

PREPARATION OF GLASS KNIVES WITH A FINE CUTTING EDGE BY MEANS OF A SPECIAL KNIFE MAKER

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A new type of knife with an extra-fine cutting edge is described.

The preparation of good electron-microscopic sections depends on many factors including the availability of a good knife.

The authors have given consideration to the fact that knives with a plano-convex cutting edge (Fig. 1a) can cut more thinly than the ordinary standard straight knives (Fig. 1b).

The preparation of a plano-convex knife is not difficult. The square from which the knife is made must be placed in the position shown in Fig. 2 before the cut is made. If this is done, in every case without exception a knife with a plano-convex cutting edge is obtained from the right half of the square. The angle β and the corresponding angle α of these knives are 3-5° greater than for the corresponding straight knives.

The finer cutting edge of plano-convex knives is due primarily to a change in the profile of the cutting edge of the knife which gives it greater rigidity, and also to the shape of the blade itself, which does not cut into the tissue block along the whole length of the pyramid at once, but begins to cut only with the most forward part of the blade, like a pointed space. Unlike straight knives, of which as a rule only half or, at best, two-thirds of the cutting edge is suitable for cutting, and whose right-hand part knife has cracks and dents, the cutting edge of plano-convex knives is perfectly smooth throughout its length and all of it can be used for cutting sections.

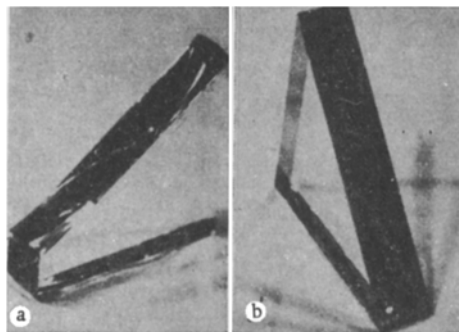


Fig. 1

Fig. 1. Glass knives (explanation in text).

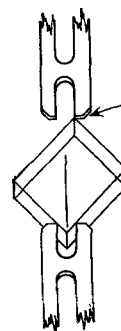


Fig. 2

Fig. 2. Position of the square for obtaining a plano-convex knife.

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The writers have also found that plano-convex knives suffer less damage when cutting pyramids. They are also convenient because, with their tapered angles they are less likely to displace the block from the holder when the pyramid is cut, and this may also help to prevent vibration during cutting. Finally, the percentage of plano-convex knives of good quality which can be obtained is considerably higher than the percentage of straight knives, and is close to 100.