

years, and have furnished much useful information, some of which is here embodied in the opening paper.—Mr. Cooper investigates the driving power of leather belts.—Prof. Chase gives a series of verifications and confirmations of astronomical hypotheses and predictions, and a brief statement of the principles on which they are based.

Journal de Physique, November, 1878.—In a contribution to the theory of vowels, M. Bourseul, after pointing out that there are really as many distinct vowels as there are pitches of sound proper to the mouth, enumerates the vowels (ten in number) which he uses in speaking French. On examining the sounds of the mouth-cavity which correspond to them (apart from absolute pitch), he finds they fall into two divisions, one being in perfect accord with *do* major (*mi, do, sol, mi, do*), the other with *re* (*fa, si, re, fa, si*). This confirms in an unexpected way a principle discovered by the philologist, M. Roehrig, in 1848. He noted the marked difference, or rather antagonism, of certain consonants and certain vowels, and he arranged the latter in two distinct classes, one comprising *a, o, ou*, the other *é, eu, u*. When studying the Tartar and Finnish tongues, he remarked that the vowels in a word of Tartaro-Finnish idiom were invariably of the same class. The derived languages have undergone alterations, whereby the traces of this original principle gradually disappears, still it may be recognised.—With regard to vibratory forms of liquids on circular metallic plates, M. Decharme finds that the widths of the striæ are inversely proportional to the square roots of the numbers of vibrations of the corresponding sounds.—Prof. Crova explains his important mode of comparison of the radiations emitted by calorific and dark sources; and in their continued paper of experimental researches on magneto-electric machines, MM. Mascart and Angot take up mixed machines, *i.e.*, those composed of magnets and electro-magnets.

December, 1878.—M. Deprez here describes the way in which he solves a problem relating to the work of steam in locomotive cylinders, *viz.*, to trace, at a distance, a curve whose abscissæ and ordinates are respectively proportional to the path traversed by the piston and the pressure exercised by the steam on the piston. The solution rests on two principles—(1) Giving the sheet of paper (for the curve) a motion rigorously proportional to that of the piston; (2) Measuring at a certain point and *instantaneously*, the pressure of the steam on the piston.—M. Terquem communicates a paper on the use of plane liquid sheets (from bars and connecting threads) for experimental demonstration and measurement of the superficial tension. The determination in this way agrees with that by observation of the ascent of liquid in a capillary tube, whereas the process of counting drops gives perceptibly higher numbers.—M. Macé du Léguay studies mathematically the subject of potential in electro-dynamics and electromagnetism.

Verhandlungen des naturhistorischen Vereines der preussischen Rheinlande und Westphalens, thirty-fifth year, vol. v. part 1. (Bonn: Max Cohen and Son, 1878.)—Dr. Franz Leydig, herpetological reminiscences of Roessel von Rosenhof. Roessel was born in Nürnberg, 1705, and died there in 1759, and he wrote on amphibian reptiles, insects, crustacea, and spiders, worms and polyps, rotifers and infusoria.—Dr. Förster, a short monograph of some parasitical hymenoptera, in which many new genera and species are described.—P. Hesse, contribution to the molluscan fauna of Westphalia.—Dr. Theodor Wolf, on Cotopaxi and its last eruption on June 26, 1877, with two plates.—Dr. A. von Lasaulx, contribution to a knowledge of the igneous rocks (Eruptivgesteine) in the districts of the Saar and the Mosel, with two plates.

Reale Istituto Lombardo di Scienze e Lettere, Rendiconti, vol. xi. fasc. xvi. xvii.—This contains reports connected with the award of prizes, announcement of subjects for new prizes, &c.

Fasc. xviii.—On the integration of algebraico-differential equations of the first order and degree by means of linear functions, by Prof. Casorati.—On the dominant diseases of vines, by Drs. Garovaglio and Cattaneo.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 19, 1878.—“On the Chemical Composition of Aleurone Grains,” by S. H. Vines.

In the first part of the paper an account is given of some experiments confirming those of Weyl (*Zeitschr. f. physiol.*

Chemie, Bd. i.), which show that the reserve-proteids are stored up in the seeds of the blue lupin in the form of globulins (vitellin and myosin), and that the conglutin extracted from them by Ritthausen is a product of the alteration of these globulins by the reagents used in the process of extraction. Mr. Vines' micro-chemical observations further show that these globulins constitute the aleurone-grains.

In the second part Mr. Vines points out that, in addition to the globulins, the aleurone-grains contain a proteid which is soluble in distilled water. Such a solution of this substance does not become turbid in boiling; it gives a precipitate on the addition of a drop of nitric acid, soluble in excess; it gives the xanthoproteic and Millon's reactions; it gives an immediate precipitate with acetic acid and potassic ferrocyanide; and it gives a bright pink colour when treated with excess of strong caustic soda on the addition of a drop of dilute solution of cupric sulphate. This substance does not dialyse. These properties show that it belongs to the group of the peptones, and that it most resembles the *a* peptone of Meissner, or, adopting Kühne's nomenclature, hemialbumose, a name which may be provisionally applied to this substance also. The discovery of this substance is of interest in connection with the researches which have been made during the last few years into the existence of peptic ferments in the seeds and other parts of plants.

Linnean Society, Dec. 19, 1878.—Prof. Allman, president, in the chair.—A note on South African orchids, by W. Mansell Weale, was read by the secretary, and a series of drawings illustrating the above, and also other plants from the same region were likewise exhibited on the part of Mr. Weale. He points out that the supposed generic characters of *Mystacidium* and *Polystachyon*, founded on the “two-legged” caudicles of the pollinia, are fallacious.—In a short paper consisting of a description of some rare shells, by Mr. Sylvanus Hanley, *Melania Limborgi*, from British India, and *Leptomya grivada*, of uncertain habitat, were specially referred to as being unusual in several respects.—An interesting communication on the relations of *Rhabdopleura* was made by the president.—Messrs. F. M. Campbell, J. L. Hamilton, and J. J. McAndrew were elected Fellows of the Society.

Entomological Society, Dec. 4, 1878.—Mr. H. W. Bates, F.L.S., F.Z.S., president, in the chair.—The following elections took place: Mr. T. P. Newman as a Member, and Mr. J. Walker, R.N., as a Subscriber.—Mr. Stainton exhibited a series of specimens of *Glyphipteryx schanicolella* taken by Mr. Threlfull near Witherslack.—Mr. Wood Mason exhibited and made remarks upon a stridulating beetle belonging to the *Rutelida*.—Prof. Westwood exhibited some insects and diagrams illustrative of so-called monstrosity, and contributed remarks thereon.—Mr. McLachlan exhibited a series of cases of the larvæ of Trichopterous insects forwarded to him by Dr. Fritz Müller of Santa Catharina, Brazil, one of which, Dr. Müller stated, had the peculiar habit of living on trees in the water that collects between the leaves of *Bromelia*, in which tadpoles, the larvæ of dragon-flies and other aquatic animals were also to be found. Mr. Bates stated that rain-water collects at the bases of the leaves of these plants and remains there for nine months out of the twelve. Dr. Müller had also forwarded a photograph of a number of cases which he considered to belong to some species of *Hydropsychida*, and in his own words, “make a funnel-shaped entrance to their houses with a net of which no spider need be ashamed.” In reference to the opinion of Dr. Müller as to the homologies which appeared to exist between the neurulation of various *Lepidoptera* and that of *Trichoptera*, Mr. McLachlan expressed his own belief that in a linear arrangement the orders *Lepidoptera* and *Trichoptera* should not be widely separated.—The Rev. A. Eaton exhibited a piece of “Kungu cake” from Lake Nyassa district, where, according to Livingstone and others, it is used extensively as food by the natives, who manufacture it from large quantities of a minute insect, conjectured to be a species of *Ephemerida*. From an exhaustive examination, however, Mr. Eaton found it to be a minute representative of the *Culicida*, probably belonging to the genus *Corethra*. In connection with the subject of insect-food as used by man, Mr. Distant remarked, he had learned from Mr. Chennell that *Erthesina fullo*, a very common eastern hemipterous insect was largely eaten by the Naga Hill tribes of North-eastern India.—Mr. Meldola in reply to some queries forwarded to him, as to the chemical composition of the bodies of insects, remarked that

the chitine, which comprised the horny external portion of the bodies of insects had been shown by analysis to contain about 6 per cent. of nitrogen; and as regards phosphates, Mr. Wm. Cole had burned some insects and found phosphoric acid in the ash.—Mr. Waterhouse forwarded for exhibition a living *Curculio*, found in an orchid house at Windsor, which was identified as one of the *Calandridæ*.—The Secretary read the report of the sub-committee appointed to consider the communication from the Board of Trade regarding the ravages of *Anisophia austriaca* at Taganrog.—Mr. Butler communicated a paper on a collection of Lepidoptera from Cachar, North-east India.

Photographic Society, December 10, 1878.—James Glaisher, F.R.S., in the chair.—Papers were read, by Henry Cooper on a really reliable dry-plate process, by L. Warnerke on a case of the destruction of the latent image on washed emulsion, and its restoration, by W. Willis, jun., notes on the platinotype process, and by Edwin Cocking on the subjective and objective of pictorial photography.—Mr. Willis, in demonstrating his new platinum process, stated that ferric oxalate is sensitive to light, and then becomes ferrous oxalate; this, when dissolved in a hot solution of potassic oxalate, reduces the metal from chlorides and other salts of platinum. A sheet of paper is coated with a solution of ferric oxalate and potassic chloro-platinite, and then exposed to light under a negative; this produces a visible brownish ferrous image; it is then floated for a few seconds upon a hot solution of potassic oxalate and potassic chloro-platinite, the ferrous image becomes dissolved, and the combination thus formed reduces the platinum salt and forms the ultimate picture in metallic platinum.

VIENNA

Imperial Academy of Sciences, November 14, 1878.—The following among other papers were read:—On a meteoric stone which fell at Dhulia, Hindostan, in November, 1877, by Dr. Brezina.

November 21, 1878.—On the behaviour of halogen derivatives of aromatic bodies towards water and lead oxide, by Professors Lippmann and Schmidt.—On the Clintonite group, by Prof. Tschermak and Herr Sipörz.—On the meteorite fall of Tieschitz, by Prof. Tschermak.

PARIS

Academy of Sciences, December 30, 1878.—M. Fizeau in the chair.—The following papers were read:—Reply to M. Berthelot, by M. Pasteur. M. Trecul made some observations on the subject.—Borings undertaken by M. Roudaire, in view of the formation of an interior African sea, by M. de Lesseps. M. Roudaire writes on December 11, 1878, that having reached a depth of 18 metres, nothing but sand and water had been met with (no rocks). An explanation is offered of the exceptional tide of 2.50m. in the Gulf of Gabes.—M. Daubrée presented a map of the itinerary of Prof. Nordenskjöld in the glacial sea of Siberia, from August 7 to 27 last.—M. Cahours presented the three first vols. of the fourth edition of his treatise on general elementary chemistry. He indicates the additions and alterations made.—Report on the diplograph of M. Recordon, and his apparatus for use of the blind. This diplograph enables the blind person to produce ordinary writing and a seeing person to produce mechanically the characters the blind person can understand. It consists chiefly of two discs carrying respectively the signs and characters, and which are simultaneously applied to two sheets of paper, impressing the letter recognised by touch or by sight. M. Recordon is making a musical diplograph.—Harmotome and stilbite, by M. Gaudin. This is a study in atomic composition and arrangement (the two minerals contain 179 and 175 atoms respectively).—On electrochemical actions under pressure, by M. Bouvet. The decomposition of water by a current is independent of pressure. The quantity of electricity necessary to decompose a given weight of water is sensibly the same, whatever the pressure at which decomposition occurs. Oxygen and hydrogen, whatever the pressure, are liberated with equal facility, and there are no secondary phenomena causing recombination, &c.—On the decomposition, at ordinary temperature, of an alkaline silicate by a salt of alumina (artificial hydrophane), by M. Monnier.—Determination, by M. Eydlen's method, of the motion of the planet 103 Hera, by M. Callandreau.—On an interpretation of the imaginary values of time in mechanics, by M. Appell.—On an intuitive law according to which is distributed the weight of a solid circular disc, supported by an elastic horizontal base, by M. Boussinesq. The charge supported by each element of the base is that which would be directly over this element if we supposed the total charge distributed uni-

formly over the convex surface of a hemisphere, having the same base as the disc.—M. Joubert acknowledged M. Becquerel's priority in the experiment of magnetic rotation of the plane of polarisation under the earth's influence. The account had escaped his notice.—On a very precise way of observing the contact between the mercury and the ivory point in the basin in Fortin's barometer, by M. Goulier. The author has adopted a method similar to that indicated by M. Le Chatelier many years ago.—On the use of the telephone and microphone for scientific researches, by M. Hughes. This shows how delicate a means of observation these two instruments afford in researches relating to very weak currents, such as those from movement of a magnet before a helix. Several experiments are detailed.—On a new electric lamp, by M. Ducretet. The chief feature of this is the use of a column of mercury in which are immersed one or several crayons; the difference of density produces a thrust, which brings the crayons constantly and regularly to their point of application in proportion as they are consumed. One part of them becomes incandescent. An equal resistance in the circuit is insured, whatever the length and consumption of the crayons.—On the existence and conditions of formation of oxide of nickel, Ni₃O₄, by M. Baubigny.—On the nitrates found in beets and some other roots, by M. Barral. The greatest quantity of nitre per cent. of dry matter is found in the largest beets, and also in those that have least sugar. Beet is thus often given injuriously to cattle. In carrots, potatoes, and hay, 1 cc. (at the most) of bioxide of nitrogen was got in treating 5 to 10 grammes of dry matter, whereas for various beets the quantity never came below 14 cc.—Inertia of derivatives of chromium compared with the action of vanadium on salts of aniline in presence of chlorates in printing with aniline black, by M. Witz.—Analysis of raw sugars and saccharine matters; determination of water and all salts with mineral bases and organic acids, by M. Laugier.—On the harmlessness of borax in conservation of meat, by M. de Cyon. In M. Jourdes' process the borax is sprinkled lightly on the surface, and the meat retains its nutritive value. Prof. Panum, of Copenhagen, has proved the innocuity of borax and boric acid in meat-preserving.—Researches on the physiological action of *maté*, by M. Couty. It excites only, or at least primarily, the sympathetic system in those organs that are most independent of the nerve-centres; such as the intestines, the bladder, the accelerating nerves of the heart.—Poison of serpents, by M. Lacerda. The poison of certain serpents contains figured ferments showing remarkable analogies to bacteria.—On the function of chlorophyll in green Planaria, by M. Geddes. The gases they give off in sunlight contain 45 to 55 per cent. of oxygen, the rest nitrogen; hardly any carbonic acid.—Geological observations on Majorca and Minorca, by M. Hermite.

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