## Early Science at Oxford.

**June 22, 1686.** The Minutes of the Dublin Society from Apr. 26, to May 17th were read: Also a discourse of Mr. Caswels, Shewing how the *Shadow* may *goe back* on an Horizontal plane in any latitude, if the stile point betwixt the Tropics; also on any other plane unlesse the situation thereof keeps the Sun from shining long enough thereon; together with the calculation of the time and quantity of the shadow's regression, according to the various situations, of the stile and plane.

Mr. Lloyd haveing observed that many curious Travellers when they visit the Repository, doe occasionally relate some remarques of their own experience, concerning things of *Nature* and *Antiquity*; he thought it might prove of some consequence to provide a Book that should lye in the Repository; wherein he might breifly set down, the contents of such relations; desireing each Gentleman to subscribe to what he communicated.

'Twas ordered that such relations should be transcribed into the Minute Book in ye method indicated by two examples written out in full by Mr. Lloyd.

**June 23, 1685.** Dr. Plot presented severall Birds, as ye Puffin, Razor Bill, and ye Eligug, together with ye Egges of each Species; the Egges were observed to be large, but especially those of ye Puffin.

He communicated an account of incombustible cloth, drawn up by way of letter to Mr. Bayly, Fellow of ye Royal Society, and Mr. Wait, both Merchants of London; this discourse was read.

**June 24, 1684.** A Letter from Mr. Aston, dated June ye 21st 1684 was read; which mentioning an experiment lately made before ye Royall Society, for finding ye quantity of air, contained in Iron; it was ordered, that Mr. Aston be desired to communicate ye manner, and method, of that Experiment. In this letter were contain'd ye Minutes of ye Dublin Society, from Aprill ye 28th to June ye 2d:, which mentioning that a Dog, haveing about 2 inches in depth, and 3 or 4, in bredth, cut off from one of ye lobes of his lungs, recovered it without any injury to him, Mr. Musgrave assured ye Society, that ye same Experiment was tried by Dr. Lower, here in Oxon, many years since, with ye same success, as he heard from Mr. Fry, formerly a Chyrurgion in this Town, who assisted ye Doctor in that Experiment.

These Minutes giving also an account that one of ye externall jugulars of a Dog, was tied without injuring ye Dog. Mr. Musgrave read a paper, acquainting ye Society with what he did in this kind ye last March: the paper is as follows: Sometime in March last, I tied ye 2 externall jugulars of a dog, and cut off ye veins, on this side of ye Ligatures, towards ye heart: The same experiment was tried many years since, by ye famous Dr. Lower (see his book *de corde*, pag: 112, ed. Amstel: 1671).

These were ye strange effects of ye Doctor's experiment, and my success, in repeating it, was also somewhat surprising, but on a different account; for I could never find, that ye dog, on which I tryed this experiment, was any way concerned, otherwise than at ye wound; I found no alteration in him at all, that I could impute to ye stoppage of ye circulation, in ye veins before mentioned &c.

About 3 weeks after this experiment, ye wounds being now heald, I tried another Experiment on ye same dog, under which he died: I examin'd him as to ye jugulars, which I found almost dried up:

This experiment was tried in ye presence of Mr. Paige, and some others, of New College.

Ordered, ye Eclipse of ye Sun on 2 July next, to be strictly observed.

## Societies and Academies.

LONDON.

**Royal Society,** June 11.—R. **Magnus**: Animal posture (Croonian Lecture). Postural centres in brain-stem compound the body musculature to combined action. Postural stimuli arise from many different sense organs. Change in position of one part of the body is followed by postural (usually harmonious) changes in other parts. Postures are adapted to environment by combined action of distance receptors and attitudinal reflexes. The righting function, absent in decerebrate, is present in midbrain animals. Righting reflexes evoked from labyrinths, exteroceptors, and proprioceptors, bring head and body into normal position. Optical righting reflexes are present in higher mammals only. Paralysis of one righting apparatus is usually compensated by other righting reflexes. Centres for righting are arranged subcortically. The resting position of the eyes changes with different positions of head, and is controlled by postural reflexes. In animals with lateral eyes (rabbits) the visual world remains fixed in spite of head movements. This is accomplished by the combined action of otolithic and neck reflexes. Motor reflexes from the semicircular canals initiate these static reactions of the eyes. Centres for all these reflexes are arranged in three groups. The red nucleus is the centre for two of the righting reflexes. Labyrinthine reactions have greater importance in lower mammals. Postural function of other parts of brain is largely unknown.

**Royal Anthropological Institute,** May 5.—V. **Gordon-Childe**: The lake dwellings in Europe in the light of the new excavations. Prior to 1920 our conception of the development of civilisation among the inhabitants of the pile villages of the Alps was perforce based on *a priori* typological analysis of the heterogeneous material dredged up haphazard. These conceptions were largely erroneous. On Lake Neuchâtel, Dr. Vouga has found at several sites no less than four superimposed settlements. The oldest villagers used jadeite more freely and made much finer pottery than their successors. They possessed all the domestic animals and depended less on food-gathering than the later settlers; on the other hand, they may have been cannibals. In Wurtemburg the studies of Runerth of Tübingen have rendered possible the reconstruction of several types of neolithic houses and revealed pottery some of which is related to both the earliest fabrics of Lake Neuchâtel and those in use in the Danube Valley in the second neolithic period there. Beside the well-known Bronze Age village on Laibach Moor, an earlier settlement has been identified which, despite a "neolithic" inventory, probably belonged to the dawn of the age of metal as whetstones were found. On Lake Alvastra in Sweden a pile dwelling of the stone age was excavated in 1911. Its occupants had practised agriculture and possessed artefacts similar to those of the megalith builders on the coasts, but their pottery and celts were of types proper to the food-gathering population of the "dwelling-places." The "neolithic" elements from the Swedish and Swiss lake dwellings are fundamentally different. It is therefore impossible to attribute both the pile-dwelling habit and the neolithic civilisation to the "brachycephalic invaders" assumed by classical theory. Incidentally the more easterly and southerly lake-dwellings at Laibach and in Bosnia are later than the western and northern. On the other hand, a race of hunters and fishers had inhabited rafts in the early neolithic (dolmen) period in Scandinavia and even earlier in the mesolithic period in Denmark and

Yorkshire. At the same time much of the industry revealed in lake dwellings south of the Alps and Scandinavia may be derived from the mesolithic—horn harpoons and sleeves, wooden boomerangs, phalange whistles, etc. It is therefore suggested that the lake dwellers are descendants of the mesolithic food-gatherers, that the lake dwellings are improvements on the mesolithic raft—an intermediate phase being illustrated by the platform structures of Denmark and West Switzerland—but that the neolithic arts were borrowed from more advanced peoples; the Danubians in the Alps, the megalith builders in Scandinavia.

**Geological Society**, May 6.—E. B. **Bailey**: The Tertiary igneous geology of the Island of Mull. In Judd's region of central pneumatolysis (propylitisation), within an area measuring 15 miles in diameter, it is impossible to find a lava that has retained its olivine undecomposed. Referring to Judd's conception of central subsidence, it now appears, from the disposition of lava-types and other considerations, that central subsidence culminates in two adjacent calderas. The occurrence of many pillow-lavas within one of these calderas—at the centre of a manifestly terrestrial volcano—points to the frequent presence of a crater-lake. The crater-hollow must have been renewed by intermittent subsidence. Ring-dykes are numerous. There is conspicuous folding attributable to the lateral expansion of an early ring-dyke. Similar folding does not recur in connexion with later ring-dykes. Several ring-dykes in Mull show gravitational differentiation, which took place during crystallisation.

**Physical Society**, May 8.—E. **Hughes**: A magnetic bridge for testing straight specimens and an analysis of the hysteresis loop of cobalt-chrome steel. The author employs a permeameter resembling that of Iliovici, in which the currents in two coils providing the M.M.F. of a magnetic circuit containing the specimen are adjusted until no magnetic potential difference exists between a selected pair of fixed points on the specimen. In the present apparatus the required absence of magnetic potential difference is tested by bringing up a yoke until its ends abut upon the two points in question: the approach of the yoke should excite no current in a search coil wound on the specimen and connected in a low-resistance galvanometer circuit. Resistance is then added to the galvanometer, and the deflexion caused by a reversal of the two magnetising currents enables the permeability to be calculated. To form a permanent magnet the energy of which per c.c. is within 5 per cent. of the maximum obtainable, a magnetising force of upwards of 1000 C.G.S. units must be applied.—M. C. **Johnson**: The experimental control of electrically broadened spectral lines. Concentration of ions is the obvious controlling factor if the Stark hypothesis be adopted; recombination of ions on this hypothesis may explain the capacity and inductance curves obtained in these experiments, between 0·3 and 1·0 Å.U. This view is further tested by controlling the broadening without altering the current in the tube or the period of the discharge. The several effects involved are accounted for on the theory that line width depends on the number of charges which surround an emitting particle.—K. Rangadhama **Rao**: The spectra of the metals of the aluminium sub-group. Continuing the previous work on absorption of light by thallium vapour, the author has now studied the absorption of thallium vapour from λ2400 to λ2000, and that of indium from λ6000 to λ2000. The absorption tube was of steel, and provided with quartz windows at the ends, and absorption was studied with a quartz spectrograph. The absorption spectra indicate marked similarities. None of the lines of the principal series appeared in absorption, even at the highest temperatures used. One remarkable feature is the very marked absorption of the members of $1\pi_2$—$m\delta'$.

## CAMBRIDGE.

**Philosophical Society**, May 4.—R. H. **Fowler**: A theoretical study of the stopping power of hydrogen atoms for α-particles. The problem of the stopping power of light atoms for α-particles has been reopened by Bohr, in a way which will allow of the retention of a purely mechanical calculation of the effect on the α-particle in spite of the quantum restrictions on the reactions on the atoms. This mechanical calculation of the energy lost by the α-particle is carried out, taking into account the actual orbits of the electrons, instead of assuming elastically bound electrons. Circular orbits in a Coulomb field are dealt with by the method of perturbations. These must be carried to the second order for the energy, as the mean value of the first order transfer of energy is zero. The result is the same in form as Bohr's former result, but gives a slightly greater numerical value to the stopping power, which is about 10 per cent. larger as here calculated than the measured stopping powers for He and $H_2$.—K. G. **Emeléus**: The action of the electrical counter. With the point positive an effect can be expected proportional to the initial ionisation due to the particle being recorded, whilst when it is negative a much larger discharge should be obtained which is almost independent of the initial ionisation. Extinction of the discharge at atmospheric pressure is brought about by a local increase of pressure near the tip of the point, probably accompanied by an electric wind along the side of the needle.—F. H. **Constable**: An apparatus for the investigation of the effect of poisonous substances, and mixed vapours on catalytic activity. Vapour mixtures of known composition can be supplied at a constant rate to the catalyst, which is maintained at a definite temperature. The general theory of "Centres of Activity" has been applied to selective poisoning. The decay of the reaction velocity occurs according to a logarithmic law, and the temperature coefficient is unchanged by moderate poisoning in cases in which a small fraction of the surface is catalytically active. Neither poisoning nor sintering alters the temperature coefficient of a chemical reaction, and the activity of a poisoned catalyst falls in accord with a simple logarithmic law.—R. A. **Fisher**: Theory of statistical estimation.—W. **Burnside**: (1) On the idea of frequency. (2) On the representation of the modular group of order $\frac{1}{2}p(p^2-1)$ as a group of linear substitutions on $\frac{1}{2}(p-1)$ symbols, when $p$ is a prime of the form $4n+3$.—J. P. **Gabbatt**: On pedal quadrics in non-euclidean hyperspace.—F. P. **White**: An extension of Wallace's, Miquel's, and Clifford's theorems on circles.—H. F. **Baker**: (1) The stability of rotating masses of liquid. (2) Note on a formula for Lamé functions.—M. J. M. **Hill**: (1) On the substitution of Wallis's postulate of similarity for Euclid's postulate of parallels. (2) On the hypothesis of the obtuse angle.—J. D. **Cockcroft**: The temperature distribution in a transformer in which heat is generated at a uniform rate. The continued increase in the size of transformers has made a more exact knowledge of the temperature distribution in the laminated cores necessary. The temperature distribution in an infinite rectangular laminated core is found and the solution applied to an oil-cooled transformer core.—C. G. F. **James**: Some formulæ for scrolls and line systems in higher space.

DUBLIN.

**Royal Dublin Society**, May 26.—Report of the Irish Radium Committee for the year 1924. The report shows that 12,885 millicuries of emanation were issued for therapeutic purposes during the year. A temporary laboratory has been fitted up at Ballsbridge for carrying on the work of the Radium Institute. Reports from some of the largest medical users of emanation in Ireland are included. These contain numerous records of successful results obtained with radium treatment.—F. E. **Hackett**: The Zeleny electroscope and its uses as a lecture demonstration instrument.

PARIS.

**Academy of Sciences**, May 18.—F. E. **Fournier**: General properties of the simple satellite wave produced by the translation of hulls of forms favourable to high speeds.—Maurice **Hamy**: Cutting optical surfaces with elliptical or hyperbolic sections.—H. **Deslandres**: Complementary researches on the structure and distribution of band spectra. New measurements of absorption bands in the infra-red of oxygen, carbon monoxide, hydrocyanic acid, ammonia, water vapour and methane. For these six gases the absorption bands may be represented by the formula $K = q\frac{1062 \cdot 5}{r.s}$, where $q$ is an integer, $r$ is an integer, and $s$ a third integer equal to the number of atoms in the molecule.—Marin **Molliard**: The action of high temperatures, compatible with life, on the development of cells: Studies in the mode of development of *Sterignatocystis nigra* at temperatures ranging between 36° C. and 44° C.—L. **Lindet**: The coagulation of casein in the presence of calcium salts in acid solution.—C. **Sauvageau**: The culture of the alga *Strepsithalia Liagorae*.—V. **Romanowsky**: The generalisation of an inequality of A. Markoff.—J. **Le Roux**: The variation of mass.—Raymond **Chevallier**: Ferromagnetic ferric oxide. Starting with a commercial finely powdered black oxide of iron, this is oxidised by air at a temperature of 350° C. It then has the composition of ordinary ferric oxide but is of a yellowish colour and is strongly magnetic. This ferromagnetism is lost on raising the temperature to about 700° C.—Marcel **Peschard**: The magnetisation of the ferro-nickels: thermomagnetic properties.—S. **Pina de Rubies**: New lanthanum lines in the arc spectrum at normal pressure between 3100 I.Å. and 2200 I.Å.—Jean **Lecomte**: The infra-red absorption spectrum of aldehydes and ketones. The absorption spectra of the fatty aldehydes and their isomeric ketones are not identical, and the characteristic band of the carbonyl group is not the same in the fatty and aromatic series. For a thickness of a small fraction of a millimetre, aldehydes and ketones give absorption spectra showing well-defined strong bands capable of being utilised for analytical purposes.—R. **de Mallemann**: The electrical double refraction of limonene. Kerr's constant for limonene is intermediate between that of benzene and that of toluene; it is nearly four times that of pinene, a difference attributed by the author to the presence in the molecule of a double bond external to the ring.—L. **de Broglie** and Jean Jacques **Trillat**: The physical interpretation of the X-ray spectra of the fatty acids.—Mlle. Irène **Curie** and Nobuo **Yamada**: The particles of long range emitted by polonium. The lack of homogeneity in the metallic screens employed in previous work was found to give rise to difficulties, and these screens have been replaced by a layer of compressed gas (dried air, oxygen, or carbon dioxide). It was proved that the arresting power of these gases was proportional to the pressure. In spite of the precautions taken in the preparation and preservation of the specimens, there always remained a small number of particles with a long range, and this number is nearly proportional to the quantity of polonium, but does not depend on the nature of the metal on which the polonium is deposited. These particles do not form a homogeneous group.—Georges **Fournier**: The absorption of $\beta$ rays by matter.—Pierre **Chevenard** and Albert **Portevin**: Results obtained by the dilatometric study of cast irons. The dilatometric study of cast iron enables the complex transformations produced during heating or cooling to be followed, and appears to possess advantages over the thermal method for phenomena occurring in the solid state.—Xavier **Waché** and Georges **Chaudron**: The influence of thermal and mechanical treatment on the velocity of solution in hydrochloric acid.—E. **Demoussy**: The displacement of acids by diffusion. The consideration of the relative mobilities of the ions of a mixture of salt plus acid, together with a knowledge of the degree of ionisation of the acid, suffices to predict the direction of the partition of the diffusion products.—H. **Pelabon**: The direct formation of the mercury oxybromides.—Mlle. S. **Leduc**: The action of *p*-anisyl magnesium bromide and *p*-tolyl magnesium bromide on camphor.—L. **Bert**: A general synthetical method for the preparation of $\omega$-chlorallyl cyclic derivatives, and through these, acetylenic hydrocarbons, alcohols, and aldehydes. The reaction

$$RMgX + CH_2Cl - CH = CHCl = RCH_2 - CH = CHCl + MgXCl$$

has been realised experimentally when R is $C_6H_5$. The reaction has been proved to be general for other aryl groups.—Georges **Brus**: The action of chlorine on $\alpha$-pinene. Starting with pure pinene, free from nopinene, the author has obtained bornyl chloride, liquid dichlorides, a crystalline dichloride differing from products previously obtained in this reaction, together with small quantities of higher chlorine derivatives.—R. **Lantz**: The aryliminonaphthoquinones. The action of aromatic amines.—L. **Cayeux**: The submarine origin of the silex nodules and beds of chalk of the Paris basin.—Frédéric **Hermann**: The bundle of reversed folds of Valsavarenche and the prolongations of the Bagnes fan in the Franco-Italian Alps.—A. **Demolon**: The chemical constitution of brick earth.—Aug. **Chevalier**: The Leguminoseæ (Tephrosia) cultivated in tropical countries for capturing fish: their use and geographical distribution.—St. **Jonesco**: The action of mineral and organic acids combined with that of metallic sodium on the reddening of some flavones.—P. **Lasareff**: The sensation of the intensity of sounds according to the ionic theory of stimulation.—R. **Legendre**: The principle of a method for estimating the variations of dissolved carbonic acid.—A. H. **Roffo**: Cholesterol and hæmolysis.—W. **Kopaczewski**: Electrocapillary analysis of colloidal colouring matters.—Ch. **Porcher**: The various complexes, caseinate of lime + phosphate of lime, and their mode of behaviour towards rennet.—G. **Guittoneau**: The rôle of rennet and its mode of action in the manufacture of Gruyère and Emmenthal cheeses.—**Lemoigne**: The origin of the $\beta$-oxybutyric acid obtained by the action of micro-organisms. The non-autolysed *M. bacillus* contains an amorphous product, which can be isolated by chloroform and after saponification gives $\alpha$-crotonic acid. The latter product may be considered as the mother substance of the $\beta$-oxybutyric acid.—Clément **Simon**, Ch. **Flandin**, **Seguin** and **Lecoq**: The action, *in vitro*, of pancreatic extracts on the Nagana trypanosome and *Spirochæta Gallinarum*.—**Robineau** and G. **Contremoulins**: The reactions on the human organism of prothetic or synthetic bone sterilised by boiling alcohol.