the same optical refractive index as the porous material. Hence, when the porous material is saturated with the liquid, the mixture is transparent and the solid and liquid are indistinguishable from one another. When the liquid is withdrawn, the exact manner in which the air replaces the liquid becomes observable. This is possible because the air has a different refractive index than the mixture. Although several suitable combinations of liquids and porous materials are available, a mixture of crushed Pyrex glass and aqueous ZnCl\(_2\) solution has proven satisfactory. In the figures to be presented, the crushed glass had an average particle diameter of 1-mm, and the ZnCl\(_2\) solution was approximately 63% by weight. Because the refractive indices are temperature dependent, small adjustments in solution concentrations may be necessary for prevailing laboratory conditions. The deliquescent nature of the ZnCl\(_2\) solution requires that it be enclosed if the model is to be used over an extended period of time.

Figure 1 is a photograph of a container 33 cm. high, 15 cm. wide and 2 cm. thick constructed from 0.3-cm. lucite sheeting. Containers having a thickness of 15 cm. have been used successfully. The reservoir for the solution is connected to the model through a perforated plate. Raising and lowering the reservoir adds and removes liquid from the model. The left-hand photograph in figure 1 shows a meter stick behind the model which is filled with crushed glass saturated with ZnCl\(_2\) solution to a depth of 17 cm. The right-hand photograph is the same except that air has entered at the upper surface of the crushed glass.

A closeup view of the air entering at the surface of the saturated crushed glass is given in figure 2. The manner in which the air enters is illustrated in the photograph. The jerky, irregular movement of the liquid-air interfaces can be observed in the closeup photograph of the model. The empty and fill in the same manner, which allows students to realize problems of hysteresis. It is believed that this model makes soil water movement more meaningful to students when one progresses from grossly simplified capillary models to more realistic descriptions occurring in nature.—J. M. DAVIDSON, J. W. BIGGAR AND D. R. NIELSEN, Irrigation Department, University of California, Davis.

A FRACTIONATOR FOR SILT

In the course of petrographic and X-ray investigations, the authors have developed a simple mechanical fractionator for separating silt-size materials from soils, and separating fractions within the silt-size range. The method of siphoning or decantation generally used for making these fractionations is not accurate enough for many kinds of investigations, especially in the coarse silt range.

The fractionator described here consists of a fractionation cylinder fitted on a movable base and the suspension after a given time. The cylinder is moved laterally, shearing the sedimenting column and thereby making an almost undisturbed separation of different size particles in the column. The cylinder (figure 1) consists of a 2-inch O.D. plexiglas tube mounted on a 1/4 by 4 by 9 inch plexiglas slide, which is fitted into a grooved base of plexiglas. Pressure of the slide on a TS inch neoprene insert to prevent leaking is controlled by ten %-inch plastic screws. Fractionation is accomplished by filling the cylinder to 15 cm. above the slide-base interface and then allowing the suspension to settle for a given time. The fractionator described here is a valuable addition to the classroom laboratory.