NOTES AND NEWS

NOMOGRAMS FOR CORRECTING ANGLE OF TILT OF THE UNIVERSAL STAGE

A. W. KLEEMAN, *Adelaide University, South Australia.*

The writer and senior students at Adelaide University have for some time been using nomograms for correcting the angle of tilt on the universal stage when the refractive index of the mineral differs from the refractive index of the hemisphere. Unlike the Federow diagram (cf. Emmons, 1943, plate 8) a separate nomogram must be used for each hemisphere.

The nomograms consist of three parallel scales, one for the observed angle of tilt, one for the refractive index of the mineral and the third for true or corrected angle of tilt. The two scales for angle of tilt are identical and are graduated with the logarithm of the sine of the angle. In the original drawing from which Fig. 1 was prepared two angles of which the logarithms of the sines differed by 0.10 were placed 2 inches apart.

The scale for refractive index has been plotted so that two numbers, the logarithms of which differed by 0.10 are 1 inch apart.

In constructing the nomogram the two scales for angle of tilt were drawn parallel and 5 inches apart. As one is inverted with respect to the other, lines joining the pairs of graduations on the two scales all intersect in a common point. This point represents the condition when the true angle of tilt is the same as the observed angle of tilt, i.e. when the refractive index of the mineral is the same as the refractive index of the hemisphere. For the high index prism (Leitz 1.648 or Bausch and Lomb 1.649) the 1.65 point of the refractive index scale is placed at this point with the scale paralled to the other two scales.

If the scales for angle of tilt were graduated for all angles 1°–55°, they would be 33 inches long. In order to keep the nomogram to a reasonable size and still keep the graduations of the refractive index scale open the main scale was restricted to a range of 17°–55° (larger upright figures), and a supplementary scale with smaller sloping figure drawn to cover the range 7°–19°. A third scale covering the range 3°–8° can be added (preferably in another colour of ink) to complete the range of angles when dealing with minerals in which the refractive index differs widely from that of the hemisphere.

The momograms for other hemispheres differ only in that the refractive index of the hemisphere (1.516 or 1.559) lies on the intersection point.

The nomograms are used by placing a straight edge on the point representing the observed angle and the refractive index of the mineral

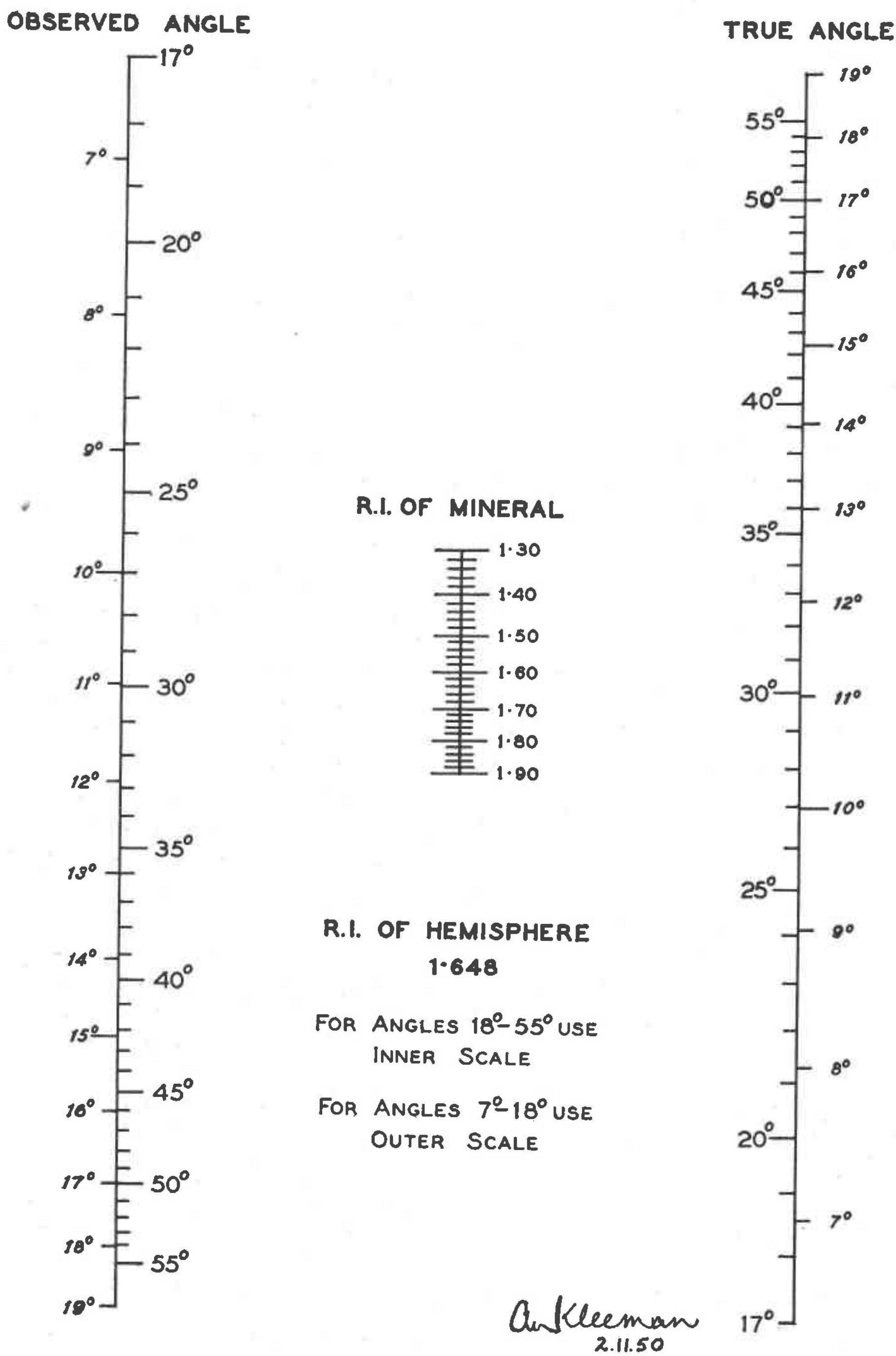
OBSERVED ANGLE
TRUE ANGLE
R.I. OF MINERAL
1·30
1·40
1·50
1·60
1·70
1·80
1·90
R.I. OF HEMISPHERE
1·648
FOR ANGLES 18°–55° USE INNER SCALE
FOR ANGLES 7°–18° USE OUTER SCALE
A. W. Kleeman
2.11.50

FIG. 1.

on the left hand and middle scale, respectively, and reading the true angle from the right hand scale.

REFERENCE

EMMONS, R. C. (1943), The Universal Stage: *Geol. Soc. Am., Memoir* 8.

ANOMALOUS BEHAVIOR OF MONTMORILLONITE CLAYS IN CLERICI SOLUTION

J. L. RODDA*

Clerici solution (thallium formate-malonate mixture) is a very useful medium for separating minerals because of the high specific gravities attainable and the ease with which specific gravities may be changed by dilution or concentration. Occasionally reactions occur between mineral and solution which may prove troublesome or even be useful.

Holzner, working with stilpnomelane[1] and stilpnochloran,[2] later shown by Gruner[3] to be nontronite, demonstrated a base exchange reaction in which thallium replaced the alkalies, and in the case of stilpnochloran, the calcium and part of the water as well. The treated mineral contained up to about 13% thallium oxide. The specific gravity of stilpnomelane was raised from 2.823 to 3.068, and of stilpnochloran from 2.523 to 3.111. Behavior was normal in acetylene tetrabromide-benzol solution.

During some recent work in this laboratory, differences were noted in the behavior toward Clerici solution of kaolinite on the one hand, and of montmorillonite and its zinc-bearing variety, sauconite, on the other. Ninety-two per cent of the kaolite sample floated at a specific gravity of 2.70 while 97% and 87%, respectively, of the montmorillonite and sauconite samples sank at 3.55 specific gravity. Semiquantitative spectrographic analyses of the washed samples showed that the montmorillonites had taken up appreciable amounts of thallium (Table 1). Both montmorillonite and sauconite floated in methylene iodide at specific gravity

* Research Department, The New Jersey Zinc Company (of Pa.), Palmerton, Pennsylvania.

[1] Holzner, J., Beiträge zur Kenntnis der varistischen Gesteins und Mineralprovinz in Lahn-Dillgebiet.-2. Über den Stilpnomelane von Grube Theodor (Lahngebiet) und einem beim Trennen mit Clerici-lösung auftretenden Basenaustausch: *Neues Jahrbuch für Min. Geol. u. Pal., Beilage Band*, **66**, Abt. A, pp. 213–225 (1933).

[2] Holzner, J., Neue Daten über den Stilpnochloran von Gobitschau (Mähren), zugleich Bericht über eine ungewöhnliche Umtauschreaktion: *Centralblatt für Min., Geol. u. Pal.*, Abt. **A**, pp. 250–256 (1934).

[3] Gruner, John W., The structural relationship of nontronites and montmorillonite: *Am. Mineral.*, **20**, 475–483 (1935).