On Monazite from Cornwall, and Connellite.

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Monazite from Cornwall.

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A SPECIMEN of crystallised quartz and albite has recently been acquired for the British Museum which has a few isolated crystals of this rare mineral dispersed upon it. Conclusive evidence that the specimen comes from Cornwall is supplied both by the appearance of the quartz and albite and by the presence of the clay-slate with which they are associated.

The mineral monazite or Turnerite has hitherto been discovered in few localities and never in the British Isles. Anatase, however, is mentioned in Greg and Lettsom (*Manual of the Mineralogy of Great Britain and Ireland*, p. 363) as occurring at Tintagel and near Liskeard in Cornwall; and it is just possible that crystals of monazite may have been mistaken for anatase. Even if anatase has been found, it may be observed that the presence of one of these minerals is a ground for suspecting that the other may possibly occur in the same locality, as has been remarked by Hessenberg. Sphene, for which monazite might also have been mistaken, is not recorded from Cornwall; the specimen here described was detected by Mr. Davies as a new Cornish mineral, but was supposed to be sphene.

The crystals of monazite are approximately rectangular tables of the form shown in fig. 1, of a yellowish-brown colour. They are mostly from 1 to 2 mm. in length and breadth, and from $\frac{1}{2}$ to 1 mm. in thickness, and are thinly dispersed on one side of the specimen upon crystals of albite which overlie the quartz. In one instance, however, monazite is actually included in a crystal of quartz.

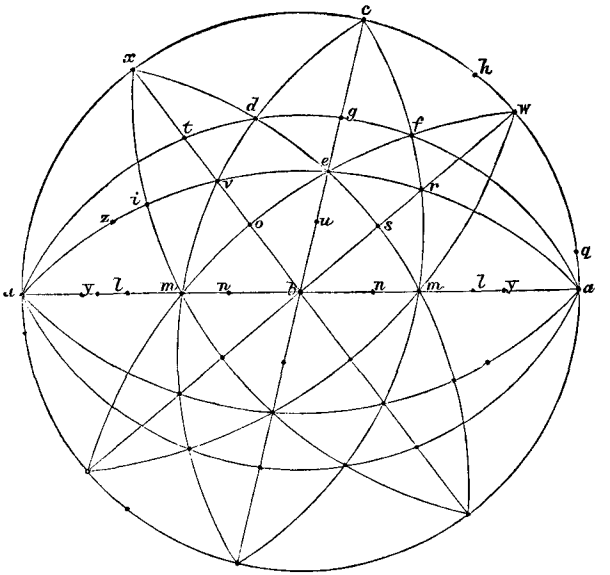
The following is a complete list of the forms which have been found upon Turnerite or monazite, including two new faces observed for the first time upon these Cornish crystals. A projection is given in fig. 1. (See p. 166.)

In addition to the well-determined faces given in this table, Phillips found two faces between *am* and *bm* respectively, and E. Dana, *American Journ. Scien.* xxiv. 1882, p. 247, found three between *sv*, *sv'* (121 : 11$\bar{1}$), and *re* respectively, to which definite indices cannot be assigned.

			I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	
a	100	$\infty P \infty$	*p*	*P*	*P*	*M*	*a*	*c*	*p*	*a*	*c*	
b	010	$\infty \breve{P} \infty$	g_1	*K*	*K*	*P*	*b*	*b*	g_1	*b*	*b*	
c	001	0 P					*c*			*c*		
e	011	$\breve{P} \infty$	*m*	*M*	*M*	*e*	*e*	*m*	e_1	*e*	*m*	
u	021	$2 \breve{P} \infty$	g_3	*l*			*u*	*l*	g_3	*u*	*l*	
g	012	$\frac{1}{2} \breve{P} \infty$	h_3	*i*				*i*	h_3	*g*	*i*	
w	101	$-\breve{P} \infty$	o_1	*a*	*a*	e^1	*w*	*u*	o_1	*w*	*u*	
x	$\breve{1}01$	$\breve{P} \infty$	a_1	*c*	*c*		*x*	*x*	a_1	*x*	*x*	
h	305	$-\frac{3}{5}\breve{P} \infty$										Trechmann, Neues Jahrb. 1876, p. 593.
m	110	∞P	e_1	e_3	*e*	*e*	*m*	*e*	*m*	*M*	*e*	
l	210	$\infty \breve{P} 2$	e_2	e_1		*a*		*v*	e_2	*l*	*v*	
y	310	$\infty \breve{P} 3$								*y*	*n*	
n	120	$\infty \breve{P} 2$		e_5		*e*	*n*			*n*	*o*	
r	111	$-P$		*f*		*a'*	*r*		$d\frac{1}{2}$	*r*	*z*	
s	121	$-2\breve{P} 2$				*o'*	*s*			*s*		ω of E. S. Dana.
v	$\breve{1}11$	$\breve{P}$	$b\frac{1}{2}$	g_1			*v*	*r*	$b\frac{1}{2}$	*v*	*r*	
i	$\breve{2}11$	$2 \breve{P} 2$							b_1	*i*	*t*	
z	$\breve{3}11$	$3 \breve{P} 3$	$b\frac{3}{2}$					*s*	$b\frac{3}{2}$	*z*	*s*	
o	$\breve{1}21$	$2 \breve{P} 2$	e_3	e_6				*w*	*w*	*o*	*w*	
d	$\breve{1}12$	$\frac{1}{2} P$								*d*		
t	$\breve{2}12$	$\breve{P} 2$								*t*		
f	112	$-\frac{1}{2} P$										
q	701	$-7\breve{P} \infty$										

I. Lévy. Annals of Philosophy, xxi. 1823, p. 241.
II. Phillips. Mineralogy. 3rd Edition, 1823, p. 382.
III. Brooke. Philosophical Magazine, x. 1831, p. 189.
IV. J. D. Dana. American Journal of Science, xxxiii. 1838, p. 70.
V. Miller. Phillips' Mineralogy, 1852, p. 493. (Monazite.)
VI. Miller. Phillips' Mineralogy, 1852, p. 653. (Turnerite.)
VII. Descloizeaux. Manuel de Minéralogie, i. 1862, p. 533.
VIII. Kokscharow. Materialien zur Mineralogie Russlands, iv. 1862, p. 8.
XI. Vom Rath. Poggendorff's Annalen, cxix. 1863, p. 247.

FIG. 1



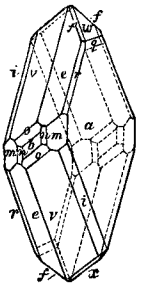


FIG. 2.

Fig. 2 shows a combination of all the forms found upon the Cornish crystals. The faces *f* and *q* are new. *f* is a small, well-defined face between *w e*; *q* a rounded face between *a w*.

	Calculated.		Observed.	
	°	′	°	′
w f	24	38½	24	36
w q	31	14½	31	48 approx.

With the exception of *b*, *o*, *m*, *w*, the faces are somewhat uneven, and do not give good reflections. The measured angles agree closely with those of Kokscharow. The following are some of the best:—

			Kokscharow.	
	°	′	°	′
b m	46	39	46	41½
b o	34	4	33	55
o m	35	58	35	58
w m	55	27	55	43
w x	93	0	93	1
b v	53	4	53	22

The measurements, however, though sufficient for the identification of the forms, are not good enough for the accurate determination of elements.

A crystal often has projecting from the faces, *v*, *e*, &c. corners of small crystals, which are united with itself by twinning upon the face *a*.

Connellite.

Several very fine specimens of this rare and beautiful Cornish mineral from Marke Valley and Camborne have lately been added to the British Museum Collection.

In comparison with what has formerly been found the crystals on the specimens from the latter locality are gigantic, some attaining a length of 2 to 4 mm., and having the terminal faces as much as 1 mm. in breadth.

The crystals are lustrous, and appear of a deeper blue than is common, owing to their greater thickness. They are closely united in radiating groups so as to form botryoidal and rounded masses. Isolated needles when they occur are small.

The matrix of the specimens is cuprite, with which are associated malachite and chrysocolla, the former occurring both massive and well crystallised. Chalcophyllite also appears on the Marke Valley, Brochantite and Chessylite on the Camborne specimens. Measurements made upon these crystals do not differ appreciably from those made upon minute needles by Prof. Maskelyne in 1863 (*Phil. Mag.* xxv. p. 39), and the habit of the crystals is that shown in Fig. 2, Plate II. of his description, but generally with the addition of the prism *b* $\{2\bar{1}\bar{1}\}$ ∞P truncating the edges of *a* $\{10\bar{1}\}$ ∞P2.

The scalenohedral faces *o w* $\{9\bar{4}\bar{2}, 46\bar{7}\}$ are not to be found upon these crystals, although they seem to be so characteristic of the little needles previously described.

But one specimen is remarkable for a totally distinct habit of crystallisation. The Connellite here occurs in stout prisms *a b*, capped by the basal plane alone; the latter, however, is rounded and uneven, showing a tendency to form faces which are slightly inclined to the true basal plane. On this specimen, as in the case of the others, the crystals are mostly grouped so as to form rounded masses, but also occur isolated, and of the same habit.

One crystal has been found showing a combination of the prisms, hexagonal pyramid, and basal plane.