drinking glass will crack if doused with cold water does not depend greatly upon the content of crystalline material in the glass. The development of cracks in materials by thermal shock is more a matter of temperature gradients, coefficients of thermal expansion, internal strains, and strengths of materials. Incidently, glass or bone china are not strictly homogeneous structures. For example, bone china may be comprised of about 50 percent of crystalline material and 50 percent of amorphous. Ordinary glass frequently contains some 0.1 to 1.0 percent of crystalline material.

Contrary to Kamrin's statement, we did not equate the smashing action of a weight to the normal biting action experienced by teeth. Our purpose, as is abundantly clear from the communication, was to find a test, of whatever character, that would distinguish between teeth bearing high or low levels of strains and cracks.

His comments on the statistics of caries incidence in various locations of the mouth are interesting and we agree that this type of information will help us in properly assessing the problem; provided one takes into account such factors as our normal tendency to flip bites of hot food from the front teeth to between the molars with the tongue.

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Isomerization of β-Carotene with Sunlight

Zechmeister and his associates have studied the isomerization of β-carotene by various methods, including fusion, refluxing its solution, use of iodine catalysis, shaking its solution with hydrochloric acid, and insolation (exposure to sunshine in the absence of catalyst) (*1, 2*). They obtained, by insolation, besides 98-percent recovery of all-*trans* β-carotene, 1 percent each of neo-β-carotene-U and neo-β-carotene-B (*2*).

In my work (*3*), in addition to neo-β-carotene-U and neo-β-carotene-B, the formation of neo-β-carotene-E was confirmed. A solution of chromatographically pure β-carotene (16 mg) in hexane (150 ml) was placed in a Pyrex measuring flask irradiated with direct noontime sunlight for 1.5 hr, and then chromatographed on lime-Celite (2:1). The appearance of the developed chromatogram is described in Table 1.

Table 1. Appearance of developed chromatogram. The numbers in parentheses in column 3 are the light absorption maxima in millimicrons used to characterize the zone materials.

Zone width (mm)	Zone color	Zone identification
2	Orange	Irreversible layer (heterogeneous)
15	Almost colorless	
25	Reddish orange	Neo-β-carotene-U (480, 450)
5	Almost colorless	
62	Dark orange	β-Carotene (486, 454)
28	Dark yellow	Neo-β-carotene-B (476, 444)
2	Almost colorless	
12	Pale reddish	Neo-β-carotene-E (480, 447)

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References and Notes

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3. I wish to thank L. Zechmeister for his kind advice.

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Note on the Al and Si Positions in Ordered Na and K Feldspars

The condition of disorder among the Al and Si positions in Na and K feldspars is well known, and the degree of disorder is measurable (*1*). To date, x-ray analysis has not been successful in determining the Si and Al positions in the ordered minerals. However, it is theoretically possible to predict the structural positions of Al and Si in the ordered mineral and to substantiate the prediction by observations of certain features that are described here.

The ordered or lowest energy level for the mineral would be expressed on the atomic level by having the highest polarizing power cations (Si) form the largest number of bonds with the most polarizable anions (bonded to Al). This condition would be realized if one-third of the Si cations shared two of their four anions with two Al cations and shared the other two anions with two other Si cations; two-thirds of the Si cations would share anions with one Al cation and three Si cations. This association results in polymerized Si—O—Si—O—Si—O—Si—O chains alternating with (but bonded to) chains of Si—O—Al—O—Si—O—Al—O that pass through the feldspar so as to produce periodically uniform bond conditions. "Partially disordered" feldspars could have the same cation associations, but the periodic uniformity would be lacking. Disordered feldspars could have some Si cations sharing anions with three Al cations and other Si cations sharing anions with four Si cations. One Al sharing an anion with another Al is unlikely, as is evidenced by the lack of Al-Si disorder in anorthite (*2*).

If the orientation of the chains in the mineral could be determined, the ordered configuration of the Na and K feldspars would be known. Three possibilities are present: the chains may parallel either the *a*, the *b*, or the *c* crystallographic axis. Chains parallel to the *c*-axis are such that two Al, Si positions per unit cell are not included in the chains. These two positions are included if the chains spiral along their length, but such chains would not occur because this results in some improbable bond combinations, such as