

of the Scotch "Cannel coal." In all these *fresh-water* diatoms were found to be more or less numerous. The three specimens yielded different species of Diatomaceæ, but no new forms were detected. The coal for examination was finely pulverised, then placed in a piece of combustion tubing and heated to redness, a gentle stream of oxygen being passed over the substance. The temperature must not be raised too high, in order not to fuse the siliceous skeletons of the Diatomaceæ. The residue is to be treated with nitric acid and chloride of potash, and heated, then washed carefully with distilled water, and mounted in the usual way. The examination of other varieties of coal would no doubt yield results of the highest interest and importance.—The second paper, "Beiträge zur Theorie der Pflanzenzelle," is by Dr. J. Tschistiakoff, and is devoted to the development of the pollen of *Epilobium angustifolium*. The chief point in the paper is the description of the pro-nucleus, which is also to be met with, according to Tschistiakoff, in the spores of Cryptogams. In the mother-cells of the pollen-grains the protoplasm becomes differentiated into certain zones or regions, one called the pro-nucleus, which contains the nucleolus. The pro-nucleus becomes more differentiated during the growth of the cell, and may divide or disappear. When new pro-nuclei are formed, one ultimately becomes developed into the true nucleus of the cell. The paper is illustrated by five plates.—The last paper is upon the development of the Prothallium of the Cyatheæ, by Dr. Hermann Bauke. The species chiefly examined were: *Cyathea medullaris*, *Alsophila australis*, and *Hemitelia spectabilis*. The paper treats of—1. The germination of the spore and the development of the Prothallium; 2. The development of the Antheridia; 3. Development of the Archegonia and Fertilisation; 4. Male Prothallia and proliferation of Prothallia; and 5. Anomalies. The general results of the paper show that in most points the development of the Prothallium of the Cyatheæ agrees with that of the Polyodiaceæ. A special peculiarity is the occurrence of one rarely of two, stalk-like cells to the Antheridium. The subject is exhaustively treated, and it is illustrated by five plates.

Reichert und Du Bois-Reymond's Archiv für Anatomie, Physiologie, &c., 1875. No. 1, May.—On the Pronation and Supination of the forearm, by Hermann Welcker, Halle. The author believes that the motions of pronation and supination should be regarded not merely as movements of rotation, but also as hinge-movements about an axis passing through the middle of the head of the radius and the styloid process of the ulna. For the term "extreme supination" he would substitute dorsal flexion of the radius; for "pronation," volar flexion of the radius. The actions and positions of the muscles concerned are carefully analysed, and diagrams are given illustrating and supporting the view taken.—Another paper by the same author discusses the effect of the ileo-tibial tract of the fascia lata.—In a paper on the partial excitation of nerves, Hermann Munk gives a *résumé* of his previous papers on the various effects produced on the fibres of nerves according to their situation with respect to the electrodes used, and attributes the contradictory results attained by Rollet and Bour, who believe in a difference of functional irritability in different nerve-fibres, to their having used induction-currents, while he had used constant currents in his experiments.—Dr. Dönhoff points out that calves born early in the year have a longer and thicker coat of hair than those born later in the season; and that this occurs indifferently whether the mother is kept in the stall all the year round, or only passes the winter in the stall.—Dr. Wenzel Gruber, of St. Petersburg, describes a case of the occurrence of the lateral tuberosity of the fifth metatarsal bone as a distinct epiphysis, and two cases of epiphyses on the tubercle of the trapezium.—Dr. von Ihering, in a paper on the temporal ridges of the human skull, supports Hyrtl's description of two temporal ridges, of which one or other is usually better developed. He comes to the conclusion that the upper ridge is related to the temporal fascia, and the lower to the limit of the temporal muscle, and that the temporal ridges in man correspond accurately with those of the anthropomorphic apes. He figures skulls of a Paumotu Islander and of a Hungarian in the Göttingen Museum, as instances of remarkably prominent temporal ridges.—Dr. Albert Adamkiewicz, of Königsberg, contributes a remarkable paper on the analogies to Dulong and Petit's Law of Specific Atomic Heat in Animal Temperature. He conducted an elaborate series of experiments to determine the influence of the surrounding temperature and the size of the body on the specific temperature of the animal, and to discover the physical explanation of the results attained by physiological experiments

on temperature. The paper extends over nearly seventy pages, and it is impossible here to do more than indicate the subject of inquiry.

No. 2, July.—This number, in addition to the conclusion of the last-named paper, contains another by Dr. Adamkiewicz on the conductivity of muscle for heat. The conclusion drawn from experiment is that on a scale representing the conductivity of copper as 1000, water as 1.4, and that of air as 0.05, the conductivity of muscle is represented by 0.6.—J. Steiner, of Halle, gives the results of experiments with curare on fishes, newts, molluscs, starfishes, holothurians, and medusæ. He finds that in fishes there is paralysis of the central organ of voluntary motion, of the respiratory centre, and of motor nerves, and that the times at which the effects appear are in the order named. The period at which paralysis of motor nerves sets in, is much later than in higher vertebrates. In the electrical rays the power of the electrical nerves remains much longer than that of motor nerves. In crabs the phenomena are similar to those in fishes, but they appear still later. In molluscs, starfishes, and holothurians, there is only a paralysis of the central organ of voluntary motion. Curare appears to have no effect on medusæ.—Fanny Berlinerblau describes a case of direct transition from arteries to veins in the human subject.—E. Tiegel gives an account of the physiological effect of a capillary electrical current.—Dr. W. Gruber has four papers—(1) on the occurrence of a second zygomatic bone in man; (2) on the pso-hamatus muscle; (3) on an anomalous extensor digitorum communis in the hand, and a similar anomaly in the extensor digitorum longus in the foot; and (4) on the flexor pollicis longus.—W. Krause figures a human embryo at about the fourth week, with a pear-shaped allantois.—E. Meyer gives an account of comparative investigations in the mammalia on the cause of the pale or red appearance of striated muscles, and concludes that the shade of colour varies with the work done by them.—Prof. Aeby, of Berne, has a paper on the sesamoid bones of the human hand.

The *Geographical Magazine*, August.—In connection with Lieut. Cameron's explorations, Mr. C. R. Markham takes occasion to give an interesting *résumé* of the history of the discovery of the course of the Congo, and strongly advocates that relief should be sent out to Cameron.—An interesting sketch follows of the journey of Chekanovski and Müller to the Siberian river Olena (Olenek), in 1873-74; this is illustrated by a sketch-map.—The number also contains a large sketch-map of the countries between Kashmir and Panjikrah, including Chilas, Kanda, and other districts of Dardistan, compiled by Mr. Ravenstein from the most trustworthy recent sources.—"Signposts on Ocean's Highway.—The Physical Education of Dust.—Mountains," is the title of an article by Mr. H. P. Malet.

SOCIETIES AND ACADEMIES

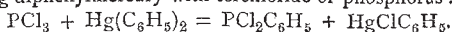
VIENNA

Imperial Academy of Sciences, April 1.—On cold mixtures, with special reference to those consisting of snow and sulphuric acid, by Prof. Pfandler.—On palæogeological geography, by Dr. A. Boué.—On the carboniferous lime fauna of the Barents Isles (in the N. W. of Novaya Zemlya), by Dr. F. Toula; this interesting paper contains a list of no less than one hundred different species found in that remote locality.

April 15.—The following papers were read:—On anomalous dispersion, by Prof. E. Mach.—On a new direct proof for the rotation of the earth, by F. v. Sedlmayer Seefeld.—On the generating of nitrogen from the albuminoid matter undergoing assimilation in the body, by Prof. J. Seegen and Dr. Nowak.—On an apparatus for the determination of the mechanical equivalent of heat, by H. J. Puluj.—On the orbit of Planet (III.) Ate, by Director von Littrow and Dr. Holetschek.—On the variability of diurnal temperatures, by Dr. J. Hann.—On the function of lime with germ-plants of *Phaseolus multiflorus*, by Prof. J. Boehm.—Several papers of minor interest.

BERLIN

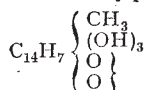
German Chemical Society, July 12.—A. W. Hofmann in the chair.—A. Borodin, in treating an amarine salt with nitrite of potassium, has obtained a nitrosoamarine. He concludes amarine to be an imidobase.—A. Michaëlis and F. Graeff have discovered a new mode of formation of phosphenylic chloride, by treating diphenylmercury with terchloride of phosphorus:



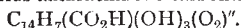
J. V. Janowsky published new analyses of the mineral Cronsted-

tite.—A. Kundt and E. Warburg have investigated the specific heat of the vapour of mercury. Their reason for doing so was the exception shown by most vapours with regard to the kinetic molecular theory of Clausius. If c signifies the specific heat of a gas of constant volume, and c' the specific heat of the same gas at constant pressure: then $\frac{c'}{c}$ according to that theory should be = 1.67, while most gases have been found to possess the coefficient = 1.405. Mercury-vapour affords a particular interest, because its molecule is monatomic compared with those diatomic volumes of most other gases. It was found to coincide with the law of Clausius $\frac{c'}{c}$ having been found 1.67.—A. Schüller and V.

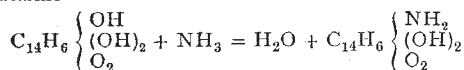
Wartha described a new ice-calorimeter, a modification of Bunsen's instrument which offers the facility of applying ice which is not entirely pure.—F. Beilstein, as also A. Claus, described derivations of dichlorobenzoic acid.—R. Gnehm described derivatives of diphenyl-amine.—V. Meyer and Lecco have treated iodide of tetramethyl-ammonium with iodide of ethyl, and also iodide of tetrachylammonium with iodide of methyl, without observing in either case an exchange of ethyle against methyl.—W. Klobukowsky and E. Nötting have made researches respecting the constitution of rufgallic acid, which lead them to adopt the formula formerly described by M. Jaffé.—Ph. Zöllner and E. A. Grete have added some new observations on xanthogenic salts as a remedy against Phylloxera. Amylic xanthogenate appears to be as efficacious as the corresponding ethylxanthogenate. Amylxanthogenate of potassium can be prepared in Vienna at the price of 3*l.* a hundredweight.—C. Liebermann has submitted emodine, the substance accompanying chrysophanic acid in the root of rhubarb, to new researches. He considers it as methylpurpurine—



By oxydation it yields anthrachinone-carbonic acid—



Heated with powdered zinc, emodine yields anthracene.—C. Liebermann and E. Fischer have transformed purpurine into amidoalzarine—



This body, by the action of nitrous acid, gives an isomerid of alizarine, viz., purpuroxanthine.—A. Pinner found chloracrylic acid to be transformed by water into malonic acid.—H. Gabriel has studied the body called ammelide by Gerhardt, and has found the formula $(C_3N_3)NH(OH)_2$ predicted by this chemist.—P. Meyer has prepared a number of derivatives of glycoooll, containing phenyl or tolyl and chlorine, obtained by the action of aniline and toluidine on the chloride of chloracetic acid. He likewise has studied the action of those bases on the ether of chloracetic acid.—C. L. Jackson has found in the residues of aniline obtained from a German manufactory a base homologous with xenylamine, viz., $C_{13}H_{13}N = C_{13}H_{11}NH_2$. The radical being most likely, tolylphenyl.

PARIS

Academy of Sciences, Aug. 2.—M. Frémy in the chair.—The following papers were read:—On the magnets formed of compressed powders, by M. J. Jamin.—Memoir by M. N. Joly, entitled: A gap in the teratological series filled up by the discovery of the genus "Hedadelphia."—On neutral substrata, by M. Weddell. This paper relates to another one read by M. Contejean at the meeting of July 19, with reference to botanical geography.—A critical examination of the basis upon which the calculus generally used to estimate the stability of bridges with metal supports and straight prismatic beams, is based; with propositions for the adoption of a new basis, by M. Lefort.—On the integration of an equation with partial differentials of the second order, by M. N. Nicolaidès.—On the recurrent sensibility of the peripheral nerves of the hand, by M. A. Richet.—Researches on the nodules of oligoclase in the lava of the last eruption of Santorin, by M. F. Fouqué.—On the method of buying beetroot by the density of their juice, by M. Durin.—On microzymata and their functions in the different ages of one and the same being, by M. J. Bechamp.—A new process for the determination of free oxygen in urine, by M. D. Freire.—

Observations by M. Blanchet, on the project of creating a sea in the interior of Africa.—A memoir by M. P. Maille, on cyclones. On the variations in the brilliancy of Jupiter's fourth satellite, with deductions regarding its physical constitution and its movement of rotation, by M. Flammarion. The author states the following results of his observations: The IV. satellite of Jupiter undergoes considerable variations in its brilliancy and appears to us as a star between the 6th and the 10th magnitudes. As its phases as seen from the earth are hardly perceptible, we conclude that its physical constitution is absolutely different from that of the moon. There is a probability (but no certainty) in favour of the hypothesis that it revolves like the moon, presenting always the same face to the planet. In that case, its brightest hemisphere would be that which it turns towards the sun when on the superior western quarter of its orbit, and its darkest hemisphere the one it turns towards the sun when it stands in the lower eastern quarter of its course. This hypothesis does not account for all the variations observed, and this little world seems to undergo atmospherical revolutions which cause its reflecting surface to vary at any point of its orbit. It appears sometimes nebulous and dim. Its reflecting power is as a rule inferior to that of the three other satellites of Jupiter.—On molecular combinations by M. C. Friedel.—On the complete separation of arsenic from animal matter and on its determination in the different tissues, by M. Arm. Gautier.—On the determination of glucose in wine, by M. A. Bechamp.—On the breaking off of the teats of guinea-pigs, by M. de Siney.

BOOKS AND PAMPHLETS RECEIVED

BRITISH.—Proceedings of the Liverpool Naturalists' Field Club, 1874-75.—The Celt, the Roman and the Saxon: Thos. Wright, F.S.A. 3rd edition, revised (Trübner and Co.)—Proceedings of the Bristol Naturalists' Society, N.S., Vol. i. Part 2.—Jenkinson's Practical Guide to Carlisle, Gilsland, Roman Wall, &c. (Stanford); and smaller edition of above.—Rocket Floats and Rocket Rams: Chas. Meade Ramus (Stanford).—A Practical Treatise on the Diseases of the Eye: Haynes Walton, F.R.C.S. (J. and A. Churchill).—The Annual Address of the Victoria Institute: Rev. Robert Main (Hurdwicke).—Our Summer Migrants: J. E. Harting, F.L.S., F.Z.S. (Bickers and Son).

FOREIGN.—Schriften der Naturforschenden Gesellschaft in Dantzig, 3 Band, 3 Heft.—Notes sur des Empreintes d'Insectes Fossiles: A. P. de Borre (Brussels, De Veuve Nys).—Sitzungsberichte der Gesellschaft der Wissenschaften in Prag, 1874.—Grundzüge einer Theorie der Cubischen Involutionsen: von Emil Weyr (Prag).—Zur Lehre der Parallelen Projection und der Flächen: von Prof. Dr. W. Matzka (Prag).—Schildern im Gebiete des Kohlengebirges von Böhmen: von Mdr. O. Teismantel (Prag).—Das Jeoklin's Krystallsystem: von J. Krejzl.—Ueber die Chemische Konstitution der Natürlichen chlor- und fluorhaltigen Silikate: von Dr. A. Sfarik (Prag).—Mémoires de la Société des Sciences de Liège. Second Series, Vol. iv. (Brussels).—Die Periodischen Bewegungen der Blattorgane: von Dr. W. Pfeffer (Leipzig, W. Engelmann).

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