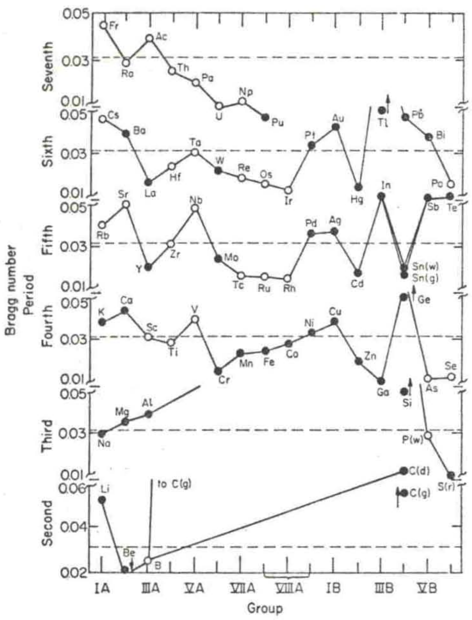

FIG. 27. The Bragg number of all of the elements considered in this review with the exception of the rare-earth metals. The horizontal dashed line represents the mean value. Open points are estimated values.

and thus agreed equally well with $\mathcal{B}$. It is felt that L' is more characteristic of the element than L, primarily because L depends on the validity of Richard's rule. For this reason L' rather than L was used in calculating the size factor (see Section 29).

The variation of the Bragg number with the group is shown in Fig. 27, and again a group dependence is noted: $\mathcal{B}$ is high for the alkali and alkaline-earth metals, group VA metals, nickel and its cogeners, and group IB metals; and low for the group IIIA, IVA, VIA, VIIA metals, iron and cobalt and their cogeners, and group IIB metals. Since $L \simeq L' \simeq \mathcal{B}$ the plots for L and L' are not shown, but in general they are quite similar.

The modified Leibfried and Bragg numbers for the rare earths are shown in Fig. 28. In general both L' and $\mathcal{B}$ decrease with increasing atomic number. The anomalies at europium and ytterbium are undoubtedly

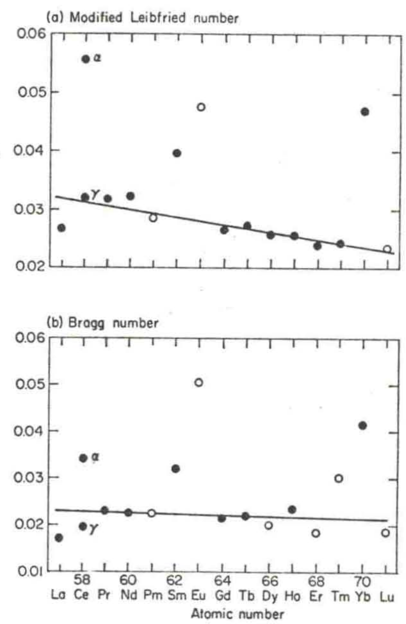

FIG. 28. (a) The modified Leibfried number of the rare-earth metals. (b) The Bragg number of the rare-earth metals. Open points are estimated data.

due to the divalent nature of these elements.[13] The value for α-cerium is included only for comparative purposes and is not expected to lie near the straight line established for the normal trivalent rare earths. The anomalous behavior of lanthanum and samarium is not understood, but seems to follow the tendency of these two metals to deviate from the trend established by the other rare earths for some of the other properties (Figs. 2 and 25).

Estimated Data. The values considered to be estimated in Table XXII are those for which at least one quantity used in calculating L, L', or $\mathcal{B}$ was estimated. In general the shear modulus, μ, was the quantity which was least known experimentally for the elements. If the melting point or the atomic volume was an estimated value for a given element, the shear modulus was also an estimated quantity. For the Bragg number considerable experimental data concerning the heats of fusion were lacking.