TRANSACTIONS OF THE AMERICAN INSTITUTE OF MINING ENGINEERS
[SUBJECT TO REVISION]

Dip Chart

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THE writer has observed that some confusion is experienced by many mining engineers in making vertical sections of ore deposits in mining properties which they have examined. Having much examination work calling for the correct interpretation of vein structure and the subsequent

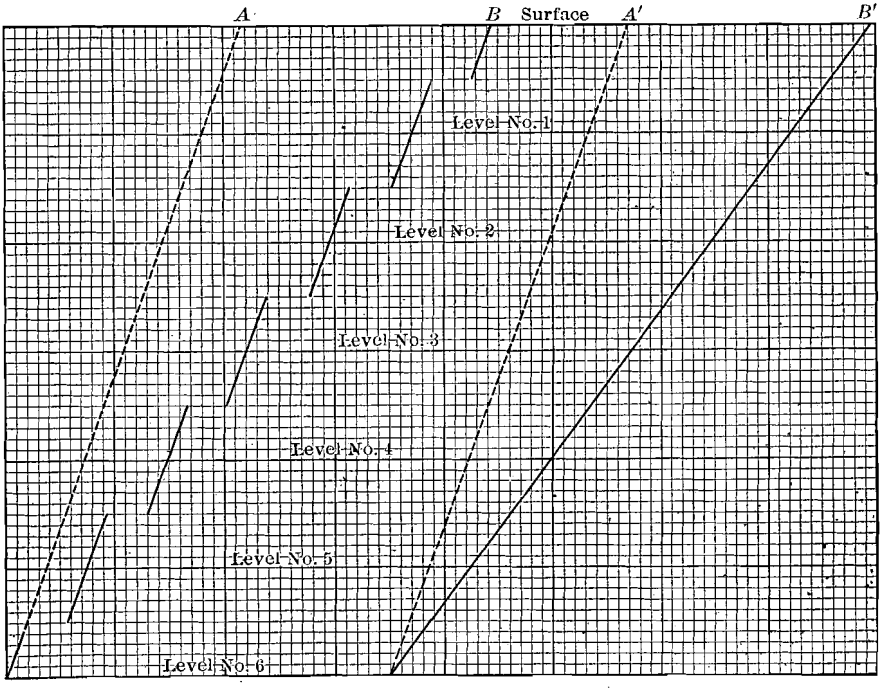


FIG. 1.—CORRECT AND INCORRECT WAY OF PLATTING A VERTICAL SECTION OF A VEIN.

platting of the same on sections, it has occurred to the writer that the accompanying diagram may be of use to others who at times may be called upon to prepare numerous sections. For example, a great mass of data on strike and dip of ore bodies is collected underground in separate

shafts, on different levels, drifts, cross-cuts, raises, winzes, etc. In assembling these data and preparing vertical sections the various dips of the deposit are frequently platted just as recorded underground. The result is that a deposit, which may be continuous from the surface to the lowest level, appears on the vertical section as a series of disconnected fissures having dips ranging from 0° to 90°. This is due to the fact that observations are taken in various parts of the mine and the plane of the vertical section is rarely, if ever, at right angles to the strike of the vein throughout the course of its dip plane.

Fig. 1 represents the correct and incorrect way of platting a vertical section of the same vein where observations have been taken at different levels on a vein having a uniform dip. In this ideal figure it is presumed that each level intersects the vein at the same angle. *A* and *A'* represent the platting of a vein having a uniform dip of 70° on a section the plane of which is at right angles to the strike of the vein. *B* represents the same vein incorrectly platted on a section the plane of which intersects the strike of the vein at an angle of 30°. Observations of the dip and strike of the vein were made on each level and the vein platted with its actual dip. *B'* represents the same vein correctly platted on a section the plane of which intersects the strike of the vein at an angle of 30°.

While the formula for determining the apparent dip of a vein to be platted on a vertical section may be known to many, this method of determining apparent dips involves a very tedious series of computations if the sections are numerous. The accompanying dip chart, Fig. 2, is submitted with the hope that it may save much laborious calculation in preparing vertical sections. This diagram is not original with the writer. D. W. Brunton devised a somewhat similar method for his own use at Butte, about ten years ago, and he now has in the process of manufacture "Brunton's Slope Chart," a 9 by 10-in. cardboard diagram with a swinging arm which can be read to a quarter of a degree and is complete for dips ranging from 0° to 90°. This will be entirely satisfactory for office use.

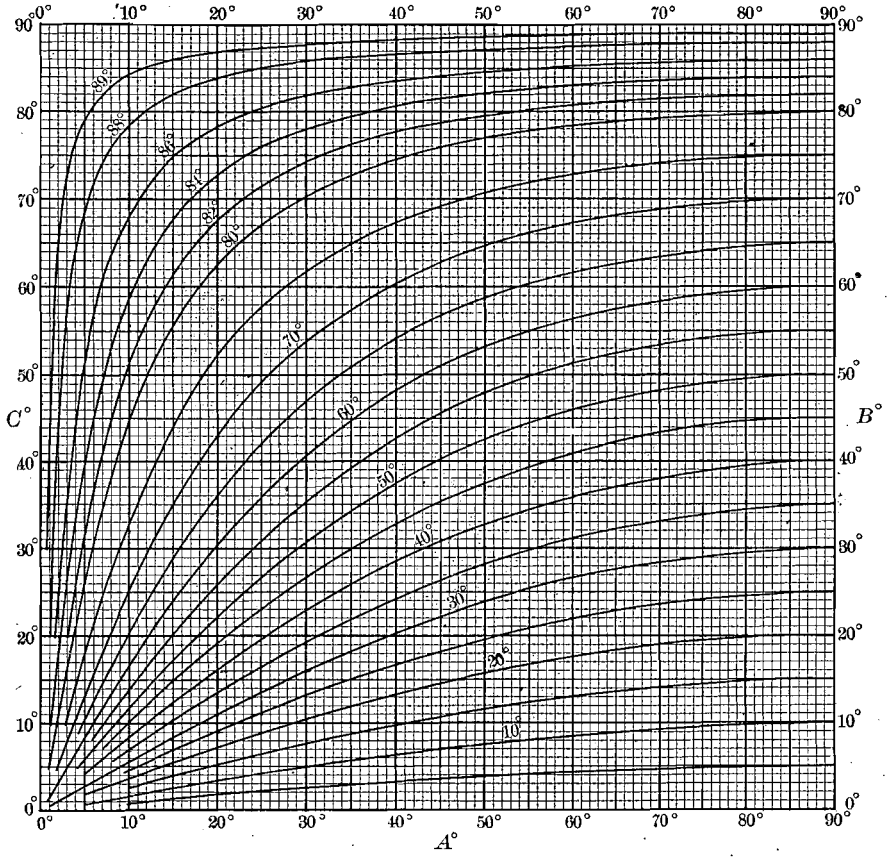
In 1912, D. F. Hewett published[1] a brief description of A Graphic Method for Dips on Geologic Sections. This was accompanied by a diagram, 7 by 7 in., on thin paper, which showed graphically the determinations for platting dip angles differing by 5°. Mr. Hewett's chart is available only to readers of *Economic Geology*. Furthermore, it is too large for field use, and the dip angles have 5° intervals.

The accompanying dip chart, prepared by A. B. Crosley, is of such size that it can conveniently be placed in the back of the ordinary field notebook, and the intervals between angles of dip of veins from 80° to 90° are only 2°. Hence, intersections with the vertical section for veins dipping over 80° can be more accurately platted with this diagram than by Mr. Hewett's.

[1] *Economic Geology*, vol. vii, No. 2, pp. 190, 191 (Mar., 1912).

Mr. Brunton's slope chart is more accurate than either Mr. Hewett's or the diagram here presented. However, it is not practicable to carry Mr. Brunton's chart in the field, its use being confined primarily to the office.

In using this diagram it is to be remembered that the angles indicated at the bottom (A) represent the difference in strike of the vein it is



A Vein with Dip B°, Intersecting a Line of Section at an Acute Angle A°, is Platted on the Section with an Apparent Dip C°. Formula Tan: C° = Sin A° Tan B°.

Fig. 2.—Dip Chart.

desired to plat and the plane of the vertical section. The curved lines represent dips of veins (B). The points of intersection of the vertical lines (above A) with the curved lines (true dip lines B) at the horizontal lines (C) are the apparent dips at which the veins should be platted on the vertical section. For example, the strike of a vein dipping 86° intersects the plane of a vertical section at an angle of 25°. It should be platted on the vertical section with an apparent dip of 80° 30′.