supervised parts of the work, and I profited greatly from discussions with them; Professor Weiss and Professor C. Durrell offered valuable criticism during the preparation of the manuscript. I am indebted to Dr. P. C. Gilmour for an introduction to the techniques of fabric analysis of carbonate rocks.

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PRINCIPLES AND TERMINOLOGY

Fabric Axes

Several systems of notation have been suggested for fabric axes (Cloos, 1946, pp. 5–6), but the one proposed by Sander is now almost universally adopted by structural petrologists. Because at least some of the controversy in structural problems stems from a lack of uniformity in the use of symbols denoting the fabric axes (a, b, B, c), their meaning is here discussed.

Sander (1930) defined the fabric axes a, b, and c for fabrics with monoclinic symmetry as follows: ab is the principal fabric plane; ac is the plane of symmetry in the fabric; and c is normal to ab. Around any flexual slip fold with monoclinic symmetry (fig. 2, a) the orientation of a and c varies, while b, which is the axis of symmetry, retains a constant orientation; b is the *principal fabric axis* and is generally designated B. Weiss (1955, pp. 229–230) has discussed the significance of these terms and has distinguished *fabric axes,* which are descriptive and are defined in terms of the geometric relations of the elements in a fabric, from *kinematic axes,* which are defined in terms of a movement system: "The kinematic axes are defined for rotational strain involving slip on one *s*-plane. The slip-plane is ab, the deformation plane is ac, and the normal to the plane of deformation is b." The notation B is adopted in the present study to denote the principal kinematic axis and also the principal fabric axis.

This definition of fabric axes, it must be noted, holds only for fabrics with monoclinic symmetry and cannot be transferred arbitrarily to fabrics with another order of symmetry. Sander extends the use of the term "B-axis" to fabrics with triclinic and orthorhombic symmetry. He relates the orientation of all the fabric elements in tectonics to "*s*-planes" (a descriptive term signifying any type of planar structure in a rock). Described in terms of these fabric planes, the B-axis in monoclinic fabrics is the axis of intersection of two or more *s*-planes—$s_1, s_2, s_3 = (h0l)$ (Sander, 1948, p. 81, Case III). In fabrics with orthorhombic symmetry (*ibid.*, Case II), one or more pairs of equivalent *s*-planes—s_1 and s_2, or s^a_1 and s^a_2, s^b_1 and $s_b = (h0l)$—intersect in an axis which Sander calls B, by analogy with the fabrics with monoclinic symmetry. Sander refers to Cases II and III as "Orthorhombic B-tectonites" and "Monoclinic B-tectonites," respectively, and states that the latter is the commonest type of tectonite. Another important type of symmetry in natural rock fabrics is exhibited by the "B-tectonites of the Second Order" (*ibid.*, Case IV). In these rocks *s*-planes intersect in each of two mutually perpendicular axes, which Sander designates B and B'. Where both B and B' have the characteristics of the B-axis in orthorhombic B-tectonites (Case

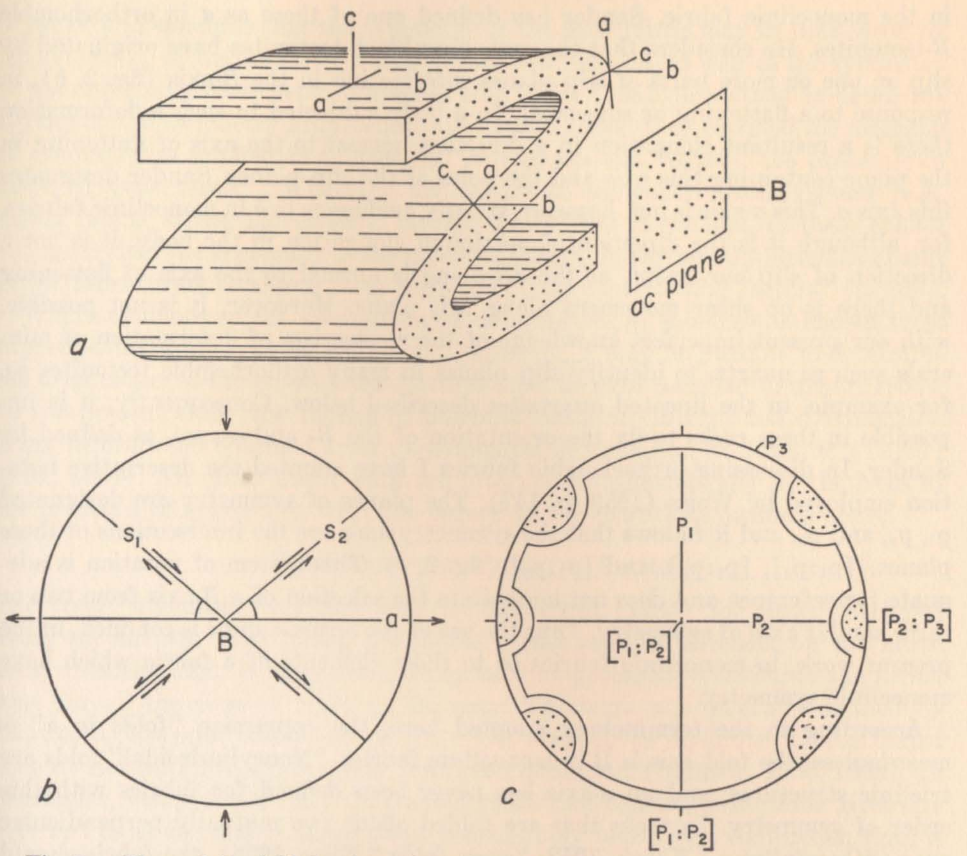

Fig. 2. *a*. Flexural slip fold showing orientation of fabric axes. *b*. Diagram illustrating fabric axes in orthorhombic fabrics, after Sander (1930). S_1 and S_2 are equivalent slip planes; arrows indicate axes of flattening and extension. *c*. Reference coördinates used in the present study for orthorhombic fabrics; p_1, p_2, and p_3 are planes of symmetry in a projection showing the statistical orientation of a hypothetical fabric element.

II), the over-all symmetry of the fabric is orthorhombic, or very rarely tetragonal or isometric. Where B has the properties of a B-axis in an orthorhombic B-tectonite, and B', of a B-axis in a monoclinic B-tectonite, the symmetry of fabric is monoclinic. In the final instance, where both B and B' have the characters of monoclinic B-axes, the resultant symmetry is triclinic. Sander describes rocks with fabrics of these three types respectively as orthorhombic, monoclinic, and triclinic $B \perp B'$ tectonites, and considers B and B' to be syngenetic in such rocks. There is a further group of triclinic tectonics in which two mutually oblique B-axes are recognizable (the $B \wedge B'$ tectonites). This group, according to Sander, has not the same significance as those described above, as he believes that the B- and B'-axes are not syngenetic, but have been produced by the superposition of two unrelated deformations.

In fabrics with orthorhombic symmetry there are at least two, and usually three, mutually perpendicular planes of symmetry and, consequently, two or three symmetry axes which have the same "symmetrological" significance as B