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## Crystal orientation on the Weissenberg goniometer.

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Setting a crystal zone axis accurately on a goniometer head is sometimes difficult because of the lack of crystal faces or cleavage surfaces on the specimen. There are several ways to adjust crystals by X-ray methods; each method is in general suited best for a particular apparatus. Bunn (1945, pp. 173–5) described the use of a standard oscillation camera to measure the inclination of the zero-layer line at the point where the primary beam strikes the film, so as to derive the corrections to be applied to each of the arcs of the goniometer adjusting head. In making analogous adjustments of a crystal for a Weissenberg instrument, the modification of Bunn's method here described has been found rapid and accurate.

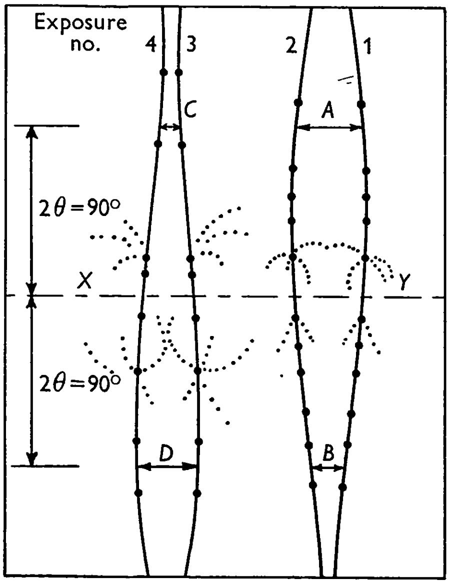


Fig. 1. Parts of four Laue patterns recorded on cylindrical film in a Weissenberg camera. The crystal was rotated 180° between exposures 1 and 2, and between 3 and 4, but only $-90°$ between 2 and 3. The film was translated a short distance, Weissenberg fashion, between successive exposures. For radian-diameter camera, the angular corrections to the adjusting arcs of the goniometer head are $\frac{1}{2}(A-B)$ and $\frac{1}{2}(C-D)$, respectively. $A$, $B$, $C$ and $D$ are measured in millimeters, and corrections in degrees.

Several Laue patterns can be recorded on different parts of a radian-diameter Weissenberg film with short exposures (e.g. 5 min. at 50 kV., 20 mA.) by simply moving the film carriage 2 or 3 cm. between successive exposures. Two such exposures are made with the plane of one of the goniometer adjusting arcs normal to the X-ray beam, the crystal-rotation axis being turned 180° between the two. The difference $(A-B)$ in the separations $A$ and $B$ (Fig. 1) between the 'zero-layer' Laue zone lines at the positions corresponding to $2\theta=\pm 90°$, is then proportional to the angular correction to be applied to the particular adjusting arc. Two additional exposures with the second adjusting arc normal to the X-ray beam provide similar data $(C-D)$ for its correction. If four exposures are made as just described, the film may be measured with a pair of dividers immediately after development, without waiting for rinsing, fixing, washing and drying.

The exposure time can be reduced by one-half by eliminating the second exposure for each goniometer arc; but then the film must be processed completely and dried before the necessary construction line $XY$ can be drawn accurately enough on it to determine the *angular* deviation (Bunn's method) of the 'zero-layer' Laue zone lines from perpendicularity thereto. If this construction is used, the primary beam must be allowed to strike the film for a second near each end of the film traverse. The few minutes saved in exposure time will then probably be more than offset by the additional time for processing the film and reading it.

### Reference

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## Silicon carbide of 594 layers.

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A number of modifications of the crystal structure of silicon carbide, SiC, have been reported, the difference between which, as is well known, arises from various sequences of the basic layers of three species $A$, $B$ and $C$. The number of the layers stacked within one lattice period in the direction of the hexagonal $c$ axis of these modifications are respectively 3, 4, 6, 15, 21, 33, 51, 87 (Jagodzinski, 1949) and about 230 (Zhudanov & Minervina, 1947). The crystal is also of special interest in respect to the stacking disorder which results in continuous distributions on the reciprocal-lattice rods parallel to the hexagonal $c$ axis for which $h+2k=0$ (mod. 3) (Jagodzinski, 1949; Honjo, 1949).

In the course of X-ray study on the single crystals of this substance we recently found a sample which is distinguished by the fact that it contains partly a new modification having an extraordinarily long period, the other part of it being composed of the structure with 6-layer period (SiC(6)). Fig. 1 shows an oscillation photograph taken by oscillating the crystal through 5° around the $c$ axis so as to record specifically the $(10\bar{1}l)$ rod for which $h+2k=1$. It looks at a first glance as if the pattern