

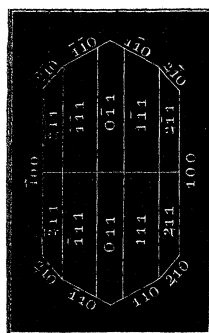
II. "On the forms of some Compounds of Thallium." By W. H. MILLER, M.A., For. Sec. R.S., Professor of Mineralogy in the University of Cambridge. Received December 13, 1865.

Nitrate of Thallium.

Prismatic, $010, 011 = 38^\circ 8'1$; $100, 110 = 62^\circ 56'3$.

| | |
|------------------------------|---------|
| 100, 011 | 90° 0' |
| 100, 110 | 62 56·3 |
| 100, 210 | 44 23 |
| 100, 111 | 68 6·5 |
| 100, 211 | 51 13 |
| 110, 111 | 34 57·5 |
| 011, 0 $\bar{1}1$ | 103 44 |
| 011, 211 | 38 47 |
| 110, $\bar{1}10$ | 54 7·4 |
| 210, 211 | 28 46 |
| 210, $\bar{2}10$ | 91 14 |
| 011, 111 | 21 53·5 |
| 111, $\bar{1}11$ | 43 47 |
| 111, $\bar{1}\bar{1}1$ | 93 44·8 |
| 111, $\bar{1}\bar{1}\bar{1}$ | 110 5 |
| 211, $\bar{2}11$ | 77 34 |
| 211, $2\bar{1}1$ | 75 38 |
| 211, $2\bar{1}\bar{1}$ | 122 28 |

Fig. 1.



Observed combinations:— $100, 111$; $100, 111, 211$; $100, 011, 111, 211$; $100, 110, 210, 111, 211$; $100, 011, 110, 210, 111, 211$.

No cleavage observable.

From the observed minimum deviation of the brightest part of the solar spectrum formed by refraction through the faces $100, \bar{1}10$, it appears that the index of refraction of a ray in the plane 001 , and polarized in that plane, is about 1·817. The refrangibility of the other ray is greater, its minimum deviation through the same faces being 93° nearly.

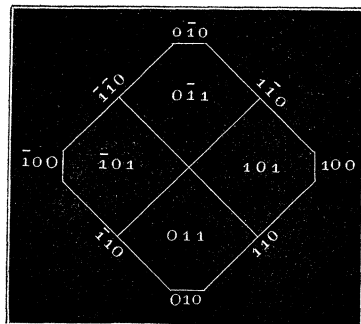
Sulphocyanide of Thallium.

Pyramidal, $001, 101 = 38^\circ 20'3$.

Observed forms:— $100, 110, 101$.

Fig. 2.

| | |
|------------------|------------------|
| $100, 010$ | $90^\circ 0'$ |
| $100, 110$ | $45^\circ 0'$ |
| $100, 011$ | $90^\circ 0'$ |
| $100, 101$ | $51^\circ 39.7'$ |
| $110, 101$ | $63^\circ 59'$ |
| $101, \bar{1}01$ | $76^\circ 40.6'$ |
| $101, 011$ | $52^\circ 2'$ |



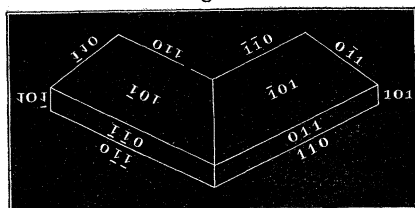
Observed combinations :— $110, 101$; $100, 110, 101$.

The crystals are remarkable for the very unequal extension of the faces of the same simple form, and at first sight look as if they belonged to the oblique system. The breadth and thickness of one of the largest crystals were 1.1 and 0.055 millimetre respectively; and of two adjacent faces of the form 101 , one was about eleven times the breadth of the other. The distribution of the large and small faces did not appear to be subject to any law; so that these crystals cannot be regarded as combinations of large and small hemihedral forms.

Twins. Twin face 101 .

| | |
|------------------------|------------------|
| $101, \bar{1}01$ | $180^\circ 0'$ |
| $110, 011$ | $52^\circ 4'$ |
| $\bar{1}\bar{1}0, 011$ | $-52^\circ 4'$ |
| $011, 110$ | $75^\circ 56'$ |
| $011, \bar{1}\bar{1}0$ | $75^\circ 56'$ |
| $\bar{1}01, 101$ | $26^\circ 38.8'$ |

Fig. 3.



No cleavage observable.

An attempt was made to determine the optical constants of the crystal by observing the minimum deviation of light refracted through a face of the form 110 and one of the opposite faces of the form 100 ; the latter were, however, so small that the observation could not be made with much accuracy. It appeared that for the ordinary ray polarized in a plane parallel to the line 001 , the indices of refraction of red light, of the brightest part of the spectrum, and of violet light were about 2.115 , 2.159 , and 2.314 respectively, and that, for the extraordinary ray polarized in the plane 001 , the indices of refraction of red light, the brightest part of the spectrum, and of violet light were about 1.890 , 1.973 , and 2.143 respectively.

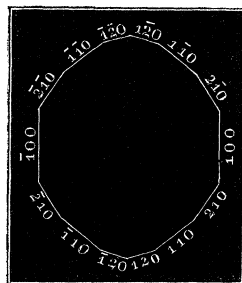
Carbonate of Thallium.

The faces which have been observed are all in one zone, and exhibit a symmetry which is compatible with either the prismatic or the oblique system. The crystals probably belong to the prismatic system. They are aggregated in such a manner as to render it very difficult to isolate a single crystal, or to determine the faces which belong to the different individuals of a group of crystals.

Observed forms :— $1\ 0\ 0$, $1\ 1\ 0$, $2\ 1\ 0$, $1\ 2\ 0$.

Fig. 4.

| | |
|-----------------------------|-----------------|
| $1\ 0\ 0$, $1\ 1\ 0$ | $51^\circ\ 28'$ |
| $1\ 0\ 0$, $2\ 1\ 0$ | $32\ 7$ |
| $1\ 0\ 0$, $1\ 2\ 0$ | $68\ 57$ |
| $1\ 1\ 0$, $\bar{1}\ 1\ 0$ | $77\ 4$ |



Twins. Twin face $1\ 1\ 0$. One individual is generally united to each of two others, in this respect resembling the twins of cerussite, aragonite, glaserite, and chrysoberyl.

A cleavage has been observed probably parallel to the faces of the form $1\ 1\ 0$; it may, however, be parallel to the faces of the form $1\ 0\ 0$, the complexity of the twin crystals being such that it could not be ascertained whether the cleavages observed belonged to one crystal or to two different crystals.

I am indebted to Mr. Crookes, the discoverer of thallium, for the crystals of nitrate, sulphocyanide, and carbonate of thallium, above described.

Fig. 1.

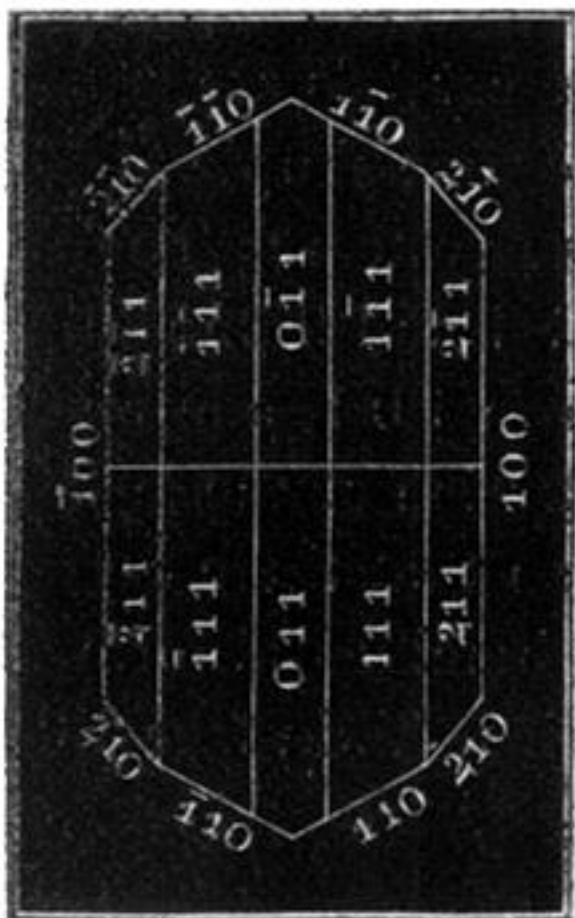


Fig. 2.

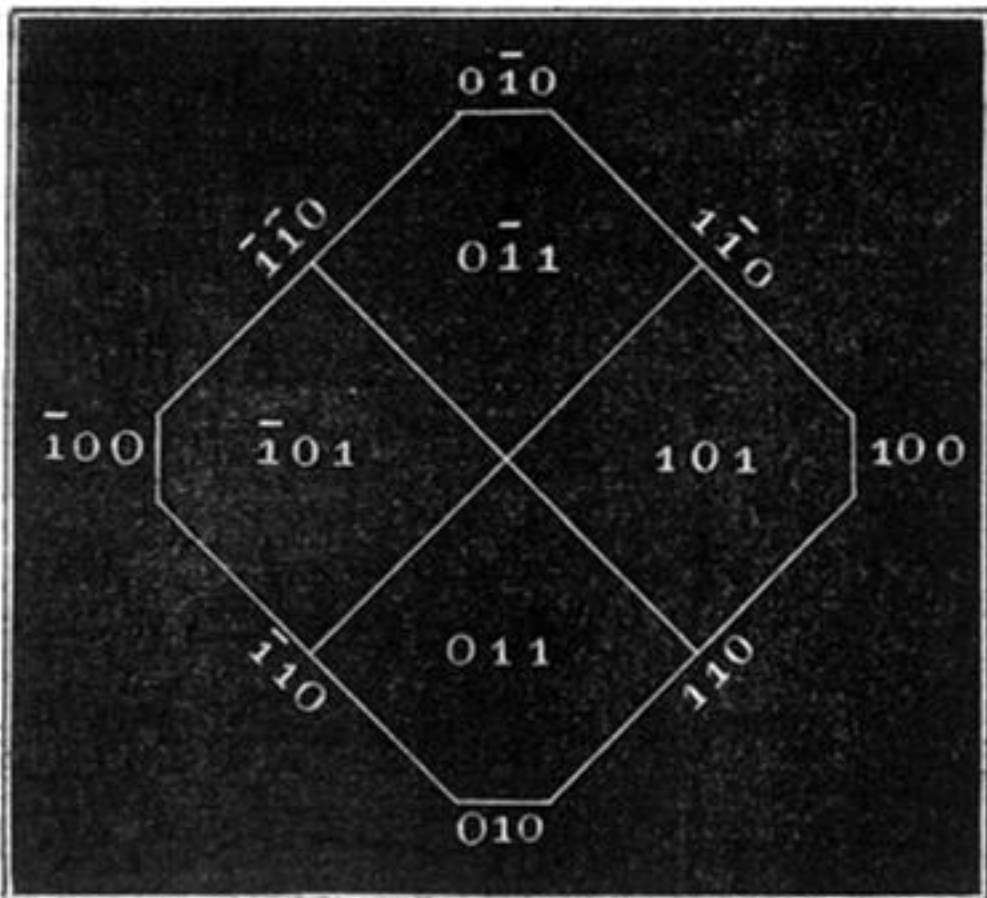


Fig. 3.



Fig. 4.

