it seems to us that, in view of the relatively small atomic shifts involved, the possibility of a structural transformation on cooling from 720° C. to room temperature is by no means ruled out.

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A note on celsian.

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X-ray work on the Ba-felspar celsian ($BaSi_2Al_2O_8$) by Taylor, Darbyshire & Strunz (1934) determined the values $a = 8{\cdot}63$, $b = 13{\cdot}10$, $c = 7{\cdot}29$ Å, $\beta = 116°$ (approx.) for the dimensions of a monoclinic cell; they also showed that celsian had the same tetrahedral framework structure as other felspars. Several celsian specimens from different localities have been examined by the author and it is found that the cell described by Taylor *et al.* is only a pseudo-cell. In the true cell the length of the c axis is doubled, for weak reflexions are observed midway between the main layer lines on c-axis oscillation photographs. If these weak reflexions are indexed on the basis of the true cell dimensions, their indices are all of the type $(h+k)$ odd, l odd. The strong reflexions on the main layer lines all have $(h+k)$ even, l even; thus the cell is body-centred. These new observations are particularly interesting since they confirm the expected close structural similarity between the Ba-rich members of the K–Ba felspar series and the Ca-rich members of the plagioclases.

The plagioclase series has been investigated in some detail, and suggestions concerning the structural arrangements of the Ca-rich members have been put forward (Gay & Taylor, 1953; Gay, 1954); these are used in the following discussion. The diffraction patterns of celsian (apart from changes in intensity, and some small dimensional changes) are very similar to those of body-centred anorthite. In body-centred anorthite the Si–Al distribution within the tetrahedra of the framework is thought to be ordered; the 14 Å c axis, denoted by a particular class of weak reflexions, is characteristic of this ordering. In the same way, the Si–Al arrangement in celsian is thought to be ordered since the c axis is doubled. In celsian, the reflexions resulting from this doubling are, on the whole, very much weaker (5–10 times) than the corresponding reflexions in anorthite-type structures. This may be in part due to enhancement of reflexions on the main layer lines by the presence of the heavy Ba ions and also to the small but significant differences between the atomic positions in celsian and anorthite. There is also the possibility that the Si–Al ordering is not complete for the particular specimens examined. Some anorthite-rich plagioclases show additional weak reflexions which do not obey the body-centring condition; the character of these reflexions may vary from sharp to very diffuse. These 'primitive' reflexions are dependent on the Ca ions, and the reversible changes in character which they exhibit may be associated with movement of the Ca ions within their interstices in the structure. No traces of similar reflexions have been found for the celsians examined; it might be expected that the larger size of the Ba ions would prevent their occurrence.

Although the main features of the celsian diffraction patterns are in accord with those expected in the light of current views of felspar structures, it should be pointed out that the specimens so far examined contain appreciable amounts (possibly as much as 10%) of potash felspar. Whether this affects the degree of Si–Al order (and consequently the intensities of the weak subsidiary reflexions) and the possible occurrence of additional weak primitive reflexions, such as are found in the plagioclases, can only be determined by an examination of a very pure barium felspar. Further work on this and on other members of the K–Ba felspar series is being carried out.

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