows a marked difference in language and idiom as compared with other Vedic prose texts.

MELBOURNE.

Royal Society of Victoria, July 16.—Gerald F. Hill: Termites from the Ellice Group. The only species of termite hitherto recorded from these islands has been confused with an American species until recently supposed to have been introduced into Hawaii. The species is identical, however, with an imperfectly known Samoan insect—*Calotermes samoanus* Holmgr.—and not with any described Hawaiian or American form. *Prorhinotermes inopinatus* Silv., hitherto known only from Samoa, is now recorded from the Ellice Group. Both species are destructive to coconut palms.—C. E. Eddy: The *L* absorption limits of lutecium, ytterbium, erbium, and terbium. The *L* series critical absorption wave-lengths were measured relative to tungsten *L* lines as standards. A metal X-ray tube, with a thin window, and capable of being operated at 30 kilovolts and 30 milliamperes, was constructed, and used in conjunction with a low pressure spectrometer. The values of the critical absorption wave-lengths were as follows:

	L_T	L_{II}	L_{III}
Lutecium . . .	1136.21 X.U.	1194.0 X.U.	1337.5 X.U.
Ytterbium . . .	1176.4	1238.14	1382.64
Erbium	1265.5	1335.60	1479.19
Terbium	1417.0	1499.4	1644.2

—W. J. Harris: Victorian graptolites (new series), Pt. 2. Four graptolites are described, three being new species, and one of these representative of a new family. Atopograptidae (*fam. nov.*)—a biserial form with theca with extroverted apertures; represented by *A. woodwardi*, *nov.*, from Bendigo East. *Didymograptus nodosus*, *sp. nov.*, and *Cardiograptus crawfordi*, *sp. nov.*, from Bendigo East and Gisborne (Victoria). These three species are from Upper Darriwil beds, near the top of the Lower Ordovician.—W. M. Bale: Further notes on Australian hydroids, V. This paper describes *Sertularia nana* and *S. gracillima* new species, and gives a detailed account of *S. furcata* Trask, a common Californian species recorded doubtfully as Australian. A *Sertularia*, originally referred to *S. polyzonias*, is now described as *S. peregrina n. sp.* It is most nearly related to *S. mediterranea* Hartlaub. *Plumularia delicatula* Bale is given a new name—*P. Wilsoni*—on account of the priority of *P. delicatula* Busk (an *Aglaophenia*). A variety of *Aglaophenia divaricata* Busk, formerly referred doubtfully to *A. acanthocarpa* Allman, is named var. *Briggsi*.—Irene Crosin: The geology of Green Gully, Keilor, with special reference to the fossiliferous deposits. Green Gully is near the Keilor township, ten miles from Melbourne. The rocks consist of a succession

of Cainozoic sediments overlying the older basalt which rests on the Silurian bed-rock. The lowest of these Cainozoic sediments is a moderately deep-water limestone which passes into a fossiliferous ferruginous rock, both of which are of Miocene (Janjukian) age. The limestone is characterised by a rich growth of calcareous alga (*Lithothamnium*) and by the abundance of the discoidal tests of several species of *Lepidocyclina*. The ferruginous bed contains a large assemblage of molluscan fossils, mainly in the form of casts, as well as some corals, which show close relationship with the Janjukian fauna of Table Cape, Tasmania, some species being restricted to the two localities.—Frederick Chapman: Geological notes on Neumerella and the section from Bairnsdale to Orbost. Fossils are of Miocene (Janjukian) age and were collected at Neumerella during the construction of the Bairnsdale to Orbost line. 150 species of fossils are recorded and notable additions made to the lists of fossil fishes, ostracoda, mollusca, polyzoa, and foraminifera. The fossil bands are seen in the cuttings, with remains of cetaceans and sharks' teeth; there are intercalated marly limestone layers, and evidence of local crumpling and faulting in the Janjukian. Large volutes and *Nautilus* frequently occur in the yellow marls as casts, and many are encrusted with a crystalline coating of calcite, probably representing the dissolved shell.

ROME.

Royal Academy of the Lincei, June 21.—B. Grassi: Contribution to the study of the biology of *Anopheles superpictus*.—B. Longo and A. Cesaris-Demel: The possibility of anaphylactic sensitisation in vegetable organisms.—S. Saks: Integration of the polynomials of Stieltjes.—Bruno Finzi: The motion of the boomerang.—Luigi Carnera: The new Washington catalogue of fundamental stars and the Berlin catalogue of circumpolar stars.—D. Pacini: Observations on the vertical air-earth current.—E. Fermi and F. Rasetti: Effect of an alternating magnetic field on the polarisation of resonance light.—E. Persico: Amplitude of the oscillations produced by a three-electrode lamp.—L. de Caro: Surface tensions of gelatin solutions of different hydrogen-ion concentrations.—E. Clerici: The diffusion of certain microscopic organisms of the rocks accompanying the Roman volcanic tufas.—Silvio Ranzi: The organ of sense derived from the first epibranchial placoid of Selacei.

Diary of Societies.

WEDNESDAY, THURSDAY, FRIDAY, SEPTEMBER 9, 10, 11.

IRON AND STEEL INSTITUTE (Birmingham Meeting) (at the University, Edmund Street, Birmingham).—J. H. Andrew and R. Higgins: The Dilatation of Cast Irons during Repeated Heating and Cooling.—M. L. Becker: Equilibrium at High Temperatures in the Iron-Carbon-Silicon System.—D. F. Campbell: High Frequency Induction Furnaces.—E. P. Campbell and J. F. Ross: The Chromium-Iron Equilibrium in Carbides recovered from Annealed 2.23 per cent. Chrome Steels.—A. L. Curtis: Steel Moulding Sands and their Behaviour under High Temperatures.—Prof. C. A. Edwards and L. B. Pfeil: The Tensile Properties of Single Iron Crystals and the Influence of Crystal Size upon the Tensile Properties of Iron.—Dr. C. F. Elam: The Orientation of Crystals produced by heating Strained Iron.—Dr. J. Newton Friend and W. E. Thorneycroft: Ancient Iron from Richborough and Folkestone.—R. H. Greaves and J. A. Jones: The Effect of Temperature on the Behaviour of Iron and Steel in the Notched Bar Impact Test.—L. Grenet: Notes on the Iron-Nickel and Iron-Cobalt Equilibrium Diagrams.—H. Kamura: Reduction of Iron Ores by Hydrogen.—J. L. Keenan: Blast Furnace Practice in India, with special reference to Economy in Coke Consumption.—W. R. Martin: The Davis Steel Wheel and its Manufacture in England.—J. A. Mathews: Retained Austenite.—H. Fiodin: A New Direct Process.—J. H. Partridge: The Magnetic and Electrical Properties of Cast Iron.—A. Sauveur and V. N. Krivobok: Dendritic Segregation in Iron-Carbon Alloys.—A. Sauveur and D. C. Lee: The Influence of Strain and of Heat on the Hardness of Iron and Steel.