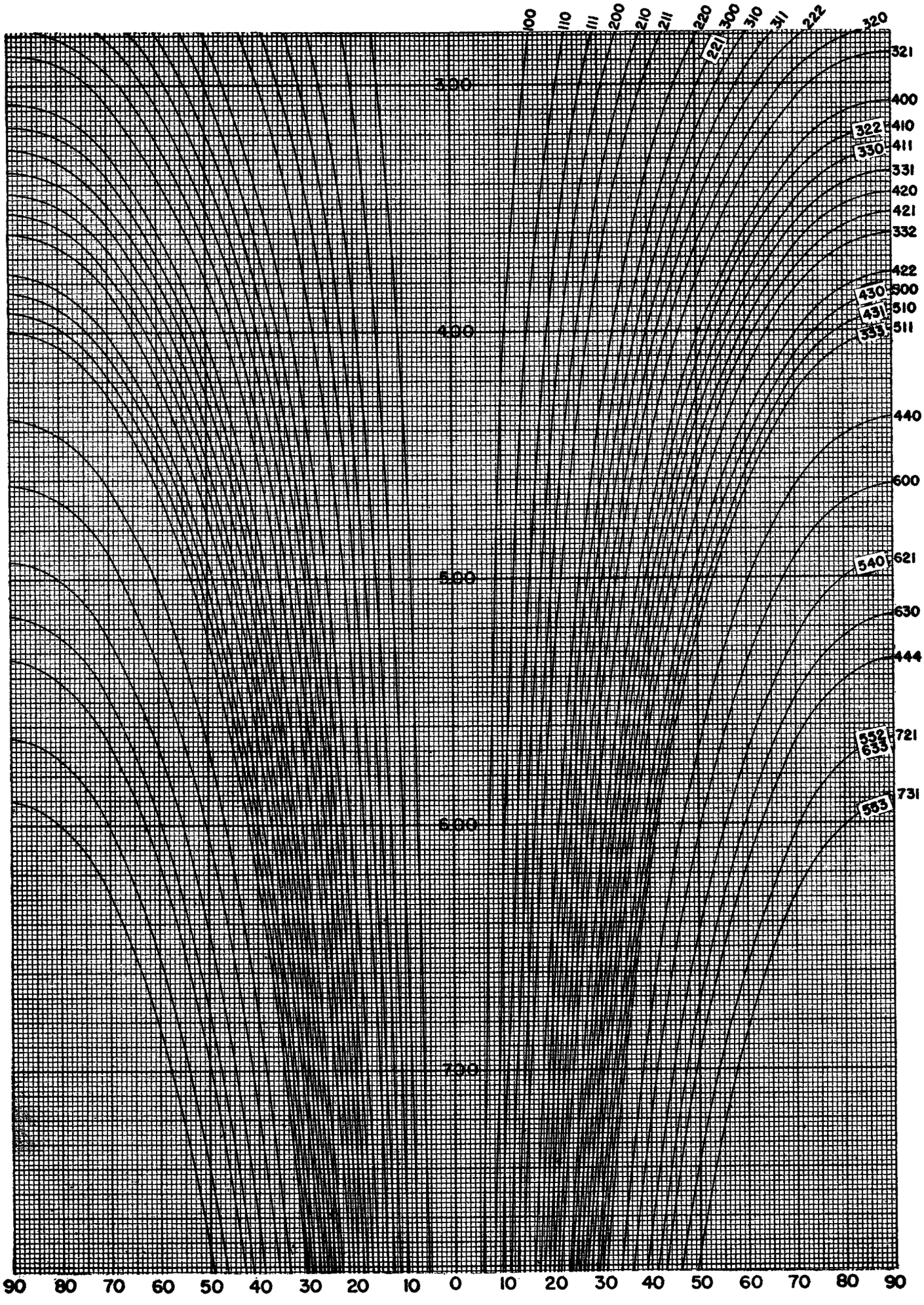
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731
553
90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90

FIG. 1

GRAPHICAL INTERPRETATION OF CUBIC POWDER PATTERNS

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The graphical method in common use for the interpretation of cubic powder patterns requires that measurements be made on the film and spacings calculated and plotted on a movable strip which is adjusted to a plot of the variations of the spacings with axial length. Considerable time is spent in making the calculations and plotting them, and the axial length so determined is precise only to the nearest few hundredths of an Ångstrom. If, instead of plotting the variations of the spacings, one plots the variations of the positions of the reflections on the film itself against axial length, a chart can be constructed by use of which cubic powder patterns can be interpreted by inspection. The axial length determined in this manner will be of the same order of precision as in the older method, and the time consumed in calculating and plotting spacings will be saved.

Of course, a chart constructed in this manner is useful only for films made with a specific wave-length and in a camera of a specific diameter. The chart reproduced to the correct scale in Fig. 1 is designed for patterns made with copper $K\alpha$ radiation in a camera of the type described by Buerger[1] and having a diameter of 57.26 millimeters. By appropriate photographic enlargement or reduction, Fig. 1 may be adapted to any wave-length or camera diameter.

In use the chart is placed on a viewing stand or other suitably illuminated table. The film is placed on the chart and moved up or down until every line on the film matches one on the chart, with the exception of certain high order reflections of low multiplicity which have been omitted for the sake of clarity. Because of lattice type or crystal structure requirements, certain lines on the chart may be missing on the film, but every line on the film must be on the chart, except as noted above. The agreement must, of course, occur along the center line of the film, and it is wise to rule a center line with a soft pencil.

When an agreement has been found between the lines on the film and the chart, the length of the axis to the nearest few hundredths of an Ångstrom may be read from the position of the center line of the film along the ordinate of the chart. The indices of the reflections are indicated at the edge of the chart.

[1] Buerger, M. J., *Am. Mineral.*, **21**, 11 (1936).