

develop the image of the spot in red on a dark ground. A similar method probably may serve to develop the athermic lines in the ultra-red region of the solar and other spectra.

### OUR BOTANICAL COLUMN

**FERULA ALLIACEA.**—The late Mr. D. Hanbury was a valuable and frequent contributor to the Kew Museums, and the very last contribution made, or rather bequeathed by him, has a scientific as well as a melancholy interest. The specimen in question was a fine umbel, bearing ripe fruits of *Ferula alliacea*, Boiss., the label to which we believe was written at his dictation just before his death. Seeds of this plant were also received at Kew from him some time before the receipt of this specimen, and these have germinated, and, though healthy, are as yet naturally very small plants. In the "Pharmacographia" Mr. Hanbury refers to this plant as exhaling a strong odour of Asafetida, but says it is not known as the source of any commercial product. In contradistinction of this, however, Mr. W. Dymock, Professor of Materia Medica at Bombay, writing on the Asafetidias of the Bombay market in a recent number of the *Pharmaceutical Journal*, says that this plant produces one of the distinct kinds known in the above drug market under the name of "Abushahere Hing," and is brought from the Persian Gulf ports, principally from Abushaher and Bunder Abbas, and is produced in Khorassan and Kirman. The specimens received at Kew from Mr. Hanbury appear to have been first received by him from the author of the paper in question, for he refers to having sent such specimens; therefore, if the specimens are authentic, there is no reason to doubt the truth of the statement made by Mr. Dymock, that the drug which appears in the Bombay Customs Returns as Hing or Asafetida, is produced by this plant. It arrives in Bombay either in skins sewn up so as to form a flat oblong package, or in wooden boxes. Its appearance varies according to age, being soft, and about the thickness of treacle when quite fresh, and of a dull olive brown colour and a pure garlic odour. It becomes hard and translucent and of a yellowish brown colour after being kept some time. Slices of the root are found mixed with the resin in about equal proportion. In 1872-73 as many as 3,367 cwt. of this drug were imported into Bombay from the Persian Gulf. The information given in the paper from which we have quoted the above particulars seems to be of a trustworthy nature, and will prove a valuable addition to what we already know of the Asafetidias.

**DIVERSE EFFECTS OF THE SAME TEMPERATURE ON THE SAME SPECIES IN DIFFERENT LATITUDES.**—In the *Comptes Rendus des Séances de l'Académie des Sciences*, June 1875, Mr. A. de Candolle gives the results of some experiments instituted by himself last winter to determine the degree of influence of heat on the vegetation of the same species under otherwise diverse conditions. The sudden burst into life and the rapid development of the vegetation of northern regions is proverbial; the advent of mild weather seems to bring at once into activity the accumulated vital energies, and growth is exceedingly rapid. In the south the same temperature would have far less visible effect on the same species. De Candolle has attempted by direct experiment to ascertain to what extent this influence is exercised. For this purpose he procured specimens of several common deciduous trees from Montpellier, and submitted them to the same temperature as, and with, specimens of the same species collected at Geneva. In the ordinary course of things the same species came into leaf from three weeks to a month earlier at Montpellier than at Geneva, but the specimens from the south, by the side of the northern specimens, did not unfold their leaves so early as the latter by about three weeks. The White Poplar Hornbeam and Tulip Tree were the principal trees employed. Catalpa, a very late leafing subject, exhibited less diversity in this respect. This phenomenon is equally striking in cereals and other cultivated plants. The learned author attributes these differences in effect mainly to the fact that vegetation, or external growth, never entirely ceases in the south, whereas in the north there is a long period during which internal changes and modifications of substances alone is carried on.

### SCIENTIFIC SERIALS

*The American Journal of Science and Art*, July.—The original articles are:—On the United States Weather Map, by E. Loomis, which we have already noticed.—On a magnetic proof

plane, by H. A. Rowland. The apparatus required is a small coil of wire  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in diameter and containing 10 to 50 and a Thomson galvanometer. Having attached the small coil (or magnetic proof plane, as Mr. Rowland calls it) to the galvanometer, it has to be laid on the required spot and then suddenly pulled away and carried to a distance, and the momentary deflection of the galvanometer will be proportional to that component of the lines of force at that point which is perpendicular to the plane of the coil. By a coil of this kind it is possible to determine the intensity of the magnetic field at any point, and thus be able to make a complete map of it. Illustrations of the method are given.—On pseudomorphs of chlorite after Garnet at the Spurr Mountain Iron Mine, Lake Superior, by Raphael Pumpelly, with a coloured plate of a section magnified  $\frac{2}{3}$ .—A brief note on the application of the horizontal pendulum, by Harcourt Amory.—Explosive properties of methyl nitrate, by Carey Lea. This communication describes a new method and the requisite apparatus for preparing it, so that danger is reduced to a minimum.—On zonochlorite and chlorastrolite, by G. W. Hawes.—On glycogen and glycooil in the muscular tissue of *Pecten irradians*. The glycogen has the formula of the sugars of that of the starch group plus a molecule of water. The amount of glycooil occurring in the tissue is small. Analyses are given.—On Dr. Koch and the Missouri mastodon, by Edmund Andrews. The object of the article is to show that Dr. Koch's testimony contributes nothing reliable on the question of the occurrence of human remains in conjunction with the mastodon.—On the rate of growth of corals, by Prof. Joseph Le Conte. Examining a grove of madrepores he noticed that all the prongs grew to the same level, which at the time were very near the surface; and that all of them were dead at the tips for about three inches. The varying level of the ocean at the place is known from the Coast Survey Report, and as it seems that during the high water the madrepores grow up, the living points of the madrepores grow up till the descending water-level exposes and kills them down to a certain level; with the rise of the mean level again new points start upwards. The annual growth, calculated from the known rise and fall of water level, is from  $3\frac{1}{2}$  to 4 inches per annum.—Results of dredging expeditions off the New England Coast in 1874, by A. E. Verrill. Lists of species are given.—Examination of gases from the meteorite of Feb. 12, 1875, by A. W. Wright.—Discovery of two new asteroids, 144 and 145, by C. H. Peters. The diameter of 144 is as the 10th, and 145 as 11.5.—The discovery of a method of obtaining thermographs of the isothermal lines of the solar disc, by Alfred M. Mayer. We reprint the paper this week.

*Fahrbücher für wissenschaftliche Botanik*. Herausgegeben von Dr. N. Pringsheim. Band x. Heft 1. (Leipzig, 1875).—In the first part of the tenth volume of Pringsheim's well-known *Fahrbuch* we have three papers all of very considerable importance. The first is a translation of Count Francesco Castracane's paper on the Diatomaceæ of the Carboniferous period. Ashes of coal from Liverpool yielded, on microscopic examination, several species of Diatomaceæ. The chief forms identified by Count Castracane all belong to fresh-water genera and species, viz. :—

- Fragilaria Harrisonii, Sm.
- Epithemia gibba, Ehrbg.
- Sphenella glacialis, Kz.
- Gomphonema capitatum, Ehrbg.
- Nitzschia curvula, Kz.
- Cymbella Scotica, Sm.
- Synedra vitrea, Kz.
- Diatoma vulgare, Bory.

In addition to these there existed a Grammatophora, a small Coscinodiscus, and probably an Amphipleura (*danica*?). These three marine forms were only observed on one occasion, and their presence must have indicated some accidental inroad of seawater among the vegetation from which the piece of coal was formed. All the fresh-water forms which occurred in the coal are not to be distinguished from the living forms of the same species, a fact of great interest and importance, as it indicates the remarkable permanence of these forms in time; and it is probably an unique instance of the occurrence of species which have remained unmodified through all the lapse of ages which separates the present epoch from the coal period. Count Castracane examined other varieties of coal besides that obtained from near Liverpool, viz., coal from the mines at St. Etienne, another from Newcastle, and a third specimen

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 (6) 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

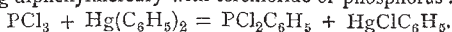
### VIENNA

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-