particular rock or the ratio between two components was not exactly known; for example, in a group of carbonate rocks with calcite, dolomite, clayey material and quartz/feldspar as components, dolomite was not present in all samples.

A disadvantage of plotting four and more components is that a diagram becomes difficult to use if many lines lie close to each other, hence, it is important to choose as the vertical component that which shows the greatest variation among the systems being graphically compared.

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A NEW TECHNIQUE IN CENTRIFUGAL MINERAL SEPARATION

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Introduction

The following is a description of an improved tube to give a rapid and efficient separation of sink and float products in the heavy mineral separation using bromoform and a centrifuge. This method is particularly applicable to very fine grained minerals and mineral powders. The main drawback to the use of the centrifuge has been the separation of the light and heavy fractions without contaminating one with the other. The apparatus described below gives a quick and clean separation of these two fractions.

Description and Use of the Apparatus

The apparatus, shown in Fig. 1, consists of three parts; the outer tube (A) which is a standard 15 ml. capacity centrifuge tube, the inner separation tube (B), and the rubber stopper (C).

The inner separation tube fits closely into the outer tube and is supported by a lip at its upper end. The inner tube tapers gently to a constriction, not exceeding $\frac{1}{8}$ of an inch in diameter, in the lower part

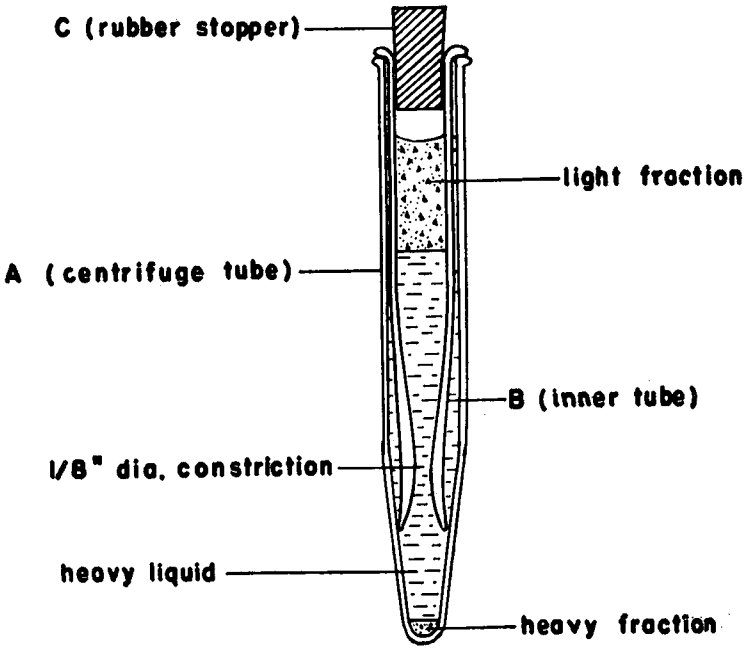

Figure 1.

of the tube. Below the constriction the bottom end of the tube is flared outward to a diameter that is slightly less than that of the outer tube. The gentle flaring of the upper part of the tube prevents particles from sticking to the tube. The flaring at the bottom end permits light particles that are trapped and carried down by the heavy minerals to be funnelled upward through the constriction to the top of the heavy-liquid. The rubber stopper should fit tightly into the inner tube.

The surface tension of the heavy-liquid and its relation to the size of the constriction is the principle by which the separation is effected. The column of heavy liquid can be supported in the inner tube when the rubber stopper is tightly in place provided the constriction is not beyond the critical diameter of $\frac{1}{8}$ inch. When the stoppered inner tube is withdrawn, the light fraction and the bromoform above the constriction remain in place; the heavy fraction is left in a small amount of bromoform at the base of the outer centrifuge tube.

To make a separation, the parts are assembled as shown in Fig. 1,

the bromoform is poured in, followed by the sample material. While dispersing the sample in the inner tube with a thin glass rod, care must be taken not to contaminate the outer tube. The material is then centrifuged for a specified time. High velocity centrifuging will release most of the heavy grains that have adhered to the tapered walls of the inner tube. After centrifuging, the rubber stopper is pressed tightly into the inner tube which is then withdrawn from the outer tube and both fractions filtered and washed.

The inner tubes are easily made from glass tubing. A limit of 3 grams of sample material can be handled with the standard 15 ml. centrifuge tubes; for larger amounts inner tubes to fit 50 ml. centrifuge tubes have proved to be equally satisfactory.

The above is a different technique for the separation of heavy minerals than those described in the following references by Nickel and Haseman.

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BRANNERITE FROM EASTERN ONTARIO

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In the summer of 1956 a party of prospectors, known as the Bob Sypal group, found a showing of radioactive mineral. Specimens were submitted to the writer and identified as brannerite. Recently brannerite was described from California (Pabst, *Am. Mineral.* **39**, 109–117, 1954) and from Blind River, Ontario (Nuffield, *Am. Mineral.* **39**, 520–522, 1954) bringing the reported localities to six. A brief description of the new occurrence is warranted because it differs from those best known.

In Lot 18, Con. C, South Sherbrooke Twp., Ontario, the Canadian Pacific Railway traverses a rock cut 500 ft. in length on the north side of Christie Lake. The showing is located near the center of the east side of this cut at track level. Specimens were collected by the writer.

Sedimentary and derived metamorphic rocks of Precambrian age constitute most of the outcrops in the area. Several small lenses of