

G. Krebs (pp. 439 to 448). The author describes experiments, with tiresome fulness of detail, in proof of the fact that the pressure upon water which has been long boiled may be reduced considerably below the maximum tension of aqueous vapour at the temperature of the water, without ebullition taking place; but if, under these circumstances, a further sudden diminution of pressure takes place, or if the water is heated, very rapid or even explosive ebullition is liable to occur.

(4). "Lightning without Thunder," by Prof. Th. Hoh (p. 496). In the night between the 25th and 26th July, the author observed forked lightning unaccompanied by thunder.

The other papers in this number are: "Investigation of Mica and allied minerals," by M. Bauer (pp. 337 to 370); "Studies of the oxygen-compounds of the Halogens," by Hermann Kämmerer (pp. 390 to 417); "Mineralogical Communications" (eighth part), by G. von Rath (pp. 449 to 496).

BOTANY

The Diffusion of Plants

PROF. DELPINO, of Florence, has published some interesting researches on the relation between the diffusion of plants and animals. The life of every plant has three principal objects: its nourishment, its reproduction, and the distribution of its seeds; for each of these three objects special biological conditions being requisite. The fertilisation of many plants can be effected only by some particular animal; as *Arum italicum*, *Aristolochia*, and *Asarum*, by gnats; the fig tribe by different species of *Cynips* (or gall-fly); *Arum dracunculus*, *Stapelia*, and *Rafflesia*, by blue-bottle flies; many others by different kinds of flies or bee-like insects (*Hymenoptera*), and some even by small birds belonging to the family of *Trochilidae*, or humming-birds; *Rosa*, *Paeonia*, and *Magnolia grandiflora*, by beetles of the chafer tribe; others again by small slugs. If in any particular locality the animal necessary for the fertilisation of a particular plant is absent, it is certain that the plant cannot spread; and thus the conditions for the diffusion of plants are dependent on the geographical distribution of animals. A remarkable illustration is furnished by two plants belonging to the same genus, grown in the botanic gardens in Italy, *Lobelia syphilitica* and *L. fulgens*; the flowers of the former are abundantly visited by *Bombris terrestris* and *italicus*, and freely produce seeds; the latter, notwithstanding its beauty and its great store of honey, is never visited by insects in the neighbourhood of Florence, and never bears seeds spontaneously, but can be readily fertilised by artificial impregnation. Prof. Delpino conjectures that it is naturally fertilised by humming-birds. He believes that the scarlet colour of the corolla, so common in the tropics, but comparatively rare with us, is especially attractive to small birds, but offensive rather than otherwise to *Hymenoptera*. As a rule, scarlet flowers are large, bag-like in form, horizontal in position, and with the nectar completely separated, which would of itself perfectly prevent their fertilisation by insects. The largest European flowers, such as the peony and large bird-weed (*Convolvulus sepium*) are fertilised by sphinxes and rose-chafers. [Botanische Zeitung.]

The Victoria Regia

THIS magnificent plant has thriven to an unprecedented degree during the past summer in the Botanic Garden at Ghent. Several leaves have attained a diameter of nine feet, and have supported a weight of 250 lbs., and one even the enormous weight of 500 lbs. Seven of the gigantic leaves completely covered the basin of 164 feet square, and they were obliged to be removed to make room for the young leaves which continued to develop in the centre. Every four or five days a fresh flower appeared, which lasted only two days, or rather two nights, opening in the morning of a perfectly white colour, diffusing about five or six P.M. a very powerful odour of vanilla, closing the next morning at 8 or 9 A.M., opening the same day towards evening, this time of a beautiful carmine, and finally closing the next morning. The magnificent leaves last through the summer; the plant begins to dwindle in October, and dies towards December. About this time the seeds, which have been obtained by artificial fecundation, arrive at maturity. They are sown in January, and appear above the ground in about six weeks. Their infancy is very critical; but once past this period, the young plants grow with astonishing rapidity; the plant in the Ghent Botanic Gardens, unquestionably the finest that has ever been cultivated, arrived at its full development in five months.

CHEMISTRY

Lenz on Electrolytic Iron

THE remarkable results of Graham's experiments on the occlusion of gases have induced Lenz to examine the relation of galvanically-deposited iron to this important function. With the aid of a Sprengel pump and apparatus differing but little from that employed by Graham, he has arrived at the following conclusions. Iron and copper, prepared by the reducing action of a galvanic current, contain gases, hydrogen more especially. The volume of the gas absorbed by iron varies within very wide limits, but may amount to 185 times the bulk of the iron, to the surface of which its presence is principally confined. The gas extricated from such iron, at temperatures under 100°, consists almost solely of hydrogen.

MINERALOGY

Des Cloiseaux on Gadolinite

THIS rare mineral has been studied by different crystallographers with apparently contradictory results. Haiiy, Phillips, Lévy, Scheerer, and Waage have included it in the clinorhombic system; Miller, Nordenskiöld, and Von Lang regard it as orthorhombic. The question could not be definitively settled by angular measurements, inasmuch as the primitive prism is a limiting form, bearing upon the corresponding elements of its anterior and posterior portions modifications whose incidences only differ by a few minutes. The author showed in 1860 that some species of gadolinite are mono-refractive, some bi-refractive, and some are mixtures of those two kinds; but it was not until the summer of last year that he was able to accumulate sufficient material for an exhaustive investigation. It now appears (1) that the Hitteröe crystals measured by Waage and the author, and analysed by Scheerer, have an energetic bi-axial refraction on two optic axes; the orientation of these axes, that of their bisectrix and their inclined dispersion, prove that the primitive form is an oblique rhomboidal prism, whose plane of symmetry is the same as that of the axes: this variety contains 10 to 12 per cent. of glucina. (2) The most homogeneous of the Ytterly crystals, measured by Von Lang and analysed by Berlin, are mono-refractive; they exhibit a certain number of peculiar modifications, in addition to those shown in the Hitteröe crystals, of which they are the pseudomorphs; and they do not contain glucina. (3) The heterogeneous specimens are forms in transition from the first to the second variety; they contain from 2 to 6 per cent. of glucina. These three kinds of gadolinite differ entirely in their symbolic chemical relations. The bi-refractive kind has the formula R_3Si ; the mono-refractive is a sort of peridotite, R_2Si ; and the transition forms give an undecided result, the ratio between the oxygen of the silica and that of the bases varying from 3:4 to 4:5. These differences of constitution probably originate in local circumstances. The Hitteröe mineral seems associated with malacon and polycrase, in a granitic vein composed of quartz, orthose, and oligoclase (with a little mica), and crossing the "gabbro" of which the greater part of the island of Hitteröe is formed: but that of Ytterby is chiefly accompanied by yttrantolite and fergusonite, and imbedded in a red lamellar orthose, divided by large plates of black mica. [Ann. Ch. et Phys. (4) xviii. 305.]

ZOOLOGY

Development of Sacculina

IN a note, published last February, on the development of the egg in those curious crustacean parasites, the *Sacculina*, M. Gerbe stated that the ovules of these animals are formed at first of two transparent vesicles or cells, each furnished with a nucleus and a common membrane; that one of these cells enlarges considerably, and that at the maturity of the ovum, the large cell in which the elements of the vitellus have been developed predominates to such an extent that the smaller one forms only a minute prominence at one pole of the ovum. M. Gerbe compared the large cell to the yolk in the eggs of birds, and regarded the small one as representing the germ or cicatrícula. This homology was also applied by him to the ova of the *Arachnida* and *Myriopoda*.

M. E. van Beneden finds that the ovules are not at first composed of two closely applied cells, but that they form a single cell, formed of a transparent protoplasm, containing a few strongly refractive globules, and of a vesicular nucleus with a nucleolus. With these are observed others of an elongated form,