A Study of the Supposed Suction Effect of Quicksand

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It would seem a sheer waste of time to study a supposed suction effect of quicksand in view of the evidence brought out in the preceding paper on "The Influence of Coarseness of Grain on the Lifting Effect of Quicksand." Yet even in the presence of data indicating a lifting effect equal to the buoyancy of liquids with a specific gravity of 1.156 to 1.7, still the question arises in the minds of certain geologists—Will not hollows in the human body and in clothing of victims develop such a partial vacuum as to make it relatively difficult to escape from quicksand once a person or other animal is engulfed? Experience with a large

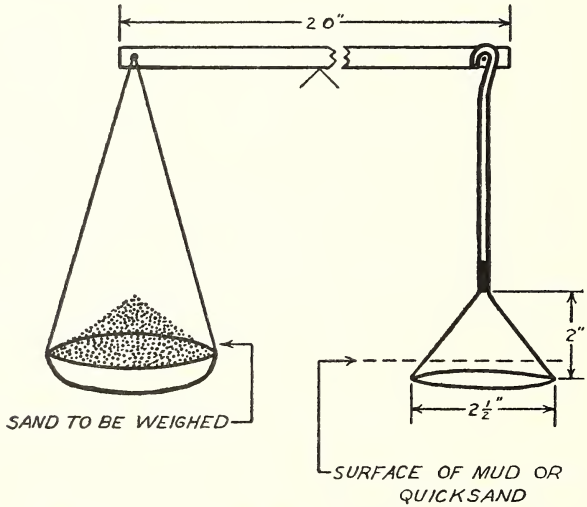

Fig. 1. Apparatus for Comparison of the "Suction Effect" of Mud and Quicksand.

crystal of garnet without such hollows was considered to be indecisive, although it could be extricated so much more easily from sand, made "quick" by rising currents, than from the same sand, merely damp.

To study the influence of such points of partial vacuum the device as depicted in figure 1 was constructed. The inverted funnel on the right, after the opening at the top of the funnel had been fused tightly, was partially immersed in a sticky clay mud and in the two quicksands discussed in the previous paper. At the beginning of each test, the beam was placed on the fulcrum so that the beam was horizontal. Then

sand was poured slowly into the pan until the funnel was pulled out of the immersing material. The amount of sand required was then weighed to give an indication of the suction effect of the immersing material, clay mud or various coarsenesses of quicksand. The average required weight of sand to lift the funnel from the mud was 152.7 gms. There is possibly some variation due to variability of viscosity of the mud which would lose some water due to evaporation in the drier-than-Yuma atmosphere of the laboratory. The amount of sand required to draw the funnel from the fine quicksand was but 16.5 gms., average of three tests. With the coarse quicksand, the lifting effect was so great that the bar could not even be set horizontal.

As a result of these studies, the writer believes that there is no suction effect in quicksand comparable to that in mud, and that the coarser the quicksand the less the so-called suction effect.