

Societies and Academies.

LONDON.

Royal Meteorological Society, May 20.—F. W. Harmer and C. E. P. Brooks: Further remarks on the meteorological conditions of the Pleistocene epoch. The chief difference between the North Atlantic and North Pacific Oceans is that the former is open to the north, while the latter is practically closed to the north. Hence in the Atlantic the Gulf Stream travels north-eastward into the Arctic Ocean, while in the Pacific the Japan current is forced to turn south-eastward along the coast of America. This difference causes differences in the pressure distribution; both oceanic and atmospheric circulation combine to give western Europe a more genial climate than the west of North America. The closing of the Greenland-Europe channel would bring about changes in the oceanic and atmospheric circulations which would suffice to cause a glacial epoch in Europe. The diversion of the storm tracks and the consequent alteration in the direction of the prevalent winds are probably even more important than the changes in the currents. The second part of the paper deals with the climatic changes in the Mediterranean region during the glacial period; the crowding together of the isotherms in southern Europe caused a great increase of storminess there, to which was due the torrential rains of which we have evidence.—Sir Gilbert T. Walker: On periodicity. Proposals that have been made in recent years for modifying Schuster's periodogram; a new criterion for the reality of a period, with some applications to meteorological data, is given.—Harold Jeffreys: On fluid motions produced by differences of temperature and humidity. It has been shown that the maintenance of a difference of temperature between parts of the same level surface in a fluid will necessarily maintain a permanent motion of the fluid, and that heating or cooling a fluid at an internal boundary will also maintain a permanent movement. A corresponding theorem is true for the supply of new constituents instead of heat. This result appears to contradict a theorem given by Sandstrom and Bjercknes, to the effect that a permanent motion is possible only if the place where the heat is supplied is at a lower level than that where it is removed; but the arguments of these authors involve an unstated assumption, which seems to be untrue. Sandstrom's experiment, in which no motion was observed in a tank under conditions suited to the production of a circulation, is capable of a dynamical explanation based on the slowness of conduction and the consequent confinement of the currents to narrow regions where they would be very difficult to observe. It appears unlikely that it will often be possible to proceed by analogy from this experiment to the dynamics of wind, for radiation and turbulence will always redistribute the heat in such a way as to produce general currents; but there may be some applications to ocean currents.—A. H. R. Goldie: Gustiness of wind in particular cases. Deals particularly with examples from the anemograph records of Falmouth Observatory during periods of S.W. wind. It was found that the time interval of the rise and fall of the anemograph pen and of the breaking of the waves on the shore approximated to seven seconds. A further investigation at Lerwick showed that the normal relation between "range of gusts" and "hourly mean wind," in the case of equatorial currents, is about one-third and nearly independent of velocity.

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SHEFFIELD.

Society of Glass Technology, May 25 and 26.—W. E. S. Turner: The nature and constitution of glass. The abnormal properties recently observed in glass when heated in the annealing range (such as greatly increased thermal expansion, heat absorption, and modification of specific electrical conductivity; and the changes of density and refractive index on heat treating glass) have their counterpart in the changes of plasticity which glass exhibits when remelted or when the raw materials have considerable quantities of moisture or of certain salts present. Two fundamental factors are involved; molecular complexity and the presence of compounds in glasses.—G. Tammann: On glasses as supercooled liquids. A discussion of the influence of degree of undercooling, nucleus number, viscosity and other factors on the production of the glassy state. The customary soda-lime-silica glasses may be regarded as ternary mixtures of Na_2SiO_3 , CaSiO_3 and SiO_2 . The two components Na_2SiO_3 and CaSiO_3 crystallise readily, as do their mixtures, from which mixed crystals separate. With an excess of silica the nucleus number of these mixed crystals is reduced extraordinarily, so that mixtures with an excess of 8 per cent. of silica or more solidify as glasses.—A. Q. Tool and E. E. Hill: On the constitution and density of glass. A glass is intermediate between the liquid and solid states. Its condition at ordinary temperatures may be considered as undercooled, not alone with regard to the process of crystallisation, usually known as the true solidification, but also with respect to the completion of many processes normal to the vitreous condition. The maximum density change observed was 1.10.—G. W. Morey and N. L. Bowen: The ternary system sodium metasilicate-calcium metasilicate-silica. The following new compounds have been found and their properties determined. The compound $2\text{Na}_2\text{O}$, CaO , 3SiO_2 , which melts incongruently, forming a liquid richer in Na_2SiO_3 and Na_2O , 2CaO , 3SiO_2 ; the compound Na_2O , 2CaO , 3SiO_2 , which has a congruent melting point at 1284° ; and the compound Na_2O , 3CaO , 6SiO_2 , which melts incongruently at 1045° , forming a mixture of wollastonite and a glass containing approximately 15 per cent. CaO , 67 per cent. SiO_2 .—R. W. G. Wyckoff and G. W. Morey: X-ray diffraction measurements on some soda-lime-silica glasses. (A preliminary note.) In some instances the broad bands thought to be characteristic of glasses have been found. In others narrow bands or lines have been obtained which are as sharp as the lines produced by crystals of colloidal dimensions.—Sir W. H. Bragg: The structure of quartz. Quartz changes its structure on passing through 575° . The high-temperature quartz is more symmetrical than the low, but the change is not severe. The four unknown quantities in low-temperature quartz reduce to one on passing to the high-temperature form; the silicon atoms are fixed, and the oxygen atoms must lie on certain straight lines. Attempts to fix the positions of the oxygen atoms can be made, based on intensity measurements. The most probable value shows, somewhat unexpectedly, that each silicon atom is at the centre of a regular tetrahedron of which the four corners are occupied by oxygen atoms. Assuming that the low-temperature quartz is not very different from the high-temperature quartz, the various twinings of quartz are readily accounted for.—Vaughan H. Stott: The viscosity of glass. Final relations between viscosity and composition, in which errors due to impurities or inaccurate compositions generally are not considerably greater than the errors of the viscosity determinations

themselves, cannot be obtained unless the glasses are prepared from materials of known purity and melted without contamination. This at present precludes the melting of large pieces of glass, and limits the design of viscosimeters.

PARIS.

Academy of Sciences, June 15.—The president announced the deaths of Louis Gentil and Dr. Depage.—A. Haller and René Lucas: The rotatory powers of certain derivatives of camphor. Seven derivatives of camphor were studied. The specific rotatory powers were measured for seven wavelengths ($\gamma=6708$ to 4358) in four solvents (alcohol, benzene, carbon disulphide, cyclohexane). The rotatory power varied considerably with the solvent.—J. Costantin: An old asymbiotic culture at the *Muséum*.—Louis Lumière: Concerning the invention of the cinematograph. A claim for priority.—J. Haag: The probability in a circle.—Bertrand Gambier: Surfaces of which a finite or infinite number of asymptotics belong to a linear complex.—Maurice Fréchet: Abstract point transformations.—N. Lusin: The properties of projective ensembles.—P. J. Myrberg: Automorph functions.—B. Galerkin: The tensions of a prism having a rectangular isosceles triangle as base.—Paul Woog: Measurements of oily friction. Data are given for various oils, either alone or with the addition of fatty acids.—André Metz: A relativist definition of simultaneity.—T. Peczański and G. Mokrzycki: Study of chemical compounds of salts in the electric arc. The distance between the electrodes of the arc and the intensity of the current were kept constant. Mixtures of oxides were placed in a crater on the positive electrode and the fall of potential measured. The curve obtained by plotting composition of the salt mixture against the volts indicated the formation of compounds.—N. Pariselle: Contribution to the study of the rotatory power and dispersion in the terpene series.—N. Pauthenier: The rotating arc between carbon electrodes.—Marcel Peschard: The magnetisation of ferro-nickel: saturations and atomic moments.—Jean Jacques Trillat: Study of soaps and fats by means of the X-rays.—A. Boutaric and Mme. Y. Manière: The influence of very small quantities of foreign substances on the stability of colloidal solutions. The addition of a small quantity of an electrolyte to a colloidal suspension may protect the solution against the flocculating action of an electrolyte, may accelerate the flocculation, or may be without effect. The results of experiments with two different electrolytes on a colloidal solution of sulphide of arsenic are given in the form of a table.—A. Damiens: An artificial magnesium silicate.—V. Auger and T. Karantassis: Researches on the complexes of stannic iodide. The compounds Rb_2SnI_6 , Cs_2SnI_6 , and $[As(CH_3)_4]_2SnI_6$ have been isolated.—P. Lebeau and P. Marmasse: The estimation of carbon dioxide and carbon monoxide. The carbon dioxide is removed by cooling with liquid air, which at the same time removes higher homologues of methane, ethylene, acetylene, and other gases likely to interfere with the iodine pentoxide reaction. The gas is then passed over iodine pentoxide at $150^\circ C$. and the carbon dioxide resulting from the oxidation of the monoxide again removed at $-190^\circ C$. The method has been applied to the determination of carbon monoxide in commercial hydrogen and also to the search for carbon monoxide in gases from borings at Pechelbronn: the results in the last-named gases were negative. Air gave traces of carbon monoxide (less than 5 parts per million).—Paul Pascal: New complexes of iron derived from the triazines.—Charles Prévost: Methylphenylbutadiene.—P. Gaubert: The spherulites of reamurite.—Louis Longchambon: The

polymorphic transformations of silica.—Jacques de Lapparent: The relations between the hydrocarbons and carbonates in silex and the phtanites.—Maurice Jean: The nature of the internal fiber of the seedling of *Convolvulus tricolor*.—A. Tronchet: Polycotly and schizocotly in *Dimorphotheca pluvialis*.—M. Bridel and P. Picard: The preparation and properties of monotropitoid. 60 grams of this glucoside have been extracted from 20 kilograms of bark of *Betula lenta*. Full details of its physical and chemical properties are given. It furnishes methyl salicylate, glucose, and xylose on hydrolysis.—René Jeannel: The homologies of the articulations of the leg in insects.—Stéphane Dombrowski: The permanent regimes of concentration in a convection current and its application to physiology.—Alphonse Labbé: The curves of growth of *Artemia arietina*.

ROME.

Royal Academy of the Lincei, April 4.—Leonida Tonelli: Problem of primitive functions.—Gabriella Armellini Conti: Observations of the position of the planet Uranus on the occasion of its conjugation with 96 Aquari.—O. M. Corbino and E. Persico: Secondary oscillations in a generator with a three-electrode lamp.—A. L. Herrera: Photomicrographs showing karyokinesis figures in metaformaldehyde crystals.—F. Sbrana: Characteristic property of polyharmonic functions and solutions of the equation of vibrating membranes.—Umberto Crudeli: Rutherford-Bohr triangular systems in relative equilibrium.—D. J. Struik: Irrotational waves in channels.—G. Ponte: Vulcanological investigations. Vulcanism causes a gradual impoverishment on the earth, not only of atmospheric oxygen but also of water vapour, similar to that which seems to have taken place with greater intensity on the moon.—E. Adinolfi: Influence of X-rays on the crystallisation of bismuth. X-rays exert on bismuth, during its crystallisation, an effect similar to, but distinct from, that caused by impurities, and varying with the hardness of the rays used.—Enrico Fermi: Relation between the constants of the infra-red bands of triatomic molecules. For these molecules, the three atoms of which must lie in one plane, the expression

$$\frac{1}{\Delta\nu_1} = \frac{1}{\Delta\nu_2} + \frac{1}{\Delta\nu_3}$$

is deduced for the relationship between the constant frequency differences of the lines in the infra-red band. The only triatomic molecule for which the necessary data are available is that of water vapour, and in this case the above equation holds within the limits of experimental error.—U. Sborgi: Electronic theory of the anodic behaviour of metals, especially of those exhibiting passivity phenomena.—G. Malquori: Mixed silver-copper basic salts. Investigation of the system $Cu(OH)_2 - AgNO_3 - H_2O$ indicates the existence of only one mixed basic salt, which has the composition $3Cu(OH)_2, 2AgNO_3, 3H_2O$, and is stable in the presence of silver nitrate solution of concentration not lower than 0.78 per cent.—Luigi Settini: Transformation of nitrogen compounds (proteins) in preserved food produce. In food materials, whether tinned or in contact with the air, the insoluble nitrogen compounds undergo gradual transformation with production of an equivalent quantity of soluble nitrogen compounds.—P. Pasquini: Further considerations on the formation of the pecten in the development of the eye of *Gallus domesticus*. The evolution of the pecten in the development of the fowl's eye consists in a gradual lamination of the original pecten with consequent increase in its height in the vitreous humour; further, the lamina develops longitudinal folds, which increase its surface of contact with the vitreous body.—Umberto D'Ancona: Nerve endings in the somatic muscles of the decapod crustaceans.