

names. In contrast to those of the first group, terms of the second group indicate not a singular feature but rather all the textural features of the type rocks from which they are derived. Moreover, when such terms are used mineralogical as well as textural similarities to the type rock are automatically implied.

It would seem advisable to avoid the synonymous use of terms from these two fundamentally different groups. To give a list of synonyms, as Johannsen does, is doubtless very useful if the large number of textural and structural terms is considered; but in some cases it would seem desirable to define more precisely those terms which have similar but not synonymous meanings. With the development of every science the need increases for exact terms sharply defined.

Priority of descriptive terms is recognized in all branches of natural science. However, in petrography the historical priority cannot be adhered to strictly because the microscope was not used until 1858 to reveal with some precision the textural, structural, and mineralogical features of rocks.

Special consideration should be given when similar terms are used with reference to different rock groups. An example is the choice of the terms "automorphic" or "idiomorphic." As the term "idioblastic" is widely used in relation to metamorphic rocks, preference should be given to the term "idiomorphic" in describing igneous rocks, in spite of the historical priority of the term "automorphic."

#### MICROSEPARATION OF MINERALS IN HEAVY LIQUIDS

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A technique which may save much work and which has been found useful in separating and identifying mineral grains is that of using drops of heavy liquid on a microscope slide. The operations are best performed under a binocular microscope.

A few drops of any suitable liquid, such as methylene iodide, are placed on a microscope slide and a small quantity of the granular material under investigation stirred in with a needle. The heavy particles will quickly settle to the surface of the slide, while the light particles will rise to the center of the drop at the surface.

The float material may then be removed by lightly touching a narrow strip of blotting paper to the top of the drop, leaving the sink material immersed in the drop. Quartz may be easily removed from minor heavy

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minerals by this method. The refractive indices of the heavy minerals may then be compared with that of the liquid by standard procedures or the grains cleaned for further study.

If the float fraction is to be studied, a glass slide is carefully lowered into contact with the top of the drop of liquid, then withdrawn, when a considerable portion of the float material and some of the liquid will be removed and may be studied on the slide.

It will be seen that the liquid serves two purposes: (1) as a specific gravity standard; and (2) as a refractive index standard. An ideal set of liquids should embrace several refractive index standards for each specific gravity value so that indices may be rapidly determined on a freshly separated portion of sample rather than going through the messy operation of cleaning up a fraction and adding new liquid. Pure compounds are preferable to mixtures because of the constancy of their properties, but the number of liquids having specific gravities above 2.0 is limited. Ethylene bromide, bromoform, tetrabromomethane, and methylene iodide will be found particularly useful. Mixtures of ethylene bromide with tetrabromoethane or methylene iodide and of alpha chlornaphthalene with methylene iodide will cover the specific gravity range around quartz and the feldspars, which frequently must be removed in order to study minor constituents. The stability of these mixtures has not been investigated.

The foregoing technique will be found especially useful in conjunction with the Donnay grids<sup>1</sup> where even a determination of properties within wide limits may help in tracing an unknown.

#### DIRECT DETERMINATION OF INTERPLANAR SPACING FROM X-RAY PATTERNS RECORDED ON CHARTS

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The use of the recording x-ray spectrometer which produces powder diffraction patterns on a strip-chart is greatly facilitated by preparing a calibration curve for reading interplanar spacing directly from the recorded pattern. The writer has learned recently that several laboratories in which recording x-ray spectrometers are used do not use these calibration curves so that it seems worthwhile to present a brief description of the procedure which has been applied for the past two years at this laboratory.

<sup>1</sup> A small set of grids for the determination of non-opaque minerals: *Am. Mineral.*, **23**, 91-100 (1938).