SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, June 20.—Dr. W. J. Russell, F.R.S., President, in the chair.—The following papers were read:—Observations on the melting-point of some salicylic and anisic compounds, by Dr. W. H. Perkin, F.R.S. The author, in 1867, described methylated and ethylated salicylaldehydes as colourless liquids which do not solidify when cooled in a freezing mixture, whereas Voswinckel states that methylated salicylaldehyde is a solid melting at 35° (*Ber. der deut. chem. Gesellsch.*, 1882, 2024). Further experiments show that although the methylated aldehyde does not readily crystallize in a freezing mixture it can be made to do so, but the crystals so obtained melt at 2°·7–3°. Prismatic crystals having the melting-point described by Voswinckel were once obtained on evaporating an ethereal solution of the aldehyde, and it is found that if the oily aldehyde is touched with one of these it immediately becomes a solid mass, having a melting-point of 35°; when these crystals are fused, and the resulting oil cooled in a freezing mixture, crystals melting at 2°·7–3° are again formed. It is therefore established that methylated salicylaldehyde forms crystals of two kinds, having melting-points differing by about 32°.—The action of propionyl and butyryl chloride on phenol, by the same. When phenol is acted upon by propionyl chloride, a secondary product, propionyl phenol, $C_3H_5O \cdot C_6H_4 \cdot OH$, is formed in addition to phenyl propionate. A corresponding reaction occurs when phenol is treated with butyryl chloride.—The nature of solutions as elucidated by a study of their freezing temperatures, by Mr. S. U. Pickering. By determining the freezing temperatures of mixtures of sulphuric acid and water, the author has obtained results which in his opinion confirm the existence in solution of the majority of the hydrates of sulphuric acid which have been indicated by a study of the densities, heat of dissolution, heat capacity, and electric conductivity of these solutions (cf. p. 166).—Note on the determination of the molecular weight of substances in solution, especially colloids, by Prof. H. E. Armstrong.—The correspondence between the magnetic rotation and the refraction and dispersion of light by compounds containing nitrogen, by Dr. J. H. Gladstone, F.R.S., and Dr. W. H. Perkin, F.R.S.—Note on the oxidation of paradiamines, by Prof. R. Meldola, F.R.S., and Mr. R. E. Evans. The authors find that the amido-groups of paraphenylenediamine are split off in the form of ammonia, when it is oxidized to quinone by the action of potassium bichromate.—Monobenzyl-derivatives of the phenylenediamines, by Prof. R. Meldola and Mr. J. H. Coste. Monobenzyl meta- and para-phenylenediamines have been prepared, and their oxidation products examined. The paradiamine, when oxidized with an equimolecular proportion of benzylaniline, yields an unstable greenish-blue indamine, and when oxidized with two molecular proportions of benzylaniline at the temperature of boiling water, forms an azine or benzylated safranine which is of interest as being produced, in contradiction to the generally received view, from one molecule of a diamine, and two molecules of a secondary instead of a primary monamine.—Note on a yellow pigment in butterflies, by Mr. F. G. Hopkins. The colour effects on the wings of lepidopterous insects are for the most part probably due to purely physical causes, but in some cases pigments are undoubtedly present. A yellow pigment, which is found in its purest form in the common English brimstone butterfly, and may also be detected in the wings of a very large number of day-flying Lepidoptera, can be obtained from the wings by simple treatment with hot water, in which it is freely soluble, and may be identified by its yielding a marked murexide reaction, when evaporated with nitric acid, and afterwards treated with ammonia or potash. The common brimstone butterfly yields somewhat less than a milligram of pigment from each insect; larger foreign species, such as those belonging to the species *Callidryas*, may yield as much as 4–5 milligrams. Examination of the pigment reveals its near relationship to mycomelic acid, a yellow derivative of uric acid; and the author suggests that it may possibly be a condensation product of uric and mycomelic acids.—Zinc dextrosate, by Mr. A. C. Chapman.—β-bromonaphthalenesulphonic acids, by Mr. R. W. Sindall. It is found that dichloronaphthalenes are chiefly formed when the chlorides of the β-bromonaphthalenesulphonic acids are distilled with phosphorus pentachloride, the bromine atom becoming displaced by chlorine.—Isomeric change in the naphthalene series, No. 5; β-iodonaphthalenesulphonic acids, by Prof. H. E. Armstrong and Mr. W. P. Wynne. A further contribution to the study of isomeric change in the naphthalene series, in which additional evidence, derived from the investigation of the acids obtained on sulphonating β iodonaphthalene under varied conditions, is adduced in favour of the view that the β-derivatives of naphthalene are formed by isomeric change from α-derivatives and not by direct substitution.—The formation of sulphones on sulphonating naphthalene-derivatives by means of chlorosulphonic acid, by Mr. W. M. Heller.—Note on the hydration of cyanides, by Prof. H. E. Armstrong. Unlike the α-derivative, β-cyanonaphthalene cannot be sulphonated; if, however, it is dissolved in fuming sulphuric acid, and the solution poured into water, it is completely converted into the amide of naphthoic acid. In like manner trichloracetonitril, $CCl_3 \cdot CN$, slowly combines with sulphuric anhydride, forming a crystalline compound which on treatment with water undergoes immediate and complete conversion into trichloracetamide. These cases appear to afford striking evidence in favour of the view that hydrating and hydrolytic agents act by forming compounds directly attackable by water; they serve, in fact, to support the integration rather than the dissociation hypothesis of chemical change.—The existence of salicylic acid in certain genera of the *Liliaceæ*, by Dr. A. B. Griffiths. The author states that he has isolated salicylic acid from the leaves, stems, &c., of *Tulipa*, Yucca, and *Hyacinthus*.—On the oxidation products of acenaphthene, by Mr. T. Ewan and Dr. J. B. Cohen.—Schützenberger's process for the estimation of the oxygen dissolved in water, by Sir H. E. Roscoe, F.R.S., and Mr. J. Lunt.—Isomeric change in the phenol series (third notice), by Mr. A. R. Ling.

EDINBURGH.

Royal Society, July 1.—Dr. John Murray, Vice-President, in the chair.—Prof. Tait communicated a paper, by Dr. G. Plarr, on the determination of the curve, on one of the co-ordinate planes, which forms the outer limit of the positions of the point of contact of an ellipsoid of revolution which touches all three planes of reference. By considering an ellipsoid of revolution the number of the equations to be finally solved is reduced to two.—Mr. A. Crichton Mitchell read a paper on the thermal conductivity, and the specific heat, of manganese steel. The thermal conductivity is one-seventh of that of iron, and increases with rise of temperature, but only at half the rate at which the conductivity of iron increases. The specific heat is 1·108 times that of iron—both increasing at the same rate with rise of temperature.—Sir W. Turner described the placentation (zonary) of the halicore dugong.—Dr. W. Peddie discussed the question Does the co-efficient of absorption depend upon the intensity of light? So far as his experiments have gone the answer is (as has hitherto been assumed) in the negative. He used a diverging beam of light, the intensity varying from 1 to 50.—A paper, by Dr. A. B. Griffiths, on the renal organs of the Nematoidea, was submitted.

July 15.—Prof. Chrystal, Vice-President, in the chair.—Prof. Tait read a paper, by Captain P. Weir, on an azimuth diagram, and also read a note by himself on the same.—Two papers, by Sir W. Thomson, on molecular arrangement, and on electrification by flame, respectively, were submitted.—Dr. R. W. Felkin discussed the geographical distribution of some tropical diseases.—Prof. Tait read a note on the compressibility of solutions of sugar. Sugar in solution increases the internal pressure, but not to the same extent as common salt does.—Prof. Berry Haycraft read a paper written by himself in conjunction with Dr. C. W. Duggan, on the coagulation of serum albumen, serum globulin, egg albumen, and vitellin.—Dr. Alex. James discussed a new point in connection with the latent period of muscle contraction.—Prof. Tait read a paper on the time of impact as depending on the masses of the impinging bodies. In the substances experimented on the distortion is proportional to a power of the kinetic energy.—Dr. Alex. Bruce communicated a paper on the segmentation of the nucleus of the oculo-motor nerve, and he also read another on the upward continuation of the spinal cord.—Dr. P. J. White read a description of the skull and visceral arches of *Tæmargus microcephalus*.—Prof. Tait submitted a paper, by the Rev. M. M. U. Wilkinson, on the scalar equations which represent the relations connecting n points. He also read a paper by himself on some novel quaternion formulæ.—Prof. Crum Brown communicated a paper by Prof. Letts and Mr. R. F. Blake on benzyl phosphines and the action of alcohols upon a mixture of phosphorus and phosphorus iodide.—Prof. Tait communicated a paper, by Prof. C. N. Little, on the non-alternate ± knots of the eighth and ninth orders.—The Chairman gave a review of the session.

SYDNEY.

Royal Society of New South Wales, June 5.—Prof. Liversidge, F.R.S., President, in the chair.—The Chairman announced that the Council had awarded the Society's bronze medal and a money prize of £25 to Mr. Thomas Whitelegge, for his paper on the marine and fresh-water invertebrate fauna of Port Jackson and the neighbourhood.—The following papers were read:—Note on the composition of two sugar plantation soils, by W. A. Dixon; and the Australian aborigines, by W. T. Wyndham.—Three new meteorites were exhibited by Mr. H. C. Russell, viz. two from Barratta Station, thirty-four miles north of Deniliquin, weighing 31½ pounds and 48 pounds, sp. gr. 3·706 and 3·429 respectively, and one from Gilgoin Station, near Brewarrina, 67½ pounds, sp. gr. 3·857.—In the course of some remarks respecting the recent heavy rainfall, Mr. Russell (the Government Astronomer) stated that he had no hesitation in saying that if rain equal to that which fell in and around Sydney (*i.e.* 20 to 26 inches) had fallen generally over the catchment areas of Windsor, Richmond, the upper parts of the Hawkesbury, and in the valley of the Hunter, most if not all the towns on their banks would have been swept away.—Prof. Anderson Stuart exhibited (1) the kymoscope, an apparatus he had devised for showing the action of the heart upon the blood in the circulatory system, also the difference in the pulse beats; (2) an appliance or means of showing that the shape of the chest is largely due to gravitation.

PARIS.

Academy of Sciences, July 22.—M. Des Cloizeaux, President, in the chair.—Summary of the solar observations made at the Observatory of the Collegio Romano during the second quarter of the year 1889, by M. P. Tacchini. During this period the solar spots have continued to diminish in number, so that the minimum appears now to have been reached. The protuberances also show a perceptible decrease, their height and expansion being even inferior to those of the previous quarter.—Two solar eruptions, by M. Jules Fenyi. The forms are here reproduced of the two eruptive protuberances of September 5–6, 1888, described in the *Comptes rendus*, vol. cviii. No. 17.—Restoration of the meridian and curve of mean time traced by Monge on the wall of the Ecole de Génie at Mézières, now the Prefecture of the Ardennes, by M. Cochard. At the request of the Mayor of Mézières, the author has carefully restored this interesting monument of the illustrious geometrician, which appears to have been executed by him some time between the years 1780 and 1784. Monge's dial is 5·20 m. high, distance taken on the meridian between the two solstices.—On the variations in the intensity of the current during the process of electrolysis, by M. N. Piltschikoff. In continuation of his previous note on the initial phase of electrolysis (*Comptes rendus*, March 25, 1889), the author here describes a curious phenomenon of transformation of molecular into electric energy, which he has observed in the course of his researches.—On the double elliptical refraction of quartz, by M. F. Beaulard. In a previous communication (*Comptes rendus*, vol. cviii. p. 671), the author described a new method of studying the phenomenon of double elliptical refraction presented by quartz at a direction oblique to the axis. Here he gives the first results of his researches carried on by means of this method.—On the zinc and cadmium chromites, by M. G. Viard. By modifying M. Gerber's process the author has succeeded in obtaining the crystallized chromites of zinc and cadmium which are here described. Their respective densities are 5·29 at 13° and 5·79 at 17°.—On the formation of crystallized alkaline and alkaline-earthy platinates at high temperatures, by M. G. Rousseau. The author here deals with the platinates of baryta and soda, which are shown to be as stable as the manganates and ferrites. They offer a fresh example of the formation of compound bodies at a temperature higher than that at which they are destroyed.—Quantitative analysis of the bicarbonate of soda in milk, by M. L. Padé. During his researches into the causes of the disappearance of the greater part of the alkaline element in the soluble ashes of milk, to which the bicarbonate of soda has been added, the author has discovered an exact method of effecting the analysis of this salt. During combustion about two-thirds of the carbonate of soda are transformed to the phosphate of soda and the carbonate of calcium by reacting on the phosphate of calcium contained in the milk. According to this transformation the phosphate of soda is contained in the ashes of a milk to which the carbonate of soda has been added. But the soluble ashes of a pure milk being but slightly alkaline, and containing only traces of phosphoric acid, in order to ascertain exactly the quantity of bicarbonate of soda that has been added, all that is needed is to take the alkalinity of the ashes and analyze the phosphoric acid contained in them.—Study of a molar of an elephant and of the process by which it is fixed in the maxillary, by M. V. Galippe. The recent death of an elephant in Paris has afforded the author an opportunity of studying the general structure of the gum in this animal, as well as certain pathological lesions, the analysis of which is here given in detail.—Papers were contributed by M. J. Macé de Lépinay, on the interference fringes produced by extended luminous sources; by M. Ad. Carnot, on the ammoniocobaltic tungstates and vanadates; by M. E. Duvillier, on α-diethyl-amido-propionic acid; by M. J. Courmont, on a new bacillary tuberculosis of bovine origin; and by M. H. Wild, on the earthquake of Werny indicated by the magnetic and electric registering apparatus of Pavlovsk.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Proceedings of the National Electric Light Association at its Ninth Convention at Chicago (Boston, Mass.).—The Respiratory Functions of the Nose: G. Macdonald (Watt).—Oceania, Linguistic and Anthropological: Rev. D. Macdonald (Low).—My Lyrical Life: G. Massey (K. Paul).—Memoir on the Anatomy of the Humpback Whale: J. Struthers (Edinburgh, Maclachlan and Stewart).—The Theory of Credit, vol. i.: H. D. Macleod (Longmans).—Health Troubles of City Life: G. Herschell (Hamilton).—Reports of Geological Explorations during 1887–88 (Wellington, N.Z.).—Twenty-third Annual Report of the Colonial Museum and Laboratory (Wellington, N.Z.).—References to Papers in Anatomy: J. Struthers (Edinburgh, Maclachlan and Stewart).—Journal of the Institution of Electrical Engineers, No. 81 (Spon).

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