

## Reviews and Notices.

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### *Professor Groth's New Magazine.\**

WHATEVER expectations may have been formed of the new Crystallographic Journal announced some months ago by Prof. Groth, they have assuredly been realized to the full by the issue of the first number. Before presenting to our readers a digest of its contents, it may be well to note a few general rules that have been laid down at the outset for the guidance alike of contributors and readers. These rules are necessitated by the present want of uniformity in crystallographic notation. Both Miller's and Naumann's symbols are employed, the two being, in most cases, written side by side; but no other system is to be admitted. In referring to the crystallographic axes they are always taken in the order which Weiss originally introduced; that is to say, *a* denotes the axis which runs to and from the observer, commonly taken as the brachydiagonal in the rhombic and the asymmetric system, and the clinodiagonal in the monosymmetric or clinorhombic system; *b* is the axis running right and left, which is generally taken as unity; and *c* is the vertical axis. In dealing with the hexagonal system, for which so many different suggestions have been made, the Editor recommends the adoption of Bravais' proposal to use *four* indices, of which *h*, *k*, *l* refer to the three lateral axes, and *i* to the principal axis. In citing angular measurements, the normals of the angles will be given.

Professor Vom Rath opens the Number with the first of a new series of *Mineralogische Mittheilungen*, being indeed a continuation of the reports which we have been in the habit of looking for in Poggenдорff's *Annalen*. The present series of communications commences with an article on the crystallization of *gold*, referring especially to

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\* Zeitschrift für Krystallographie und Mineralogie, unter Mitwirkung zahlreicher Fachgenossen des In- und Auslandes herausgegeben von P. Groth. Leipzig: W. Engelmann, 1877.

an interesting specimen from Vöröschpatak in Transylvania, already described by Hessenberg. This is a beautifully crystallized plate of gold; the tabular crystals, well seen on the edge of the specimen, being produced by twinning. The twins consist of a combination of cube and octahedron, sometimes with the icositetrahedron 303. The twin-plane is parallel to a face of the octahedron, and the upper and lower sides are also octahedral faces. These normal twins suffer peculiar distortion, as seen in some of the individual elements from the centre of the specimen. The crystals are greatly extended in a direction perpendicular to an edge between the cube and octahedron, or parallel to the diagonal of a face of the octahedron. The rhombic dodecahedron also enters into the composition of these elongated twins. From the primary rod thus formed, two systems of secondary rods shoot out laterally at angles of  $60^\circ$ , and these in turn give off others. Some curiously distorted twins, like little golden knobs, are seated on some of the primary rods. By union of these crystalline elements the forms of the Vöröschpatak gold are produced.

A star-like formation of gold, from Faczebagy, is also described and figured. Each ray is a twin of the pyramidal cube  $\infty 02$ , round a trigonal axis, and elongated in direction of the diagonal of an octahedral face. In explanation of the acicular and capillary forms of gold, some other specimens from Transylvania are described. The elements of this type, which appear to defy the symmetry of the regular system, are generally prisms of rhombic transverse section, and consist of elongated cubes terminated by faces of the pyramidal cube  $\infty 02$ ; the prisms being striated by oscillatory combination of  $\infty 0\infty . \infty 02$ . The twin-plane is, as usual, a face of the octahedron. Among other notable crystals of gold some five-membered forms are described. These are 5-sided needles, sharply terminated with faces of  $\infty 02$ , and either with or without lateral rays.

A curious dendritic specimen of *Speiskobalt* (Smaltite) from the Daniel Mine, near Schneeberg in Saxony, was described by Naumann in 1834. The crystals are twinned according to the law: "Twin-axis a normal to a face of  $30\frac{3}{4}$ ." This specimen has recently been studied by Vom Rath, who finds that, although by far the greater number of the elementary crystals agree with Naumann's description, there are a few little crystals which are twinned according to the law: "Axis of rotation, a trigonal axis." The crystals are a combination of  $\infty 0\infty . 0 . \infty 0 . 202$ ; and are regularly formed, whilst

Naumann's twins are always distorted, and have curved faces. The author proposes an explanation of this distortion and curvature.

Some curious crystals of *Rutile*, scarcely to be called pseudomorphs though having their arrangement evidently determined by the crystalline characters of iron-glance, are also described by Vom Rath. The crystallonomic relations between rutile and iron-glance were first pointed out by Breithaupt. The crystalline combination exhibited by the iron-glance, as indicated by the way in which the crystals of rutile are grouped, is that of the base OR, with the di-hexahedron,  $\frac{1}{3}P2$ . The rutile shews the fundamental pyramid P, the obtuse octahedron  $P\infty$ , the two prisms  $\infty P$  and  $\infty P\infty$ , with several eight-sided pyramids, especially  $\infty P2$ . These crystals were found in the Binnenthal in Switzerland; and descriptions are added of other crystals of rutile, curiously disposed in groups of 8. from Hot Spring, near Magnet Cove, Arkansas.

Prof. Vom Rath's paper is followed by one written jointly by Herr Brögger, of Christiania, and Vom Rath. It describes some large crystals of *Enstatite* found in 1874 by Messrs. Brögger and Reusch in the apatite-mine of Kjørrestad, near Bamle in Norway. Some of the crystals exhibit rhombic symmetry, thus corroborating Des Cloiseaux's determinations based on optical characters, but it is curious that most of them are distorted so as to assume a monoclinic habit. The paper has been presented to the English reader in the *Philosophical Magazine*.

Dr. Schrauf follows with a paper on "The Crystallographic Constants of *Lanarkite*," in which he shews that this species is monoclinic with the angle  $\eta=91^{\circ}49'$ . The ratio of the axes is

$$a : b : c = 0.868113 : 1 : 1.383634.$$

Nine forms have been determined, including some with very high indices. The vertical axis does not coincide with the direction of greatest growth, so that the needle-like crystals are not to be read vertically. The faces which appear to be prismatic belong to a zone of domes, and the free end of the crystal corresponds with the pole of + Y or—Y, not to one of the poles of the Z-axis.

The fourth paper is by Mr. E. S. Dana "On a regular growth of quartz and calcite." The specimens here described were found by the writer in 1875 near "Specimen Mountain" in the Yellowstone Park. Rhombohedrons of calcite ( $-\frac{1}{2}R$ ) are seated on chalcedony,

and the whole encrusted with quartz. Where the quartz covers the chalcedony it is developed irregularly, but where grown on the calcite the crystals assume a determinate position; the pyramidal faces of the quartz, +R or—R, being parallel to the faces of the underlying rhombohedron of calcite. Although the position of the quartz has thus been determined by the calcite, the resulting forms possess a high degree of symmetry, approximating very closely to that which would be produced by twining parallel to 2P2. The English reader will find Mr. Dana's description in the December number of the *American Journal of Science*.

Passing over the two following papers, which relate to the crystalline forms of certain chemical products, we find an article by Dr. Knop, of Karlsruhe, "On the Schorlomite of the Kaiserstuhl." The author describes the method which he employs for the determination of titanitic acid. He concludes that the earlier analyses of titaniferous silicates in general are not trustworthy, on account of the inaccuracy of the analytical methods. The minerals of the Kaiserstuhl that were formerly taken for Schorlamite are either melanite or pyroxene, both of which contain titanitic acid. Schorlomite does not occur there. As the true Schorlomite from America occurs with melanite, and the two minerals are said to assume the same crystalline forms, it is possible that there may have been some mistake about the separation of the species, and that Schorlomite may be amorphous.

In addition to the eight original papers noticed above, the Number contains thirty-two extracts from other Journals, &c., bearing upon Mineralogy and Crystallography. English science comes in for a due share of recognition: the papers in the first two numbers of the *Mineralogical Magazine* are duly noticed, and the proceedings of the Crystallogical Society, which has as yet no Journal of its own, are reported.

The co-operation of eminent mineralogists in almost every part of the world will strengthen Prof. Groth's hands, and help to render his Journal one of no mean value to all who are interested in the progress of Mineralogy from its crystallographic side.

F. W. R.

*Neues Jahrbuch für Mineralogie, Geologie, and Palæontologie.*  
 Founded by K. C. von Leonhard and H. G. Bronn; continued by  
 G. Leonhard and H. B. Geinitz. For the year 1876, parts 1—8,  
 8vo. Koch, Stuttgart.

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NOWHERE is Mineralogy more heartily studied in all its bearings, from chemical rock-study to crystallography, than among our scientific brethren of Germany; and nowhere are the results of their assiduous and enthusiastic work more fully and continuously promulgated than in the long-established *Neues Jahrbuch für Mineralogie, &c.*, of which nine numbers are issued every year. Not only is a large proportion of space in this valuable periodical given to original memoirs on their favourite sciences of Crystallography, Mineralogy, and Petrology, but the Editors receive and publish numerous notes and letters on these subjects; and the current bibliographical lists of the contents of scientific works, from all parts of the world, are unusually rich with allusions to memoirs on these and cognate subjects; and, what is more, a dozen or twenty abstract notices of such books and papers, besides those on Geology and Palæontology, are given in every sequent part of the *N. Jahrbuch*, so that the reader can keep with the stream of progress.

The following are the memoirs more especially relating to Mineralogy in the parts for 1876, now before us.

On the Etch-figures (crystal-forms after corrosive etching) of Lithium-mica, Tourmaline, Topaz, Smithsonite, Adularia, Albite, Fluor, and Rocksalt, with two plates, by H. Baumhauer, in continuation of his examination of Potash-mica and Magnesia-mica.

On the spontaneous and independent activity of crystals, both in disturbed conditions of growth and in the native broken and restored state; by Dr. F. Scharff.

On the occurrence of Lightning-tubes (Fulgurites) in the sand-flats near Starczynow, not far from Olkusz in Poland, with a woodcut; by Ferd. Roemer.

On some Eruptive rocks of the Saxon Erzgebirge, namely:—1 The Syenite of Scharfenstein; 2—The compact Syenite; 3—The

compact Mica-diorite, or Kersantite; 3—The Diabase-porphyr of the Tanneberg Valley, in the Voigtland; 5—The Mica-porphyr of Flöha; by Dr. E. Kalkowsky, of Leipsic.

On a newly discovered vein of Silver-ore in the Troitzk circuit of the Orenburg Government; by W. von Beck.

On the petrography of the Olivine-rocks, Serpentine, and Eclonites of the Saxon Granulite district, with a plate; by Dr. E. Dathe.

Mineralogico-crystallographic Notices (continued from the vol. for 1875), with a plate; by Prof. A. von Lasaulx, 7—Melanophlogite, a new mineral; 8—A new pseudomorph of Calcite after Bitterspar; 9—The Quartz with grooved edges, from Oberstein and Lizzo; 10—Crystals of Red-copper with grooved edges, from Redruth; 11—Aërinite, a new mineral; 12—Pilinite, a new mineral; 13—Supplemental notice of Ardennite.

Studies on Mineral Pseudomorphs and Pseudomorphosis (with a plate and two woodcuts); by F. Eugene Geinitz: 1—Chalcedony on Fluor, France; 2—Chalcedony after Calcite, Schneeberg, Saxony; 3—Hornstone after Calcite, Schneeberg; 4 and 5—Quartz after Fluor, Cornwall, and Rothenberg near Schwarzenberg, Saxony; 6—Semiopal and Quartz after Calcite, Leisnig, Saxony; 7—Chalcedony after Fluor, Trestyan in Siebenbürg; 8—Quartz after Calcite, locality unknown; 9—Gypsum after Rocksalt, Upper Austria; Chalcedony after Datolite, Haytor, Devon; 11—Greenearth and Calcite after Augite, Fassathal, Tyrol; 12, 13, 14, 15—Limonite after Pyrites, Göttingen, Schindelberg, near Osnabrück, &c.; 16 and 17—Malachite and Azurite after Red-copper ore, Chessy, near Lyons; 18 and 19—Aragonite after Gypsum, Mansfeld, Thüringia, &c.; 20—Calcite after Gaylussite, Sangerhausen, Thüringia; 21—Tinstone after Orthoclase, St. Agnes; 22—Parasite? after Boracite; 23—Sanidine after Leucite, Upper Wiesenthal, in the Erzgebirge; 24—Steatite after Quartz, Göpfersgrün, near Wunsiedel; 25—Steatite after Bitterspar, Göpfersgrün; 26—Rocksalt after Carnallite or Sylvine (according to von Zepharovich), Westeregeln, near Stassfurt; 27 Nacrite after Prosopite and ? Topaz, Schalaggenwald, Bohemia; 28—Lithomarge? after Fluor; 29—Nacrite and Fluor after Prosopite, Altenberg in the Erzgebirge; 30—Martite, Pseudomorph? of Iron-oxide after Magnetite, Nova Scotia, &c.

Description of a new Microscope for mineralogical and petrological research, with a plate and woodcuts; by H. Rosenbusch.

On Turnerite, with a plate; by Dr. Ch. O. Trechmann.

On the Nenntmamsdorf Meteor-iron, in the Dresden Museum; by Dr. F. E. Geinitz.

On the occurrence of Serpentine and Olivine-rock in North Norway, with plate; by Karl Pettersen.

On the Twin-growth of the Triclinic Felspars, according to the so-called Pericline-law, and the distinctions founded thereupon, with a plate and two cuts; by Prof. G. vom Rath, Bonn, to whom this study brings full evidence, that the mathematical laws rule with the greatest force in the formation and arrangements of the crystals.

On the temperature in the bore-hole at Sperenberg, and the conclusions derived therefrom, by F. Henrich, who states that the temperature was found to increase steadily with the depth, at the rate of about 0.76 R for every 100 feet.

Chemical researches on the contact-zones and passage rocks of the Steige clayslate and the granitic mass of Barr-Andlau, by H. Unger. The results given are: 1—Both the unaltered and the metamorphosed schists consist of identically the same chemical material; and therefore the change is not produced by either the addition or the removal of any metamorphosing material, but is due to some other still unexplained molecular cause. 2—The andalusite-schists consist of

|                       |               |
|-----------------------|---------------|
| Titanite .. .. .      | 0·7 per cent. |
| Magnetite .. .. .     | 7·2 ,,        |
| Magnesia-mica .. .. . | 32·4 ,,       |
| Andalusite .. .. .    | 24·7 ,,       |
| Quartz .. .. .        | 36·3 ,,       |

3—The granitite, which has broken through the clay-slate, is of a normal character. 4—The potash-felspar in the granitite is a soda-bearing orthoclase. 5—Near-by a lime-soda-felspar occurs. 6—The contact-conditions of the Steige schists are, for the most part, similar to those described by Naumann in the Voigtland, and closely allied to those observed by Fikenscher near Lunzenau, and by Fuchs in the Pyrennees. 7—Lastly, experiments for producing, by re-agents, an artificial alteration of the material of the clayslate, show that it can, by these means, be partly brought to a crystalline condition.

Our reader will also be able to judge of the mineralogical riches of the *Neues Jahrbuch*, when they see that the correspondence includes such names as Kengott, Gümbel, Dana, Frenzel, Weisbach, Pattersen, A. von Lasaulx, Streng, Zirkel, Sandberger, G. vom Rath, Eck, Baumhauer, Strüver, Kloos, and many others. Some of these letters are of considerable length, and have woodcut sketches, and in one instance (vom Rath) a lithographic plate.

To old workers, of course, the *Neues Jahrbuch* is well known; and younger students will find it quite as indispensable as a store-house of facts and philosophy, and as a welcome channel of current thought and discovery.

T. R. J.

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TRIDYMITÉ.—From Prof. C. Doelter's notice to the Imperial Geological Institute of Vienna, November 21, 1876.—This mineral occurs in the Andesite of Gereceses (Transsylvania). The Andesite is compact, hard, and conspicuously schistose; its colour is black, turning grey by the commencement of structural change; aggregations of Felspar are very rare in it. The Tridymite fills very flat cavities, more than  $1\frac{1}{2}$  centimeter in diameter, and of rather rounded outline, between the layers of Andesite. Each hand-specimen shows between 10 and 15 such accumulations, in the form of round, brown or yellow spots. The Crystals of Tridymite are  $\frac{1}{2}$ , at most  $1\frac{1}{2}$ , millimeter in length, generally opaque, reddish brown or yellow (very few honey-yellow), pellucid, and with smooth, measurable planes. Most of them are binary, ternary, or still more complicated, fan-shaped combinations.

Thin slices of the Andesite, not highly magnified, show only a confused accumulation of materials, a vitreous substance prevailing. With higher powers, among the few minerals interspersed in it, the following have been ascertained:—Plagioclase, as hexagonal and lengthened rectangular sections of poly-synthetic crystals; Orthoclase, as the Plagioclase, and nearly of equal frequency; Amphibole or Pyroxene, in lamellæ, scarce; Magnetite, in isolated larger granules. Under a magnifying power of 500—600, the amorphous substance is resolved into short, rectangular, simple crystals of Orthoclase, and probably also Plagioclase, interspersed with longish thin microlites (not determinable), and roundish,



occasionally yellowish microlites (Pyroxene or Amphibole?), also Magnetite, in minute granules or square sections, and a vitreous substance.

The chemical composition of the Gereceses Andesite is:—

|                                |       |
|--------------------------------|-------|
| Silica .. .. .                 | 64·61 |
| Alumina .. .. .                | 15·47 |
| Proto-peroxide of Iron .. .. . | 11·32 |
| Lime .. .. .                   | 4·73  |
| Soda .. .. .                   | 1·82  |
| Potash .. .. .                 | 1·12  |

T. R. J.

HALLOYSITE OF STEINBRUCK, STEYRIA, BY J. GAMPER.—*Imper. Geolog. Institute of Vienna, December 5th, 1876.*—This mineral appears in opaque or somewhat bright fragments, frequently with thin brown veinules of Allophane, in a kaolin-like substance, filling a vein. It is honey-yellow, translucent at the edges, with white streak, and, on the whole, bearing an external resemblance to Schroetterite. It contains traces of organic substances, as it blackens before the blow-pipe, and deposits a coal-like substance when treated with boiling sulphuric acid. The chemical analysis for these minerals is.

|                       | HALLOYSITE. | ALLOPHANE. |
|-----------------------|-------------|------------|
| Silica .. .. .        | 40·7        | 24·2       |
| Alumina .. .. .       | 38·4        | 29·1       |
| Lime .. .. .          | 0·6         | 3·1        |
| Magnesia .. .. .      | 1·5         | traces     |
| Oxide of Iron .. .. . | traces      | traces     |
| Loss by incandescence | 18·0        | 42·9       |

Both these minerals heated with hydrochloric acid deposit pulverulent\* silica.

T. R. J.

THE ACTION OF ORGANIC ACIDS ON MINERALS.—(H. C. BOLTON, *New York Engineering and Mining Journal.*)—Contrary to pre-conceived ideas, based on general notions of the weakness of organic acids, many minerals in fine powder are decomposed by boiling with solutions of citric, tartaric, oxalic, and other organic acids. Not only do all the carbonates examined (fourteen in number) dissolve with effervescence in solutions of the above-named acids,

\* *Qy. gelatinous?* J. H. C.

but many sulphides, silicates, and other classes of minerals are more or less completely decomposed. In many cases the accompanying phenomena, such as evolution of gases, formation of crystalline, precipitates, etc., are characteristic in certain minerals; for example all the specimens of bornite examined yield sulphuretted hydrogen with tartaric acid (also citric and oxalic), while chalcopyrite does not; again, pyrrhotite yields sulphuretted hydrogen under similar circumstances, and pyrite gives no such reaction. Moreover, since citric and tartaric acids decompose potassium nitrate, setting nitric acid free (?), we have a powerful means of attacking sulphides and arsenides which resist the organic acids alone. All the sulphides examined (seventeen in number), with two exceptions, molybdenite and cinnabar, are quickly decomposed by heating with citric or tartaric acid, to which a small quantity of potassium nitrate has been added. Even metallic copper, lead, tin, and silver dissolve in the above mixture of reagents. Potassium chlorate answers very well in place of the nitrate, but the action is slower. Oxalic acid fails to decompose the nitrate or the chlorate of potassium. The action of these acids on the silicates now engages my attention; several of them (natrolite, datolite, wollastonite, calamine, etc.) yield readily to the action of citric acid in solution, gelatinizing as with mineral acids.

Aside from the interest which attends those reactions, there is a manifest advantage in being able to add tartaric (or citric) acid to pocket travelling blowpipe cases; the dry acids are readily transported, and can be dissolved when needed for use. It was during a mineralogical tour last summer that the thought suggested itself of trying the behaviour of minerals with tartaric acid, as a substitute for the mineral acids whose carriage is impracticable.

For microscopic work also the use of these non-volatile acids may be recommended, thus avoiding possible injury to the metallic mountings.

Besides the three organic acids named, I have examined the action of carbonates, at least of malic, formic, and acetic acids, for the sake of comparison; acetic acid gives the least satisfactory results.

So far as I can ascertain, this field has not hitherto been explored. I have ransacked chemical literature for similar studies in vain, and Professor Edward J. Chapman, of Toronto, who is high authority in determinative mineralogy, writes me that while organic acids have

long been used in chemical analysis, their direct application to the examination of minerals is, to the best of his knowledge, entirely novel.

J. H. C.

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CONTRIBUTIONS TO THE KNOWLEDGE OF THE PRIMITIVE ROCKS OF THE NORTH-EASTERN PART OF THE BLACK FOREST; BY CARL HEBENSTREIT, WÜRZBURG, 1877 (*Beiträge zur Kenntniss der Urgesteine des nordöstlichen Schwarzwaldes.*)—This essay contains some useful analyses of rocks and their component minerals. The author has taken great pains to ascertain the exact composition of certain varieties of gneiss, actinolite rock, and granite.

The gneiss from Schapbach is remarkable for containing an orthoclastic felspar with only 2·92 per cent. of potash, whilst there are 9·22 per cent. of soda, and 0·81 of baryta.

C. L. N. F.

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ZIRCON.—ON THE COLOUR OF THE ZIRCON; BY G. SPEZIA, *Atti della Reale Accademia della Scienze di Torino, Vol. xii, 1876.*—The property possessed by the Zircon of losing its colour on being heated, has been attributed by Rivot to the presence of organic matter, which is destroyed at a high temperature. Chandler, on the other hand, supposes that changes of colour are caused by the different degrees of heat to which the mineral has been exposed. Signor Spezia, however, after numerous experiments, has arrived at a different explanation, and he considers that the alteration is due to a difference in the state of oxidation of a colouring metallic oxide.

Amongst other experiments he exposed a zircon to the reducing flame before the blowpipe, and it lost its colour; it regained it when subjected to the oxidizing flame, or when heated in a current of oxygen gas. Chemical analyses show that the zircon contains a little ferric oxide, and the reduction of this to the state of ferrous oxide probably causes the loss of colour; if rich in iron, the zircons do not become quite colourless, but assume a greenish tint.

C. L. N. F.

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LUDLAMITE (F. FIELD; *Phil. Mag., Jan. and Feb. 1877.*)—This is a new hydrated basic ferrous phosphate, which has been found in Cornwall associated with quartz, chalybite, pyrites, mispickel, Vivianite, galena, blende, and fluor. Its H is 3—4; G 3·12; colour

clear green, from pale to dark; transparent; brilliant vitreous lustre. BB on charcoal it tinges the flame slightly green, and yields a semi-fused blackish magnetic residue. In closed tube, gives water on heating—decrepitates violently, and breaks up into brilliant crystalline plates, which are intense bluish-green by transmitted light. Soluble in dilute HCl and  $H_2SO_4$ , is oxidised and dissolved by  $HNO_3$ , perfectly insoluble in glacial acetic acid. Its formula is given as  $7FeO, 2P_2O_5, 9H_2O$  the mean of various analyses being as follows:—

$$\begin{aligned} FeO &= 52.76 \text{ per cent.} \\ P_2O_5 &= 30.11 \text{ ,,} \\ H_2O &= 16.98 \text{ ,,} \\ \hline &99.85 \end{aligned}$$

The mineral is oblique; full details of the crystalline form as determined by Mr. Maskelyne are given, from which we copy the figures of crystals and the stereographic projection given in plate V.

According to Mr. Maskelyne the elements of the crystals are as follows,—

$$101 \cdot 100 = 42^\circ 24\frac{1}{2}'$$

$$111 \cdot 010 = 36^\circ 21'$$

$$101 \cdot 001 = 37^\circ 2\frac{1}{2}'$$

consequently the ratios of the axes are:—

$$a : b : c = 1 : 0.4389 : 0.8932$$

and the inclination of the clinodiagonal on the principal axis is  $79^\circ 27'$ .

There is a very easy and perfect cleavage parallel to the faces  $001 (c)$ , and a much less easy one parallel to the faces of the form  $100 (a)$ . The following faces are also represented in figures 1 to 6, plate V, viz.:—

$$q = 111, q' = 11\bar{1}, m = 110,$$

$$d = 101, k = 201, t = 201,$$

$$l = 011, 2 = 112$$

The following angles between normals to the various faces are selected from Mr. Maskelyne's account of the crystals:—

$$001 \quad \bar{1}11 = c \quad q = 68^\circ 54'$$

$$00\bar{1} \quad \bar{1}11 = c' \quad q =$$

$$\bar{1}11 \quad 11\bar{1} = qq' = 63 \quad 24$$

$$100 \quad 001 = a \quad c = 79 \quad 27$$

$$100 \quad 111 = a \quad q = 107 \quad 48$$

$$100 \quad 110 = am = 65 \quad 55\frac{1}{2}$$

J. H. C.

PILINITE (A. VON LASAULX, *N. Jahrbuch f. Min.*, 1876, 353=368) occurs in cavities with calcite in the granite of Striegau as a felt-like aggregation of extremely fine colorless flexible needles, having the appearance of elongated rhombic prisms with perfect transverse cleavage. Fusible very easily, and with intumescence to a clear glass in a Bunsen flame. In matrass, gives off water. Sp. gr. at 15° C=2.263. Composition as below:—

|                                |   |        |
|--------------------------------|---|--------|
| SiO <sub>2</sub>               | = | 55.70  |
| Al <sub>2</sub> O <sub>3</sub> | } | 18.64  |
| Fe <sub>2</sub> O <sub>3</sub> |   |        |
| CaO                            |   | 19.51  |
| Li <sub>2</sub> O              |   | 1.18   |
| MgO                            | } | traces |
| Na <sub>2</sub> O              |   |        |
| K <sub>2</sub> O               |   |        |
| H <sub>2</sub> O               |   | 4.97   |
|                                |   | 100.00 |

J. H. C.

ROSCOELITE (F. GENTH, *Chem. News xxxiv*, 78-80), occurs in California in dark clove-brown to greenish-brown scales, sometimes in stellate groups having a pearly lustre. Sp. gr=2.938. BR is fusible to a black glass; with micro, gives a dark-yellow bead in OF; and an emerald green bead in RF, and leaves a skeleton of silica. Is only slightly acted upon by acids at ordinary pressure, but if heated in a sealed tube with dilute sulphuric acid to 180° C, it yields a deep bluish-green solution, leaving white pearly scales of silica.

The composition is given as follows:—

|   |       |        |
|---|-------|--------|
| SiO <sub>2</sub>                            | .. .. | 47.69  |
| Al <sub>2</sub> O <sub>3</sub>              | .. .. | 14.10  |
| FeO   | .. .. | 1.67   |
| MgO   | .. .. | 2.00   |
| CaO   | .. .. | trace  |
| Na <sub>2</sub> O (trace Li <sub>2</sub> O) |       | 0.19   |
| K <sub>2</sub> O                            | .. .. | 7.59   |
| V <sub>6</sub> O <sub>11</sub>              | .. .. | 22.02  |
| Loss on ignition                            |       | 4.96   |
| Insol., Gold, &c.                           |       | [0.85] |
|   |       | 100.22 |

J. H. C.

PSITTACINITE (F. GENTH, *Chem. News*, xxxiv, 78-80), occurs at several mines in the Silver Star district, Montana, in very thin mamillary, botryoidal, or pulverulent coatings of a siskin-green to olive-green color. BB fuses readily to a black shining mass, and gives with fluxes reactions for vanadium lead and copper. Soluble in dilute nitric acid, yielding on evaporation a red mass.

The following analyses shew its composition :—

|                                | a.       | b.       | c.       | d.       | e.     |
|--------------------------------|----------|----------|----------|----------|--------|
| PbO                            | 41·36    | 50·17    | 42·89    | 27·12    | 42·38  |
| CaO                            | 14·34    | 16·66    | 14·72    | 9·75     | 15·03  |
| V <sub>2</sub> O <sub>5</sub>  | 14·64    | 19·05    | 15·87    | 9·96     | 15·77  |
| H <sub>2</sub> O               | 7·42     | not det. | not det. | not det. | 7·25   |
| SiO <sub>2</sub>               | 15·13    | } 7·60   | 10·10    | } 4·84   | 15·57  |
| Al <sub>2</sub> O <sub>3</sub> | 1·29     |          | 3·83     |          | } 4·00 |
| Fe <sub>2</sub> O <sub>3</sub> | 2·72     |          | 2·19     |          |        |
| MgO                            | not det. |          | 0·65     |          |        |
| CaO                            | not det. |          | 0·15     |          |        |

J. H. C.

MELINOPHANE.—This mineral is said by E. BERTRAND (*Compt. rend.*, lxxxiii, 71) to belong to the rhombic system and not the tetragonal or hexagonal as hitherto stated.

J. H. C.

LIEVRITE (J. EMERSON REYNOLDS, *Phil. Mag.*, April, 1877).—A fine crystal from Elba, recently analysed by Mr. Wm. Early, yielded the following results :—

|                                |       |           |
|--------------------------------|-------|-----------|
| SiO <sub>2</sub>               | 29·93 | per cent. |
| FeO                            | 31·83 | "         |
| Fe <sub>2</sub> O <sub>3</sub> | 20·16 | "         |
| MnO                            | 3·02  | "         |
| CaO                            | 13·71 | "         |
| MgO                            | ·30   | "         |
| Al <sub>2</sub> O <sub>3</sub> | ·36   | "         |
| K <sub>2</sub> O               | ·20   | "         |
| Na <sub>2</sub> O              | ·29   | "         |
| H <sub>2</sub> O               | ·42   | "         |

100·22

The formula may therefore be given as R<sub>2</sub>O<sub>3</sub>, 6RO, 4SiO<sub>2</sub> where 6RO=4 (Fe, Mn) O + 2 CaO nearly, neglecting the small amount of alkalis, and regarding the water as accidental.

J. H. C.

FRANKLANDITE (J. EMERSON REYNOLDS, *Phil. Mag.*, April, 1877).—This new mineral, from Peru, consists of a felted mass of long thin interlaced fibres, which are white and silky. H not greater than 1; G=1.65. Easily fused, first losing much water. Taste slightly saline, then somewhat alkaline, slightly soluble in water, easily and almost completely dissolved by dilute HCl or HNO<sub>3</sub>. The formula assigned is 2Na<sub>2</sub>O, 2CaO, 6B<sub>2</sub>O<sub>3</sub>, 15H<sub>2</sub>O, the analysis being as follows:—

|                                 | EXPERIMENT. |       |       | THEORY. |
|---------------------------------|-------------|-------|-------|---------|
|                                 | 1           | 2     | 3     |         |
| B <sub>2</sub> O <sub>3</sub> = | 43.76       | 41.81 | —     | 43.61   |
| CaO                             | 12.10       | —     | 11.94 | 11.63   |
| Na <sub>2</sub> O               | 12.37       | —     | —     | 12.87   |
| H <sub>2</sub> O                | 27.92       | —     | 27.66 | 28.04   |
| (NaK) Cl                        | } 3.85      | }     | }     | }       |
| = 2.41                          |             |       |       |         |
| Ca SO <sub>4</sub> +            |             |       |       |         |
| 2aq = 1.44                      | 100.00      |       |       | 96.15   |

The mineral is therefore near to Ulexite

J. H. C.

PEGANITE, FROM ARKANSAS (*Amer. Jour. of Sc.*, ALBERT H. CHESTER). This is shewn to be identical with the *variscite* of Breithaupt, and very near to the *callais* (*callainite*) of Damone.

J. H. C.

HEUBACHITE (*N. Jahr. f. Min.*) is a natural hydrated oxide of cobalt and nickel discovered by Prof. F. Sandberger, at St. Auton.

C. L. N. F.

GRAPHITE (*from the Imper. Geolog. Instit., Vienna, Meeting of Feb. 20, 1877.*)—Mr. J. Szombathy, by microscopical investigation, has recognized in a specimen of Siberian graphite many traces of cellular structure analogous to that of living plants. He infers from this a high probability that graphite had its origin in a vegetable substance.

T. R. J.