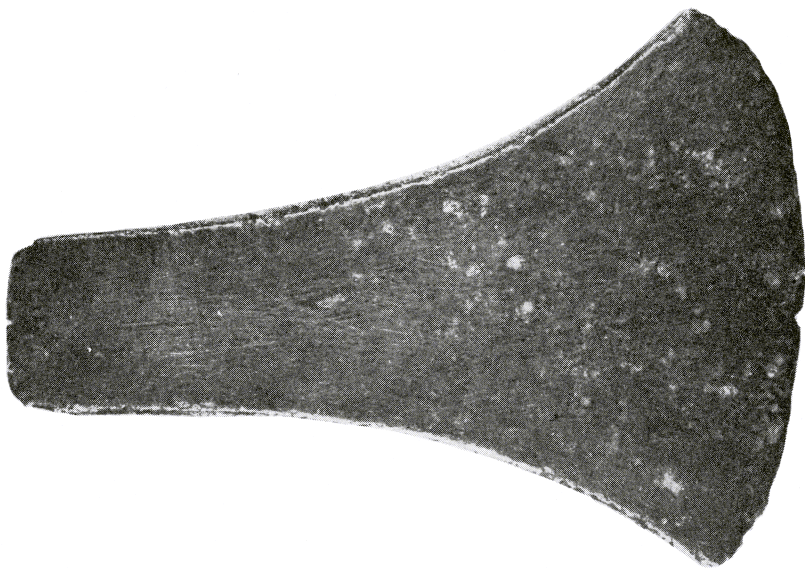


PLATE I



1.



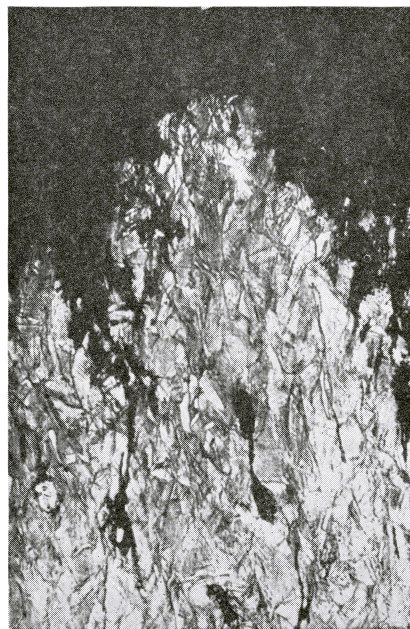
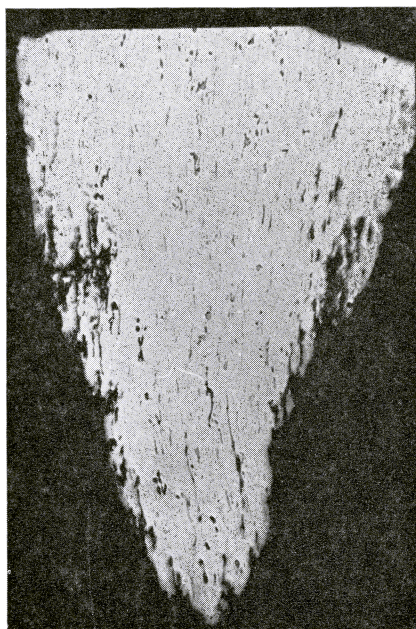
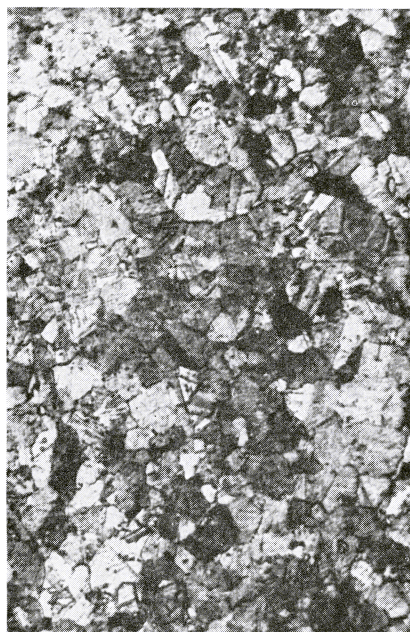
2.



1. Thames between Windsor and Maidenhead (no. 8) Face of the axe ; 2. Dublin (no. 9) Face of the axe.



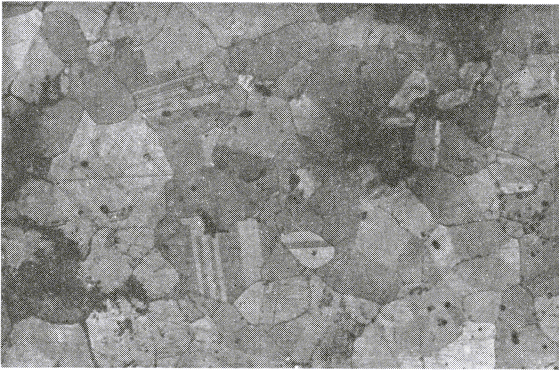
# PLATE II



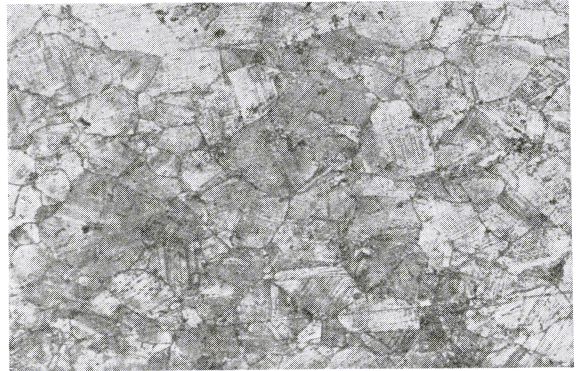
1. Bray (no. 1). Section A. The slender cutting edge. Plastic deformation and elongation of inclusions suggest hot working of the metal during some phase in fabrication. Unetched  $\times 30$  : 2. Bray (no. 1). Section A. Recrystallisation in the mass of the metal remote from the cutting edge. Non-metallic inclusions and a pool of  $\alpha\delta$  eutectoid are seen in this field. Etched  $\times 200$  : 3. Bray (no. 1). Section A. Showing the deformed structure at the cutting edge. The crystals are highly deformed and twin bands and strain lines bent. Etched  $\times 200$  : 4. Chelsey (no. 2). Section A. Showing the structure of equi-axed twinned crystals of rather low grain size at the cutting edge. Etched  $\times 50$ .



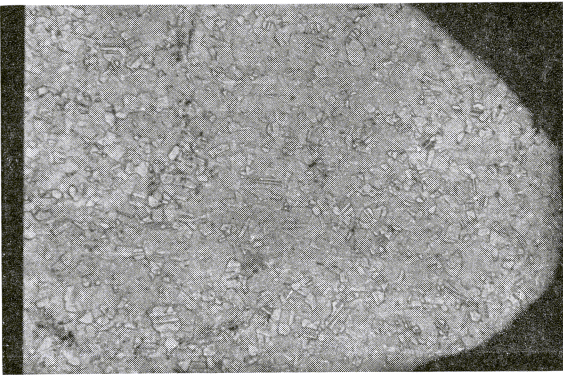
# PLATE III



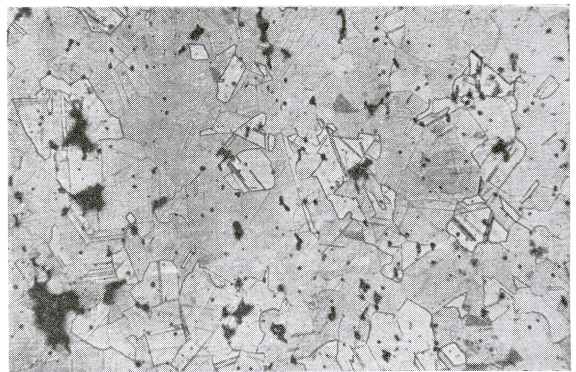
1.



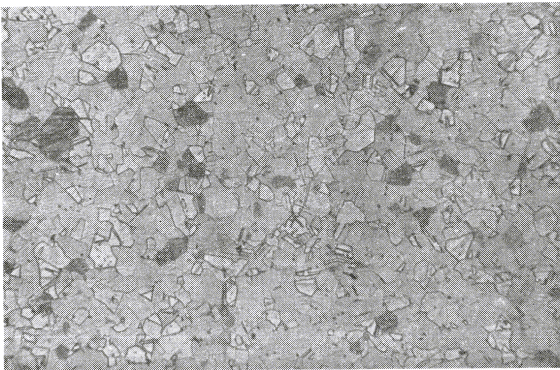
2.



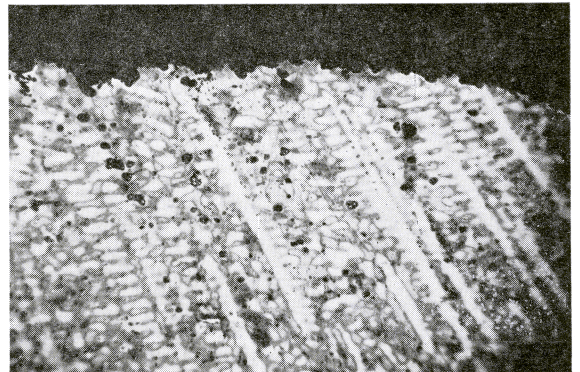
3.



4.



5.



6.

1. Cholsey (no. 2). Section B. Recrystallisation in the mass of the metal of the section taken from the body of the axe. Here the grain size is greater than in section A. The black spots are porosity. Etched  $\times 50$  : 2. Cholsey (no. 2). Section B. A field taken in the rounded shoulder of the body section. Here the metal has been more highly worked and the structure is of lower than average grain size. Etched  $\times 50$  : 3. Cholsey (no. 3). Section A. A field in the region of the cutting edge. The structure is of very low grain size and the crystals are not deformed or slip-banded. Etched  $\times 400$  : 4. Cholsey (no. 3). Section B. Twinned crystals of much higher grain size in the specimen taken from the body of the axe. The large black marks are porosity. Etched  $\times 100$ . 5. Cholsey (no. 3). Section B. The structure in a field at the rounded edge of the section. In the majority of these crystals slip bands are detected. Etched  $\times 100$ . 6. Wallingford (no. 5). Section B. Showing the substantially 'as cast' structure of the casting. The dendrites have not been deformed by any forging or hammering operation. This structure is characteristic of those revealed throughout sections A and B. Etched  $\times 20$ .



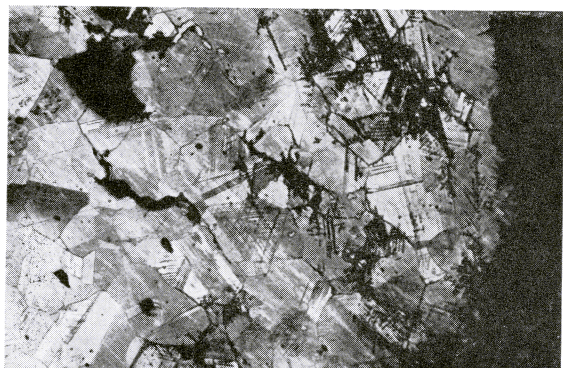
# PLATE IV



1.



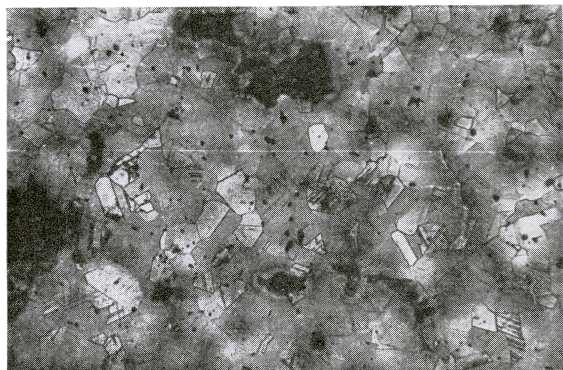
2.



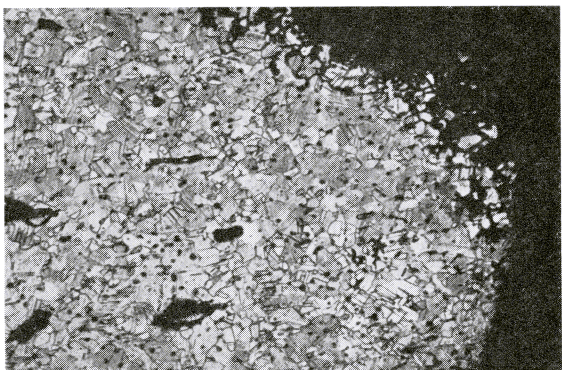
3.



4.



5.



6.

1. Windsor (no. 6). Section A. A field at the edge of the section remote from the cutting edge. The equi-axed twinned crystals are of low grain size and are slip-banded. Etched  $\times 200$  : 2. Windsor (no. 6). Section B. A field taken in one of the rounded edges of the section from the side of the axe. Here the equi-axed twinned crystals do not exhibit slip banding. Etched  $\times 200$  : 3. Thames between Windsor and Maidenhead (no. 8). Section B. Twinned crystals of medium grain size at the edge of the specimen. Slip plane corrosion, indicating the presence of existing slip, is observed. In general the metal of this section is highly porous. Etched  $\times 100$  : 4. Dublin (no. 9). Section A. Equi-axed slip-banded twinned crystals of very low grain size in the cutting edge section. In this field marked relics of coring are seen. Etched  $\times 200$  : 5. Dublin (no. 9). Section B. The structure in the mass of the metal of the section taken from the body of the axe. Grain size is much increased and some relics of coring remain. Porosity and voids are seen in this field Etched  $\times 100$  : 6. Jersey (no. 10). Section A. The structure of equi-axed twinned crystals at the cutting edge. These crystals are not deformed and do not exhibit slip bands. The small black marks are porosity. Etched  $\times 100$ .