

NOTES AND NEWS

MOUNTING AND REMOUNTING DETRITAL MINERAL GRAINS ON SLIDES

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REPAIRING OLD SLIDES

At the petrographic laboratory of the University of Kansas, it was found that a reference set of detrital mineral slides, purchased from a British firm some twelve years ago, had become unusable through deterioration. In many the balsam was badly cracked and discolored, and in some the cover glasses had separated and fallen off. A search of the standard manuals found instructions only for repairing thin sections,¹ hence it was found necessary to work out some modified procedure applicable to detrital mineral mounts. Three possible methods suggested themselves: (1) Mechanical separation and remounting of the grains. This would entail separation and disintegration of the original mount, removal of mineral grains by hand picking, and transfer to a new slide. (2) Chemical separation of grains and remounting. This would involve removal of old balsam by solution in xylol, or by treatment with some chemical, such as acetone, leaving the residual mineral grains available for remounting. (3) Treatment of the original mounting material to restore its serviceability. The latter method was selected as most promising of convenience and rapidity, and the following procedure was evolved through trial and error. It is passed on with the hope that other geologists may be spared the loss of time and materials entailed by experimentation.

1. First, the cover glass, if not already separated, is wedged off with a needle point or knife edge. The entire mount may adhere either to the object glass or to the cover glass, and in either case the subsequent treatment is the same. If part adheres to one and part to the other, that part on the cover glass is scraped off onto the object glass. In any event, however, as much as possible of the deteriorated balsam around the edges of the mount is chipped off with a needle point and discarded.

2. The object glass or cover glass carrying the mineral grains and adhering balsam is next placed on a hot plate at a temperature just sufficient to slowly melt the balsam. Either an adjustable electric hot plate, or a metal plate heated by a microbunsen burner, may be used. Temperature may be tested with a small lump of solid balsam on a separate object glass.

3. If bubbles form as the balsam is heated, they are dispelled by

¹ Holmes, Arthur, *Petrographic Methods and Calculations*, Murby, London, 1930, 243.

cautiously applying droplets of xylol from a wire, glass rod, or capillary tube. In general, the xylol should be added at the *edge* of the balsam, as otherwise the latter tends to be spread out over the slide too far. Following clarification, more balsam, in xylol solution, is added if necessary, and the bubbles dispelled as before if a new crop appears.

4. The procedure is completed by carefully lowering a clean cover glass, previously heated, over the mount, instantly withdrawing the slide, and allowing it to cool. When cool, the balsam should still be soft enough to receive a dent from a needle point without cracking. With practice, the entire operation outlined above, may be completed in 5 to 10 minutes per slide.

MAKING MULTIPLE MOUNTS

The recent introduction of various synthetic resins having refractive indices up to 1.71² makes possible the permanent mounting of minerals in different media on the same slide. This is convenient for several purposes:

1. Mounting light and heavy mineral crops from the same sample on the same slide, each in a medium of index most suitable for study of its particular composition. In this way the minerals from each sample are kept together, and duplicate indexing and filing are avoided.

2. Mounting portions of the same heavy mineral crop in different media on the same slide. Identification of the minerals in multifarious assemblages may be facilitated by study of relative relief and indices in mounting material representing well-spaced points on the refractive index scale. By having the different mounts on the same slide, comparison is made easier and more rapid. In preparing slides for this purpose, the heavy mineral concentrate is split into two or three equal and representative fractions, and these are mounted side by side. Mineral counts may be made in the usual way for each mount, and the results totalled.

3. Preparing reference or study sets for students. For this purpose, grains of the same mineral may be mounted on the same slide in two or three different media. Grains of assorted sizes and shapes are preferable, and for the more common detrital minerals these may be obtained by hand picking from screened sands under the binocular microscope. A selection is made from each fraction of each sample. An alternative method for minerals less readily available in this way is to crush and

² Cameron, E. N., Notes on the synthetic resin hyrax: *Am. Mineral.*, **19**, 375-383 (1934).

Keller, W. D., A mounting medium of 1.66 index of refraction: *Am. Mineral.*, **19**, 384 (1934).

Alexander, A. E., Recent developments in high index resins: *Am. Mineral.*, **19**, 385 (1934).

screen a larger specimen of the desired mineral. A few grains from each screen below 0.5 mm. are used for each mount. These of course will fail to show typical shapes and textures of water-worn grains, but will display characteristic optical properties.

For making multiple mounts, slides 1 in. by 3 in. are preferable. The object glass is placed on a hot plate, the mineral grains are added at two or three separate spots, and the mounting material applied. If necessary, an even distribution of the grains may be effected by applying one or more drops of xylol. With two mounts on a slide, the procedure is simple, but with three more care is required. As an example, it may be assumed that a given mineral or mineral assemblage is to be mounted in: (a) balsam or kollolith³ (index c. 1.54), (b) aroclor 4465⁴ (index c. 1.66), and (c) hyrax⁵ (index c. 1.71). These media are applied in the order of

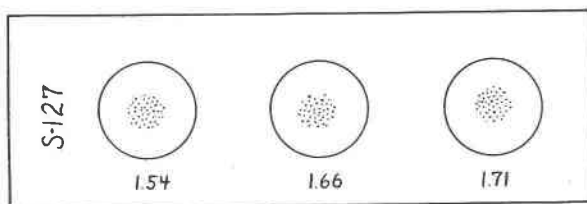


FIG. 1. Diagram of slide with three mounts, natural size.

decreasing melting points, hyrax first and aroclor last. Hyrax may be used satisfactorily in the solid form; for supplementary discussion, however, the reader is referred to the paper by Cameron. If bubbles develop, they may be removed by treatment with drops of xylol. In this event, however, care must be taken to avoid excessive spreading of the material, and to make certain that the xylol is all driven off, if the maximum refractive index is desired. Balsam may be used in either solid or dissolved form, the latter being less likely to develop bubbles. Aroclor 4465 is used in solid form, and causes no difficulty with bubbles. When all three mounts are ready, cover glasses are placed on them and the slide is withdrawn and allowed to cool. The final step consists in labelling the slide, and this is best done with a diamond marking pencil. In addition to the regular serial number or name, it is desirable also to place under each mount its refractive index. The completed slide will have the appearance shown in Fig. 1.

³ Obtainable from Voigt & Hochgesang, Göttingen, Germany.

⁴ Described by Keller, *op. cit.* Obtainable from Monsanto Chemical Company, St. Louis, Mo.

⁵ Described by Cameron, *op. cit.* Obtainable from Eimer and Amend, New York City.