If the precipitation process is governed primarily by drift flow, then one would expect an asymmetrical distribution of concentration around the dislocation core, due to the angular dependence of the potential field[4]. Our assumption, however, of the predominance of pure diffusion flow would lead to a radially symmetrical distribution. Silicon provides a unique opportunity to distinguish between these two possibilities. The flow of aluminium (a *p*-type impurity) to form such strings of precipitates as shown in Fig. 1 clearly depletes the region in the neighbourhood of each dislocation. Thus a *p–n* junction would be produced in this region if the crystal initially contained both phosphorus and aluminium, the concentration of the latter being slightly in excess, since no precipitation of phosphorus occurs. The trace of such a *p–n* junction is a line of equal aluminium concentration, and may be revealed as a step on the surface of the crystal by using the Dash etch[5]; at the same time, an etch pit is produced at the point of emergence of the dislocation line. Examples of this are shown in Fig. 2. The *p–n* junctions are seen to be circular and concentric about the etch pits, supporting our argument for radially symmetrical flow to the dislocations. A more stringent test would be to examine this contour after much shorter diffusion times; however, the technique is only feasible when the radius of the *p–n* junction is greater than the radius of the etch pit.

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Neutron Diffraction at a High-Flux Reactor

Up to the present, all neutron diffraction studies in Great Britain and practically all structural studies elsewhere have been carried out with neutron beams from reactors which have a peak flux of a few times 10^{12} neutrons per sq. cm. per sec.; for example, at Harwell the reactor Bepo has been used for this work. We have now made preliminary measurements with a spectrometer at the research reactor Dido, where a peak unperturbed flux of about 5×10^{13} neutrons per sq. cm. per sec. is available. We achieve in practice an increase of about twenty times the intensity of our neutron beam, and this increase is available for reducing proportionately the size of the sample for study. The advantage of this, for solid-state studies with neutron beams, can be seen in two ways.

For materials which are available only in polycrystalline or powder form it was previously necessary to use about 5 c.c. of material in order to attain reasonably large diffracted intensities and adequate angular resolution. The same result is now obtained with a volume of 0·3 c.c. This quantity of diamond powder, often used as a standard substance, has given peak intensities of 560 and 460 counts per min. for the (111) and (220) reflexions respectively on a background of 40 counts. Apart from the more obvious advantages of using small samples, there is an important prospective gain for magnetic materials: it will become a practical proposition to make samples with the iron isotope, iron-57, which has a nuclear scattering amplitude less than a quarter of that of ordinary iron and which is correspondingly less troublesome when distinguishing between the contributions from nuclear and magnetic scattering.

For single crystal investigations, a reduction in size by twenty times enormously increases the range of materials which can be obtained in crystals of sufficient size to be studied. Over the past few years structural studies have been made at Harwell using single crystals of many chemical compounds. The average size of crystal used has been 160 c. mm.; thus this now becomes about 8 c. mm., or a fragment with an edge of about 2 mm. each way. We quote as an example a result for potassium bromide which serves as a standard substance; a cleaved block with a volume of 5 c. mm. gave a peak count of 7,000 neutrons per min. for the (200) reflexion. As well as widening the range of materials which can be studied as single crystals, reduction of size brings the important additional advantages that corrections for secondary extinction will be much less significant, and crystal preparation using selected isotopes, for application of the isomorphous replacement method of structural analysis, will become practicable.

A description of the spectrometer, with an account of the problems posed by the higher flux, will be published elsewhere.

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Tensile Strength of Asbestos

Asbestos is the generic name for those silicate minerals which cleave naturally into fibres, the three important species being chrysotile (white asbestos), crocidolite (blue asbestos) and amosite. This unique mineral structure lends itself better to measurements of tensile strength than do the more common minerals with isotropic or platy structures, which are extremely difficult to prepare in the form of adequate tensile specimens, although measurements on mica have been reported[1].

Very high values may be predicted for tensile strengths of silicates, from consideration both of the strengths of the stable silicon–oxygen chains or sheets which characterize these minerals, and of the cohesive pressures which exist in solids, and which must be equalized in order to break a specimen. An explanation for the discrepancy, which exists between the estimated tensile strengths of solids and the highest values usually obtained in practice, was given by Griffiths[2,3], who said in effect that the high strengths calculated were correct and that the tensile measurements were wrong. The tensile strength of asbestos has been measured by Syromjatnikoff[4] and by Badollet[5], who have reported various values, but