circle on the sphere is also a circle on the stereogram. This permits the representation of any plane to be constructed easily. The geometric centers of the great circle arcs may be found graphically (Fig. 11.3*a*), or from the relationship:

$$d = r \tan \delta \qquad (11.1)$$

where d is the distance from O to the center, r is the radius of the primitive, and δ is the dip angle. Fig. 11.3*a* shows a family of meridional great circles representing a series of planes striking due north and inclined to the west at intervals of 10°. Once constructed, a full net of these curves permits the direct plotting of any structural plane.

Planes not passing through the center of the sphere cut the surface as small circles. A second and closely related property of the stereographic projection is that these small circles also plot as circular arcs. These too can be found graphically (Fig. 11.3*b*), or from

$$d = r/\cos a \qquad (11.2)$$

where, as before, d is the distance from O to the center, r is the radius of the primitive, and a is the angle the small circle makes with a point on the primitive. Thus a family of curves representing a series of such planes can be added to the net (Fig. 11.3*b*).

The result, in its full form, is the Meridional Stereographic or Wulff Net, or more simply the *stereonet*, in which the two families of curves are drawn every 2° (Fig. 11.4; see p. X-11 for a full-scaled version). The use of this net is a great aid in graphic constructions. Problems are solved by simple manipulation of data which are plotted directly. In short, the net is a portable computer on which many practical problems can be solved quickly, including a number which would be far more taxing by any other manual means. Once the technique is learned, greatest benefit is gained if a net is permanently available. This is easily accomplished if the printed form is mounted on a rigid backing and its surface protected with a clear plastic sheet (see suggested materials, p. viii). In use, data are plotted and problems solved on an overlay sheet of tracing paper. This overlay is affixed to the net by a map pin placed exactly at the center which allows the sheet to revolve freely. A small piece of clear plastic tape on the back side of the tracing sheet to reinforce the pin hole will prevent tearing or enlarging of the point of rotation.

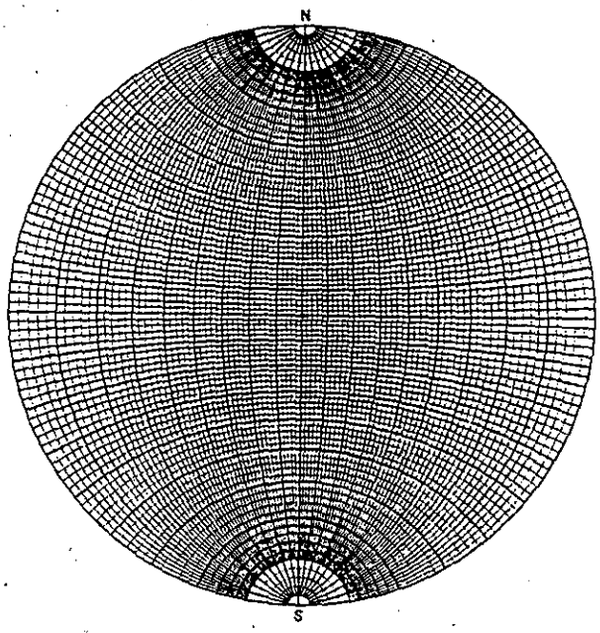

FIGURE 11.4 The Meridional Stereographic or Wulff Net.

TECHNIQUES OF PLOTTING

When using the stereonet, it is important to visualize the net as if you are looking into a hemispheric bowl, and to imagine that the circular arcs are inscribed on its inner surface. Illustrations such as Fig. 11.1*b* and 11.2*a* may help in achieving this mental picture. Then the various structural elements to be plotted can be visualized as passing through the center of the sphere and intersecting its surface. *The importance of this visualization can not be overemphasized.* Not only does it make the plotting easier, but it serves as an important check on the proper location, and on the general correctness of the various manipulations. For example, there are four different positions which satisfy the numerical components of dip and strike, but three of these are incorrect. Visualization will quickly show which of these is the correct one. The following examples should be worked through