SCIENTIFIC SERIALS

Poggendorff's Annalen der Physik und Chemie, No. 6, 1876.—From experiments it is here inferred by Dr. Buff, of Giessen, that the heat conductivity of hydrogen and other gases is too small to be demonstrable by the method proposed by Magnus. Hence the supposition of a conductivity similar to that of metals (if aught more is meant, than that hydrogen can, like solid and liquid bodies, transfer heat from molecule to molecule), is unwarranted. On the other hand, hydrogen has a penetrability for heat rays which comes very near that of vacuum. Dry air absorbs 50 to 60 per cent. of heat rays from a source heated to the boiling point of water. The absorptive power of moist air exceeds that of dry air by several percentages, but not nearly so much as has been supposed by some physicists. Rock salt is not perfectly diathermanous to so-called obscure heat rays. Its "heat colour" is rather like that of dry air.—Dr. H. C. Vogel describes some interesting experiments on change in pitch of tone of a moving body; they consisted in observation of the whistle of a locomotive, and the results closely agree with Doppler's theory and calculations.—M. Wiedemann's paper on the laws of passage of electricity through gases is here concluded. The experiments relate to difference of effect according as positive or negative electrode (in the discharge apparatus) is connected to earth, effect of varying length and width of tube between the electrodes, also of varying pressure and gas, the rise of temperature produced by the discharge, effect of heating electrodes, &c. The view M. Wiedemann adopts is, that in discharge, the gas molecules on the electrodes carry off electricity with them, and impart it to others against which they are driven, and these in their turn are impelled against a third set, and so on; the case being similar to that of a row of freely suspended elastic balls, one of the end ones of which is driven against its neighbour. The author further studies the unequal expansion of the positive and negative discharge, the place where the *vis viva* of the moved gas masses is finally transformed into heat, the dark space at the negative electrode and the stratification of the light, and points out the relation in which his results stand to those obtained by Hittorf.—The constants of dielectricity of oil of turpentine, benzol, and two varieties of petroleum, are determined by M. Silow, by the condenser method, and their square roots are shown to correspond closely to the refractive indices of the liquids, with $\lambda = \infty$ (according to Maxwell's law).—Some anomalous phenomena of the gold-leaf electroscope are pointed out by M. Beetz (they indicate a streaming out of electricity from the leaves over the glass).—We note, lastly, a paper of contributions from the Mineralogical Institute of Strasburg University, referring to glaucophane, datolith, safrol, crystalline form and optical properties of isomerous dinitro benzol, &c.

Journal of the Chemical Society, June.—This number contains an extensive and exceedingly interesting paper on some points in the analysis of potable waters, by Prof. Frankland, D.C.L., F.R.S. Some eight years since, Dr. Frankland, in conjunction with Dr. Armstrong, laid before the Fellows of the Chemical Society an account of the observations and experiments made by them during two years on the methods then employed in the analysis of potable waters. During the time which has elapsed since that occasion Dr. Frankland has adopted the combustion and collateral processes then recommended, and nearly nine years' further experience in water analysis induce him to claim for this process the following recommendations:—1. It is the only process which affords trustworthy information respecting the organic matters present in potable water. 2. It alone professes to determine organic carbon in such waters. 3. Its method of determining organic carbon and nitrogen gives fairly accurate results, even in the hands of a comparatively inexperienced analyst. 4. It alone discloses the proportion of nitrogen to carbon in the organic matter of waters. 5. The process can now be conducted in any laboratory with little difficulty, owing to the modifications in the method of evaporation which have been made.—Mr. W. H. Perkin, F.R.S., contributes a paper upon the formation of anthrapurpurin.—Dr. Thorpe, F.R.S., communicates some notes from the laboratory of the Yorkshire College of Science, Leeds, comprising a short paper by Herbert Eccles on the action of the copper-zinc couple on potassium chlorate and perchlorate, one by John Muir on thalliam chlorate, and a third by Dr. Thorpe himself, on the isometric relations of thallium. As usual the remainder of this volume contains numerous abstracts of chemical papers published in British and foreign journals.

THE *Jahresbericht*, 1874-5, of the Swiss *Naturforschende Gesellschaft*, contains a lengthy account of this Society's last annual meeting, held at Andermatt in September 1875. The opening speech was delivered by Prof. Kaufmann, the president, and mainly of geological interest. Amongst a number of smaller papers that were read we note the following more important ones: On the observations of temperature made in the St. Gotthard tunnel; the temperatures of air, water, and of the soil were registered at a great number of different places in the tunnel, as far as it is constructed, both on the north and south sides, by Dr. Stapff.—On the so-called "seiches," oscillation waves observed in Swiss lakes, principally Lake Leman, by Dr. Forel.—On the recent appearance and the damage done by locusts in the east Swiss Rhine districts, and on the banks of the Bieler Lake, by Prof. C. G. Brügger and Alb. Müller.—The other papers are of minor interest.

SOCIETIES AND ACADEMIES

NEW SOUTH WALES

Royal Society, May 17.—Rev. W. B. Clarke, M.A., F.G.S., in the chair.—The officers for the ensuing year were balloted for:—President (*ex-officio*), the Governor, Sir Hercules Robinson, K.C.M.G., &c.; Vice-presidents, the Rev. W. B. Clarke, M.A., F.G.S., Mr. H. C. Russell, F.R.A.S., Government Astronomer; Hon. Secretaries, Prof. Liversidge, Dr. Leibius. The treasurer presented his annual statement, which showed that although the Society had expended a considerable sum during the past year upon furniture and fittings for the new rooms, there was still a very satisfactory cash balance. The Rev. W. B. Clarke then delivered his annual address. The Society was informed that sections were about to be established by the council in order that members who devoted themselves to particular branches of scientific study might have afforded to them more frequent opportunities for meeting and working together than was possible at the more formal general meetings of the Society.

June 7.—The Rev. W. B. Clarke, F.R.S., in the chair.—The chairman stated that the deputation appointed for the purpose at a former meeting, had waited on the Minister for Justice and Public Instruction and had submitted a request to be communicated to the Government for the sum of 3,500*l.* for the erection of a suitable building and 300*l.* annuity for the ordinary purposes of the Society. They were courteously received, and the Minister cordially promised to lay the matter before his colleagues.—Prof. Liversidge, hon. secretary, announced that a large number of members had entered their names for the sections, and gave notice that arrangements had been made for the preliminary meetings of the following sections, viz.:—Section A. Astronomical and Physical Science. B. Chemistry and Mineralogy. C. Geology and Palæontology. D. Biology. E. Microscopical Science. F. Geography and Ethnology. G. Literature and Fine Arts. H. Medical Science. I. Sanitary and Social Science and Statistics. It was mentioned that a large number of gentlemen interested in scientific matters were desirous to be elected into the Society as soon as the above sections were established.—Mr. H. C. Russell, F.R.A.S., Government Astronomer, then read a paper entitled, "Notes upon some Remarkable Errors in Thermometers," which had been exhibited by standard instruments at the observatory. He also exhibited an improved form of heliostat suitable for signalling purposes.

GÖTTINGEN

Royal Academy of Sciences, March 4.—The following, among other papers, were read:—Some important improvements in simple and compound influence-machines, by M. Holtz.—On the constitution of steel and its connection with magnetisability, by M. Fromme. He credits M. Ruths with the true settlement of this question. With small magnetising forces an annealed bar always takes more magnetism than a similar hardened bar. But as the magnetism in the hardened bars increases in greater ratio than in annealed bars, a value of magnetising force is reached, at which the magnetism of the hardened bar reaches that of the annealed, thereafter exceeding it. This indifferent force is smaller the thicker the bar in comparison to its length. With a certain ratio of length and thickness it becomes infinitely great. The contradictions of previous observers are explained when dimensions are taken into account. M. Fromme, using more adequate means, confirmed M. Ruths' results. M. Gaugain has recently got results that fully agree with those of Ruths; but M. Fromme explains them somewhat differently from the French physicist.

April 12.—Contribution to anatomy of the medullated peripheral nerve fibres, by M. Kuhnt.

May 6.—On the conductivity of electrolytes dissolved in water, in connection with the wandering of their constituents, by M. Kohlrausch. The conductivities of electro-chemically equivalent solutions of two electrolytes which have one constituent in common, are inversely as the transference-numbers of the same equivalent; or the product of the conductivity of the solution and the transference number of the common constituent on both sides is the same. The hindrances to movement in dense solutions, it is found, generally affect the kation more than the anion.—On the movement of electricity in material conductors, especially in a conducting ball, by M. Riecke.—Sulphide of carbon as a preserving and disinfecting substance, by M. Zoeller.—On the pressure forces arising from simultaneous motions associated with contractions and dilatations of several spherical bodies in an incompressible liquid, by M. Bjerknes.

June 17.—Theory of unipolar induction and Plücker's experiments, by M. Riecke. He considers first, the induction of a moved magnetic pole on a linear conductor at rest; then the induction of a magnetic pole at rest on a rotating conductor; then applies the principles arrived at to Plücker's experiments; a fourth chapter is on Wilhelm Weber's unipolar induction.—Contributions to anatomy of the Crinoideæ (second article), by M. Ludwig.—Physiology and histology of the central nerve-system of helix pomatia, by M. v. Ihering.—Sulphide of carbon as a preserving substance (second paper), by M. Zoeller. Five drops of the liquid to a litre of air space suffices to preserve the most decomposable fruits and vegetables. These tasted quite fresh after short exposure to the air, and meat quite lost the smell of sulphide of carbon after boiling or roasting, but it had a slight flavour like that of game, which, to most people, is not unpleasant. It appears that sulphide of carbon acts in the way of coagulating albuminous substances and lessens the water-contents of the preserved substances.

VIENNA

Imperial Academy of Sciences, July 6.—On the causes of keratitis after section of the trigeminus, by Dr. Feuer.—Experiments on the heat conductivity of nitrogen, binoxide of nitrogen, ammonia, and coal-gas, by M. Plank. These are, respectively (the conductivity of air being made = 1), 0·993, 0·951, 0·917, 2·670.—Studies on the more recent tertiary formations of Greenland, by M. Fuchs. Several new fossil species are described.

July 13.—Action of current electricity on the motion of protoplasm, on living and dead cell contents, and on material particles generally. Second part: Influence of the galvanic current on dead cell contents; by M. Velten. Very strong induction currents sent through a cell, or a number of cells, set the contents in rotation, which is very like vital rotation, and follows the same laws. The botanical phenomena of circulation, sliding motion, &c., can be well imitated by this means. M. Velten infers that the cause of protoplasm-motions is to be sought in electric currents produced in the living cell contents.—On the advancement of science by professors and private *savans*, the doctrine of geognostic land-types, and the method of geological surmises *à priori*, by M. Boué.—On some elementary infinite series, by M. Igel.

PARIS

Academy of Sciences, Sept. 4.—Vice-Admiral Paris in the chair.—The following papers were read:—New theorems relative to couples of segments making a constant length, by M. Chasles.—Researches on the disappearance of ammonia contained in waters (first part), by M. Houzeau. Water from wells quickly loses its ammoniacal principle in a vessel hermetically sealed. Light favours this disappearance, but is not indispensable to the phenomenon. This suggests the practical process of exposure to the sun. M. Houzeau also found that artificial ammonia added to water (in the form of carbonate of ammonia) quickly disappeared.—Representation of elliptical functions of the first species by means of left biquadratics. Extract from memoir by M. Léauté.—Rectification of a previous communication on determination by the principle of geometrical correspondence, of the order of a geometrical place defined by algebraic conditions, by M. Saltel.—Results obtained by means of new apparatus for extraction of the juices of sugar-cane, by MM. Mignon and Rouart. The plan they have adopted (in Guadaloupe) is partly like that in treatment of beet. They use a rasp or defibrating machine; this process reaches the hardest parts forming the envelope of the cane, and disorganises the cells which are richest in sugar and which most easily escape in the ordinary treatment. In the hydraulic press used, there are two pistons; the smaller gives twelve atmospheres, and acts during the whole of the compression; the action of the larger piston is added, the two together giving a pressure of 80 atmospheres. The results obtained surpass considerably those from ordinary methods. Thus cane simply defibrated and subjected to only one pressure, gave 77 per cent. of its weight of very rich saccharine juice.—On a submarine elevation observed in the Gulf of Arta, by M. de Cigalla. In 1847 and 1865, after some shocks of earthquake, a very dense sulphurous vapour rose from the bottom and destroyed many fishes (such emanations still occur, but less in quantity). The hydrographic maps for 1847 gave 8 fathoms as the depth there. Now recent soundings show that the bottom has risen, forming a cone 300 fathoms in circumference, and with its summit of 2 fathoms 4 feet under the surface. The temperature of the water is not sensibly altered. Objects kept in the water a few days are covered with a light coat of sulphur. The raised ground consists of very small shells, while the neighbouring bottom is of oozy nature.—Observation of American vines attacked by phylloxera, in the environs of Stuttgardt, by M. Schnetzler. Three centres of invasion were discovered in July. The vines infested are all of American origin, and were imported twelve or thirteen years ago, either directly from America, or from France. The insect attacks the roots and rootlets.—Observations of the planet 166, by Mr. Peters.—Discovery of planet 167,—dispatch transmitted on Aug. 29, 1876, by Mr. Joseph Henry, of Washington. The planet was discovered by Mr. Peters of Clinton.—On the characteristics of conical systems, by M. Halphen.—New theory of the numbers of Bernoulli and Euler, by M. Lucas.—On the invention of the pneumatic fire-syringe, by M. Govi. From the *Giornale dei Letterati*, published in Rome about the middle of the eighteenth century, it is shown that the pneumatic fire-syringe, which has been thought to date from 1862 or 1863, was invented and described in 1745 by the Abbé Augustin Ruffo, of Verona, more than half a century before a workman of St. Etienne gave the idea of it to Prof. Mollet, of Lyon, or M. Fletcher experimented with it before Mr. Nicholson.—On the dissociation of bicarbonate of soda at the temperature of 100°, reply to M. Gautier, by M. Urbain. M. Gautier, heating 4 grammes of dry bicarbonate of soda between 100° and 115°, found it completely decomposed in eighteen hours; he infers that in dried blood-plasma, thus heated, the bicarbonate of soda must also be decomposed. M. Urbain denies the inference, because in the latter case the salt is empasted in a substance which forms a varnish round each of its fragments, and this corresponds to the case of heating the salt in a closed vessel, when dissociation does not occur.—Note on the phenomena of digestion in the American Cockroach (*Periplaneta americana*, L.), by M. Plateau. His examination of this insect confirms his former observations, from which he concluded that the digestive juices of insects are alkaline or neutral, never acid.—Researches on the silicified plants of Autun and Saint Etienne; Calamodendreæ and their probable botanical affinities, by M. Renault. Several resemblances seem to favour the supposition that Calamodendreæ have been the ancestors of the present Gnetaceæ.

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