Orthoclase from Kilima-njaro, and Adularia from Switzerland.

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Orthoclase from Kilima-njaro.

PROFESSOR BONNEY has described, in the British Association Report for 1885, the rock specimens brought from Kilima-njaro by Mr. H. Johnston, and has called attention to the peculiar form of the felspar crystals which are porphyritically developed in a rock referred by him to augite-andesite. It is at his suggestion that a more detailed account of these crystals is here attempted.

They are of a brown to yellowish-brown colour, full of cavities, and considerably weathered, and are so much rounded that it is impossible to determine their nature with certainty by means of the hand goniometer. They sometimes attain a length of 35 mm.

Two distinct habits of the crystals are shown in figures 1 and 2. In the former the angle *mm* was roughly measured as lying between 53° and 57° (in one case 61°), while the inclination of *y* to the edge *mm* is about

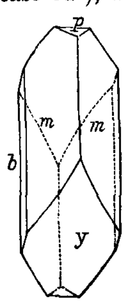

Fig. 1.

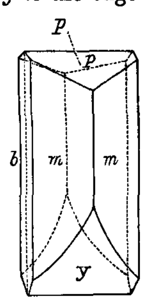

Fig. 2.

35°. *p* is generally found only as a cleavage face, and there is also a ready cleavage parallel to *b*. The form shown in fig. 2 is evidently a twin growth, for the cleavage surface is here repeated at the back of the crystal, which is now symmetrical about a plane truncating the edge *mm*. In this case the angle between the two cleavage faces *pp′* can be measured with some accuracy by the reflecting goniometer, and is found to be 52°20′.

If then the crystals are orthoclase they appear to be a combination of the forms $m = \infty P\{110\}$, $y = +2P\infty\{20\bar{1}\}$, $b = \infty P\infty\ \{010\}$, and sometimes $p = oP\{001\}$, twinned on the orthopinakoid (100), that is to say according to the Carlsbad law, but distinguished by this peculiarity—that the individuals are united, not by irregular penetration or along the clinopinakoid, but along the orthopinakoid; in other words the plane of twinning is also the plane of junction.

To make sure that this is so sections were cut across one of the twin crystals in two directions, parallel to the cleavage planes p and b.

In the basal section the *twin junction* is seen to run across the crystal in an uneven line perpendicular to b, while the directions of extinction in the two halves are nearly the same, namely, parallel and perpendicular to b. The other section shows the two individuals clearly defined; the directions of extinction in each are nearly parallel and perpendicular to p (inclined at 5° to p), and are therefore inclined to one another at angles of 42°20′ in the two halves of the section. The usual appearance of the twin crystals is shown in fig. 3, one individual thinning off rapidly towards the prism edge.

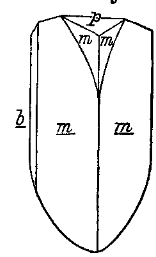

Fig. 3.

Finally, a section cut perpendicular to the cleavage p and examined in the polariscope, shows both optic axes symmetrically disposed about a plane parallel to b, their apparent angle in air being nearly 102° (sodium light).

In other words, the plane of the optic axes nearly coincides with the basal plane p, $2E = 102°$, and the first mean line is parallel to the plane of symmetry b.

There remains no doubt, therefore, that the crystals are orthoclase of most unusual habit, twinned according to the Carlsbad law, but united in such a way that the plane of twinning is also the face of composition.

It may be added that the sections show the crystals to be full of enclosures; but especially characteristic are small parallelepipedal spots of which the sides are parallel to the faces $p\ b\ y$. These may be cavities filled with decomposition products. Parts of the crystals viewed by polarised light exhibit a well-defined cross-hatching parallel to the pinakoid faces.

It has been pointed out to me by Mr. Teall that this orthoclase is similar to the felspar of the "rhomben-porphyr" from Christiania. The resemblance is very close, both as regards the habit and the mode of twinning (see *Mügge. Neues Jahrb. 1881* (II.), p. 107).

Adularia from Switzerland.

A crystal of adularia picked out from among some Swiss minerals by

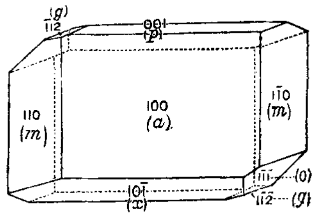

FIG. 4.

Mr. Davies because of its remarkable habit, is worthy of description. The form of the crystal is shown in fig. 4.

It is tabular owing to the large development of the orthopinakoid faces $a = \infty\bar{P}\infty$ $\{100\}$. The forms $m = \infty P \{110\}$, $p = oP \{001\}$, and $x = +\bar{P}\infty$ $\{\bar{1}01\}$ are symmetrically developed, but $o = +P\{\bar{1}11\}$ and $g = +\frac{1}{2}P\{\bar{1}12\}$ appear only on two opposite corners, giving the crystal a very asymmetrical aspect.

Both *a* and *g* are rare faces. *a* occurs on orthoclase from Striegau, Hirschberg, Elba, and Schiltach, and on adularia from Pfitschthal and Zillerthal. As a large face giving a tabular habit it has been described by F. Klocke (*Berichte der naturforschenden Gesellschaft zu Freiburg*, 1876, vi. Heft 4, p. 17), on orthoclase from Schiltach in the Black Forest. *g* was described by Weiss as interesting because apparently inconsistent with the symmetry of the system, since with his parameters it would have a horizontal edge with *b*, and would be equally inclined to the *m* faces. (In reality *gm* is 83°8′ on one side and 81°12′ on the other.) The face was established for the first time by Hessenberg in 1863 (*Min. Not.* v. p. 12) on adularia from St. Gothard.

On the crystal fig. 4 all the faces are fairly smooth and bright with the exception of *a*, which is unevenly striated parallel to its intersections with *m* and *p*, and is rounded towards the *m* faces.