Some new minerals from the Binnenthal, Switzerland.

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[Read November 17, 1903, and November 15, 1904.]

HUTCHINSONITE.

A PRELIMINARY notice of this new mineral, named in honour of Dr. Arthur Hutchinson, Demonstrator of Mineralogy in the University of Cambridge, was read before the Cambridge Philosophical Society in October, 1903 [1]. The material was first found, in the white crystalline dolomite of the Lengenbach quarry, during my visit to the Binnenthal in the summer of 1903. More material was received in November of the same year, and a further supply was obtained in 1904 [2].

The characters of hutchinsonite, so far as yet determined, are the following:—

System: orthorhombic. $a:b:c = 0{\cdot}8175 : 1 : 0{\cdot}7549$.
$(100):(110) = 39^\circ\,16'$; $(010):(011) = 52^\circ\,57'$; $(001):(101) = 42^\circ\,43'$.
These elements are calculated from the measured angles

$$(100):(340) = 47^\circ\,28' \text{ and } (100):(101) = 47^\circ\,17'.$$

The usual habit is a flattened rhombic prism [100,010], with numerous small dome- and pyramid-faces. The plane (180) is very common and often very largely developed.

The colour is red to greyish-black, the red being sometimes lighter and sometimes darker in shade. The streak is vermilion. The crystals are transparent to nearly opaque. Hardness, $1\frac{1}{2}$ to 2. Cleavage, parallel to (100), good.

Hutchinsonite usually occurs as very small crystals in the white dolomite, or is closely associated with sartorite and rathite. In the latter case two modes of occurrence may be distinguished: (1) as small, dark red prisms symmetrically arranged on the prism-planes of the sartorite or rathite; (2) as small, stout, light red crystals coating the terminal planes of these minerals.

In the preliminary account, quoted above, it was stated that the new

[1] Proc. Cambridge Phil. Soc., 1904, vol. xii, p. 277. The new mineral is there briefly described, but without name.

[2] Leaving England in December, 1903 for an indefinite period, I handed over the whole of this material, together with the other red minerals—smithite and trechmannite—to the British Museum for the investigation to be completed. A fuller account, by Mr. G. T. Prior and Mr. G. F. Herbert Smith, of these new minerals will therefore appear in a subsequent number of this magazine.

mineral contains arsenic, sulphur, and probably lead; but owing to its very intimate association with sartorite and rathite, and in the absence of any confirmatory tests, this must be considered to be doubtful[1].

The following is a list of the best developed faces; I have also observed a number of other smaller ill-defined planes:—

{100}, {010}, {001}, {850}, {870}, {110}, {780}, {340}, {580}, {120}, {380}, {140}, {180}, {502}, {201}, {302}, {101}, {304}, {102}, {104}, {011}, {322}, {111}, {344}, {122}, {144}.

A selection of the angles measured on hutchinsonite is given below:—

	Calculated.	Measured.	
Zone [100,010].			
(100) : (850) =	27° 3½′	26°56′	
: (870) =	35 34½	35 51	35°49′
: (110) =	39 16	39 20	
: (780) =	43 3	43 4	43 2
: (340) =	47 28	47 25	47 28
: (580) =	52 36	52 39	52 30
: (120) =	58 33	58 36	58 32
: (380) =	65 21½	65 29	65 21
: (140) =	73 0	72 55	73 3
: (180) =	81 21	81 19	81 21
: (010) =	90 0	90 0	
Zone [100,001].			
(100) : (502) =	23 25½	23 35	
: (201) =	28 26	28 24	28 28
: (302) =	35 50	35 45	
: (101) =	47 17	47 17	47 19
: (304) =	55 17	55 32	
: (102) =	65 13	65 15	
: (104) =	77 0	77 1	
: (001) =	90 0	90 0	
Zone [100,011].			
(100) : (322) =	42 7	42 10	
: (111) =	53 36½	53 36	53 37
: (344) =	61 3½	61 4	61 6
: (122) =	69 46	69 50	
: (144) =	79 33½	79 30	

[1] Quite recently, Mr. G. T. Prior has found hutchinsonite to be a sulpharsenite of thallium, lead, silver, and copper: the presence of nearly 20 per cent. of thallium is of especial interest ('Nature,' April 6, 1905, vol. lxxi, p. 534).

Smithite.

System: monoclinic. $a:b:c = 2{\cdot}2309:1:1{\cdot}9657$; $\beta = 78°\ 47\tfrac{1}{2}'$. (100):(101) = 42° 22′; (101):(001) = 36° 25½′; (010):(111) = 37° 3′. These elements are calculated from the angles (100):(101) = 42° 22′, (100):(10$\bar{1}$) = 55° 0′, and (100):(111) = 63° 24′, measured on the best and largest crystal.

The usual habit resembles a flattened hexagonal pyramid with basal plane, the plane (100) being largely developed and combined with the three zones [100,001], [100,111], [100,11$\bar{1}$] equally developed

The colour is light red. Lustre, adamantine. Streak, vermilion. The crystals are transparent to translucent. Hardness, 1½–2. Cleavage, parallel to (100), highly perfect. The surface of the crystals becomes altered on exposure to light, changing from a pure red to an orange-red colour.

Smithite is associated with hutchinsonite, sartorite, and rathite in the white dolomite of the Lengenbach.

Sixteen forms were observed, viz.:—

{100}, {001}, {101}, {10$\bar{1}$}, {411}, {311}, {211}, {322}, {111}, {355}, {011}, {51$\bar{1}$}, {41$\bar{1}$}, {21$\bar{1}$}, {11$\bar{1}$}, {21$\bar{2}$}.

	Calculated.	Measured.	
Zone [100,101].			
(100) : (101) =	42°22′	42°22′	42°24′
: (001) =	78 47½	78 47	78 45
: ($\bar{1}$01) =	125 0	125 0	125 0
Zone [100,011].			
(100) : (411) =	30 0	30 5	30 0
: (311) =	37 7	37 7	37 9
: (211) =	47 43	47 45	47 42
: (322) =	54 50	54 49	
: (111) =	63 24	63 24	
: (355) =	71 25	71 23	
: (011) =	84 50	85 0	
($\bar{1}$00) : ($\bar{5}$11) =	27 1½	27 4	
: ($\bar{4}$11) =	32 49½	32 11	
: ($\bar{2}$11) =	53 52½	53 53	
: ($\bar{1}$11) =	72 16	72 11	
: ($\bar{2}$12) =	83 27½	83 48	
: (011) =	95 10	94 57	

I have named this mineral after Mr. G. F. Herbert Smith, M.A., Assistant in the Mineral Department of the British Museum [1].

TRECHMANNITE.

After the discovery of the two red minerals described above, I received from Dr. C. O. Trechmann a specimen with a few minute red crystals resting on a crystal of baumhauerite in a cavity in the white dolomite. It was necessary to remove the crystals from the matrix for examination, and it was found that in symmetry they differed from both hutchinsonite and smithite. I therefore distinguish this third red mineral by the name trechmannite, after Dr. Charles O. Trechmann, who for many years has worked at the minerals of the Binnenthal. Dr. Trechmann's specimen was taken from the Lengenbach quarry in the summer of 1902; a second specimen, with a single crystal of trechmannite resting on a crystal of tennantite was found in 1904.

The following characters have been determined:—

System: rhombohedral. $(111):(100) = 37° 7\frac{1}{2}'$. $a:c = 1:0{\cdot}6556$.

The element was calculated from $(1\bar{1}0):(100) = 58° 29'$ observed on two crystals.

The two crystals which were measured consist of portions of hexagonal prisms with some small pyramidal and rhombohedral faces. One crystal exhibits a cleavage perpendicular to the prism.

In colour, streak, and hardness it resembles hutchinsonite and smithite.

The following is a list of forms observed:—

$o\{111\}$, $r\{100\}$, $x\{21\bar{2}\}$, $z\{31\bar{3}\}$, $a\{1\bar{1}0\}$, $b\{2\bar{1}\bar{1}\}$, $d\{52\bar{7}\}$, $f\{32\bar{5}\}$.

There are also a number of narrow planes lying in the zone $[10\bar{1},010]$.

	Calculated.	Measured.		Calculated.	Measured.
$(10\bar{1}):(52\bar{7})$	= 16° 6′	16°17′	$(10\bar{1}):(100)$	= 58°29′	58°29′
$(10\bar{1}):(32\bar{5})$	= 23 25	23 23	$(100):(001)$	= 63 2	63 1
$(10\bar{1}):(11\bar{2})$	= 30 0	29 57	$(01\bar{1}):(21\bar{2})$	= 47 25	47 25
$(10\bar{1}):(01\bar{1})$	= 60 0	60 0	$(1\bar{1}0):(21\bar{2})$	= 76 57	77 1
$(10\bar{1}):(31\bar{3})$	= 17 41	17 43	$(21\bar{2}):(11\bar{2})$	= 26 6	26 12
$(10\bar{1}):(21\bar{2})$	= 25 33½	25 34	$(10\bar{1}):(111)$	= 90 0	90 0
$(10\bar{1}):(010)$	= 90 0	89 55	$(\bar{1}10):(111)$	= 90 0	90 0
$(\bar{1}01):(\bar{2}12)$	= 25 33½	25 30			

[1] Since the above was written an analysis of smithite has been made by Mr. G. T. Prior, the results of which lead to the formula $AgAsS_2$.

Marrite.

The crystals of this new mineral are highly modified and are usually doubly terminated. They are tarnished with red, yellow, and blue colours, and on this account might, at first sight, be mistaken for tennantite ('binnite') or iron-pyrites. The only specimen, which up to the present time has been found, was taken from the Lengenbach quarry in July, 1904. On the matrix of white crystalline dolomite there are about fifteen small crystals, averaging 2–3 mm. across, of marrite deposited on or about tarnished crystals of lengenbachite (p. 78) and iron-pyrites. Three crystals were removed from the matrix; two being measured with the results given below, and the third, after goniometric verification, being used for determining the streak and hardness of the mineral. The specific gravity and chemical composition of the crystals could not be determined without sacrificing the unique specimen.

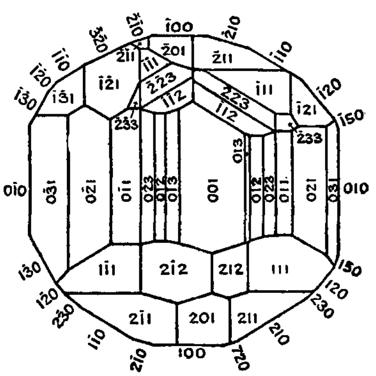

Fig. 1.—Orthographic projection of marrite.

The system of crystallization is monoclinic, with the elements:—

$$a:b:c = 0{\cdot}57634:1:0{\cdot}47389;$$
$$\beta = 88^\circ\,45',$$

as calculated from the measured angles (100): (001) = 88° 45', (010):(110) = 60° 3', and (010):(011) = 64° 39'. The common habit of the crystals resembles a cube modified by $\{hk0\}$ and $\{hkl\}$ planes (fig. 1). The crystals are aggregated together in such a manner as to suggest the presence of twinning about the plane (001).

The colour of marrite is lead-grey to steel-grey, but the crystals are usually tarnished with iridescent colours. The lustre is metallic and brilliant. The streak is black with a slight tinge of chocolate-colour. The mineral is opaque. No cleavage was observed; the fracture is conchoidal. Hardness, 3.

The name marrite is proposed in honour of Dr. John Edward Marr, F.R.S., of Cambridge.

LIST OF (FORTY) FORMS OBSERVED ON MARRITE.

Symbol.	Indices.	Size of face.	Character of reflection.	Symbol.	Indices.	Size of face.	Character of reflection.
a	{100}	Large	Sharp	$\frac{7}{3}k$	{073}	Narrow	Fair
b	{010}	,,	,,	$2k$	{021}	Large	Good
c	{001}	,,	,,	k	{011}	Fair	Good
$-2h$	{201}	Fair size	Fair	$\frac{2}{3}k$	{023}	Narrow	Fair
$-h$	{101}	Very small	Poor	$\frac{1}{2}k$	{012}	Large	Sharp
$+2h$	$\{20\bar{1}\}$	Fair size	Sharp	$\frac{1}{3}k$	{013}	Narrow	Fair
$+h$	$\{10\bar{1}\}$	Very small	Poor	$\frac{1}{5}k$	{015}	,,	,,
$7r$	{170}	Narrow	Broad	$-2q$	{121}	Very small	Faint
$6r$	{160}	,,	,,	$-p$	{111}	Fair	Good
$5r$	{150}	,,	Fair	$-2t$	{212}	Small	Fair
$4r$	{140}	Fair size	Good	$-2u$	{211}	,,	,,
$3r$	{130}	Narrow	Fair	$+3v$	$\{13\bar{1}\}$	,,	,,
$2r$	{120}	Large	Sharp	$+2q$	$\{12\bar{1}\}$	,,	,,
$\frac{3}{2}r$	{230}	Fair size	Fair	$+p$	$\{11\bar{1}\}$	Fair	Good
r	{110}	Large	Sharp	$+2p$	$\{11\bar{2}\}$	Small	Fair
$\frac{3}{2}s$	{320}	Narrow	Fair	$+2t$	$\{21\bar{2}\}$	Fair	Good
$2s$	{210}	,,	,,	$+2u$	$\{21\bar{1}\}$	,,	,,
$\frac{7}{2}s$	{720}	,,	,,	$+z$	$\{23\bar{3}\}$	Small	Fair
$\frac{7}{2}k$	{072}	,,	Good	$+x$	$\{22\bar{3}\}$	,,	,,
$3k$	{031}	Large	Sharp	$+y$	$\{23\bar{1}\}$	,,	,,

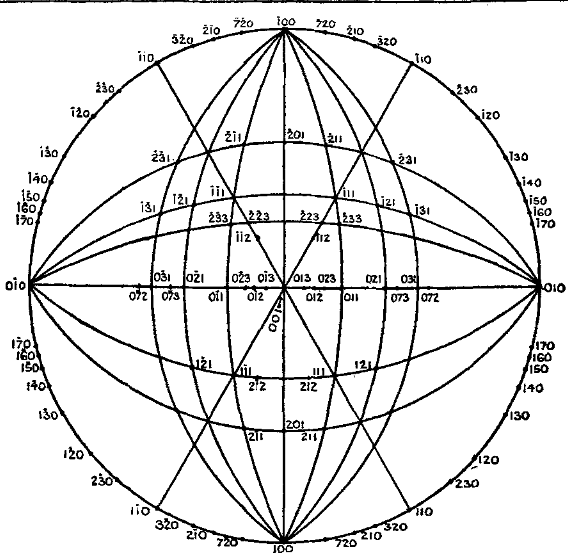

FIG. 2.—Stereographic projection of marrite.

Calculated and Measured Angles of Marrite.

	Calculated.	Measured. I.	Measured. II.
Zone [100,001].	° ′	° ′	° ′
(100) : (201)	30 58	30 56	30 59
: (101)	49 50	—	—
: (001)	88 45	88 45	88 45
(100) : (20$\bar{1}$)	31 38	31 38	31 38
: (10$\bar{1}$)	51 19	—	—
: (00$\bar{1}$)	91 15	91 15	91 15
Zone [010,001].			
(010) : (072)	31 5½	31 7	31 8
: (031)	35 8	35 8	35 8
: (073)	42 8	42 15	—
: (021)	46 32½	46 32	46 32
: (011)	64 39	64 40	64 39
: (023)	72 28½	72 29	—
: (012)	76 40½	76 39	76 40
: (013)	81 1½	81 5	—
: (015)	84 35	—	84 30
: (001)	90 0	90 0	90 0
Zone [010,100].			
(010) : (170)	13 55½	14 0	—
: (160)	16 8	16 5	—
: (150)	19 8½	19 6	19 0
: (140)	23 27	23 28	23 30
: (130)	30 3	30 1	—
: (120)	40 57	40 57	41 0
: (230)	49 6	49 6	49 0
: (110)	60 3	60 3	60 3
: (320)	68 59	69 0	69 1
: (210)	73 55½	73 56	73 58
: (720)	80 39½	—	80 42
: (100)	90 0	90 0	90 0
Zone [010,201].			
(010) : (211)	76 43	76 17	—
: (201)	90 0	90 0	—
Zone [010,101].			
(010 : (121)	54 5½	54 3	—
: (111)	70 6	70 6	70 5
: (212)	79 44½	79 44	79 43
: (101)	90 0	—	90 0

	Calculated.	Measured. I.	Measured. II.
Zone [010,20$\bar{3}$].	° ′	° ′	° ′
(010) : (23$\bar{3}$)	67 42	67 24	67 30
: (22$\bar{3}$)	74 19	74 19	—
Zone [010,10$\bar{1}$].			
(010) : (13$\bar{1}$)	42 1	42 0	—
: (12$\bar{1}$)	53 30	53 33	53 31
: (11$\bar{1}$)	69 42	69 44	69 43
: (21$\bar{2}$)	79 31	79 40	79 35
Zone [010,20$\bar{1}$]			
(010) : (23$\bar{1}$)	53 21	53 23	—
: (21$\bar{1}$)	76 3	76 4	76 10
: (20$\bar{1}$)	90 0	90 0	90 0
Zone [100,011].			
(100) : (211)	33 27	33 33	33 32
: (111)	52 42	52 37	52 38
: (011)	88 53	88 45	88 53
(100) : (21$\bar{1}$)	34 17½	34 17	34 14
: (11$\bar{1}$)	54 7	54 5	54 3
: (01$\bar{1}$)	91 7	91 15	91 4
Zone [001,110].			
(001) : (111)	42 59½	43 2	43 2
: (110)	88 54½	88 58	88 58
(001) : ($\bar{1}$12)	25 35	—	25 47
: ($\bar{2}$23)	32 38	32 48	32 38
: ($\bar{1}$11)	44 1	44 2	44 1
: ($\bar{1}$10)	91 5½	91 3	91 4
Zone [001,120].			
(001) : (121)	50 56	50 54	—
: (120)	89 10	89 14	89 11
(001) : ($\bar{1}$21)	51 57	51 58	51 56
: ($\bar{1}$20)	90 50	90 46	90 49
Zone [001,210].			
(001) : (212)	40 2	40 6	40 4
: (211)	58 48	58 55	58 45
: (210)	88 48	88 43	88 50
(001) : ($\bar{2}$12)	41 4	40 37	41 0
: ($\bar{2}$11)	60 40	60 25	60 39
:($\bar{2}$10)	91 12	91 7	91 10

Lengenbachite.

This new mineral occurs in thin blade-shaped crystals, sometimes very thin and curled up like paper; they exhibit a highly perfect cleavage, with splendent lustre, parallel to the large face. One crystal measured 40 mm. in length and 5 mm. in breadth. The common habit is an irregular interlacing of thin plates striated parallel to their length, but frequently I have noticed the union of two or more plates parallel to the cleavage-plane at an angle approximating closely to 60°, on one or both sides of the long edge of the plate; also a less common aggregation is one similarly arranged, but making an angle approximating closely to 90°. This twinning (?) about a plane at 45° to the long edges of the crystals is also to be seen in sartorite, rathite, and baumhauerite, crystals of which sometimes cross one another at right angles. A third aggregation is that of two long prisms twinned and combined together about a plane bevelling the edge of the long side of the prism; the reflection from the two cleavage planes of the twinned parts is very good, and the angle measured was 28° 37′.

Some of the crystals exhibit a number of fine striae, which traverse the cleavage-planes and bevelled edges at an angle, on the cleavage-plane, of about 58° with the long edge of the plate; such crystals might easily be mistaken for thin crystals of jordanite.

Various crystal fragments were measured to endeavour to discover the crystallographic system. From the best crystal I obtained in the prism-zone, [CM], the angles $CM = 92° 30′$ and $CN = 25° 18′$; for a zone of faces terminating the crystal the angles $Ch = 70° 7′$, $Cg = 81° 32′$, $Cl = 106° 32′$, and $Cm = 121° 0′$; and for other terminal faces not falling into any zone the angles $Cd = 91° 40′$, $Cf = 94° 8′$, $Ca = 60° 4′$. In the prism-zone of another crystal the angles to the cleavage C were 85° 12′, 91° 31′, 96° 33′, 98° 6′, and 117° 10′; and in the prism-zones of other crystals 43° 0′ and 53° 35′, 51° 7′ and 57° 12′. The re-entrant angle, $C\underline{C}$, in the prism-zone of a twinned crystal was 28° 37′. As I have been unable to perceive any plane or axis of symmetry present in the crystal fragments measured, I conclude that the system of lengenbachite is anorthic.

I had hoped that the very thin plates, though opaque to light, might have proved transparent to radiant heat [1], and so help to determine the symmetry, but Dr. A. Hutchinson tells me that he finds that they are absolutely opaque to heat-rays.

The plates are flexible, but not elastic; they are somewhat malleable, make a mark on paper, and are difficult to pulverize. The crystals do not fly asunder when heated, as do the other sulpharsenites of lead from the Binnenthal. The specific gravity of 1·3700 gram. of picked plates was found to be 5·80. Lustre, metallic; colour, steel-grey, often with an iridescent tarnish. Opaque. Streak, black, with a chocolate tinge.

A preliminary chemical examination, kindly made by Dr. A. Hutchinson, proves the mineral to be essentially a sulpharsenite of lead with small amounts of silver, copper, and antimony.

[1] See Hutchinson, Min. Mag., 1903, vol. xiii, p. 342.

For the new mineral described above I propose the name lengenbachite [1], after the Lengenbach, a tributary stream in the Binnenthal, which flows through the dolomite quarry where the crystals were discovered in July, 1904.

BOWMANITE.

System: rhombohedral. (111) : (100) = 53° 50′. $a : c = 1 : 1{\cdot}1847$. This element was calculated from (100) : (010) = 88° 43½′, measured on a crystal giving very sharp reflections; another crystal with fairly sharp reflections gave (100) : (111) = 53° 50′.

Forms observed: $o\{111\}$, $r\{100\}$, $f\{\bar{1}11\}$. The common habit is a rosette-like aggregation of a number of thin plates with curved surfaces: the individual crystals are usually six-sided plates parallel to {111}, and are bounded at the edges by narrow faces of {100} and $\{\bar{1}11\}$. Sometimes the crystals resemble octahedra, {111} and {100} being equally developed: the faces of the form $\{\bar{1}11\}$ are always small, and deeply striated parallel to their intersections with (111).

Colour, honey-yellow. Lustre, brilliant, and vitreous to resinous in character. Streak, white. There is a perfect cleavage parallel to (111)[2]. Hardness, 4½. Specific gravity, 3·2. Transparent; optically uniaxial and positive. Occurs on and among crystals of dolomite in the Lengenbach quarry.

The name bowmanite I have given to this new mineral in honour of Mr. Herbert Lister Bowman, M.A., Demonstrator in Mineralogy in the University of Oxford.

The above description is based on a few small crystals obtained in the summer of 1904; but I have, during the last three years, collected a few small rounded honey-yellow crystals, the faces of which were too irregular and curved to admit of accurate measurement.

The small amount of available material has been handed over to Mr. Bowman for examination. He reports that in some of its characters the new mineral resembles hamlinite, from which, however, it differs

[1] A note on lengenbachite, marrite, and bowmanite was read at the Cambridge meeting of the British Association in August, 1904, and these names were first published in 'Nature' on December 1, 1904 (vol. lxxi, p. 118).

Amongst a series of Binnenthal minerals exhibited at a meeting of the Vienna Mineralogical Society on November 7, 1904, were specimens of a new and undescribed species to which the name jentschite was applied. So far as can be judged from the brief description of the exhibits, as reported in Tschermak's Mitteilungen (1904, vol. xxiii, p. 551), jentschite would appear to be identical with the mineral described above under the name lengenbachite. In the same place brief mention is also made of some new minerals under the names hutchinsonite and trechmannite.

[2] Not (100), as stated in 'Nature,' 1904, vol. lxxi, p. 118.

in composition, being essentially a phosphate of lime and alumina, with small amounts of iron, water, and possibly magnesia.

He finds, further, that the crystals are pseudosymmetric, and show, through thin plates cleaved parallel to the basal plane, a division into six biaxial sectors, in which the acute bisectrix is normal to the surface, the axial plane nearly at right angles to the adjacent edge of the hexagonal plate, and the birefringence positive and rather strong. The axial angle varies, in some cases reaching a value $2E = 50°$, while some of the crystals are uniformly uniaxial, without sectors.

It is hoped that more material will soon be found, so that the composition and characters of the mineral may be more completely determined.

APPENDIX.

Blende with metallic lustre, from the Binnenthal.

These highly modified and twinned crystals of tetrahedral habit were found in 1904 in the slate-coloured dolomite of the Lengenbach quarry. They are especially interesting on account of the very thin and highly brilliant, metallic [1], lead-grey coating by which they are enveloped; this surface film becomes dull when exposed to the light, and disappears rapidly in the presence of hydrochloric acid. The crystals might easily be mistaken for galena or tennantite.

According to Becke [2], the largely developed octant of the Lengenbach blende is $\{1\bar{1}1\}$, and this orientation of the crystals is here adopted. With the exception of a small tetrahedral face (111), all the forms on these crystals lie in the negative octants.

The following table of calculated and measured angles between the faces of the three crystals (I, II, III) contains five new forms marked *.

	Calculated.	Measured. I.	II.	III.
(100) : $(6\bar{1}1)$*	13°16′	13°14′	13°16′	—
: $(4\bar{1}1)$	19 28	19 26	—	—
: $(2\bar{1}1)$	35 16	35 16	35 16	35°16′
: $(7\bar{4}4)$	38 56½	—	39 0	—
: (11.7.7)*	41 59	41 59	42 0	41 58
: $(7\bar{5}5)$*	45 17	45 14	—	45 17
: $(13.\bar{10}.10)$*	47 24½	—	—	47 17
: $(5\bar{4}4)$*	48 31½	48 28	48 30	—
: $(1\bar{1}1)$	54 44	54 44	54 44	54 44
: (110)	90 0	—	90 0	—

[1] Crystals of blende with metallic lustre have been described by Professor Miers, Min. Mag., 1899, vol. xii, p. 111. [2] Min. petr. Mitt. (Tschermak), 1883, vol. v, p. 507.

SELIGMANNITE [1].

In October, 1904, some comparatively large (measuring $2{\cdot}5 \times 2 \times 1$ mm.) black, much twinned crystals of this very rare mineral were found. They are deposited on large crystals of dufrenoysite, and also on baumhauerite. Mingled with the seligmannite, and partially coating the baumhauerite, are a number of very fine needles of a lead-grey colour, the nature of which I have as yet been unable to determine.

Montreux Club,
Territet, Switzerland.

[1] Cf. Min. Mag., 1903, vol. xiii, p. 336.