

An Improved Sediment Sample Splitter

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Introduction

It is very essential to obtain a convenient subsample of the representative material to conduct certain types of analyses such as grain size distribution, microfaunal assemblages and chemical analyses of the sediment.

In order to represent the bulk and to safeguard against error in selection, the field samples have to be subjected to coning and quartering to obtain the desired quantity for analyses. This splitting may be accomplished in several ways.

An adaptation of hand quartering was made by Pettijohn (1931), using four rectangular sheets of smooth paper, placed together in such a way that each overlaps one half of the other to form a square. The material to be splitted is poured carefully into the centre of this square and flattened out into a circle. The pieces of paper are then pulled apart. Opposite quarters are recombined and the process repeated until the desired quantity is obtained.

In the year 1933 Krumbein experimented with a common splitting device, which consists of a conical hopper, whose opening at the tip is centered over the intersection of two knife edges set at right angles to each other. The

sample is thus split into four approximately equal divisions.

Apart from these two methods, Jones splitter is the most widely used one, consisting of a series of inclined chutes leading alternately two pans placed on opposite sides of the apparatus. The material to be split is poured into a hopper using a rectangular pan, the width of which is equal to the width of the set of chutes. In the commercial model of the Jones splitter, Wentworth (1927) showed that the error was greater with the larger sizes.

Otto (1933) designed and built a miniature Jones sample splitter.

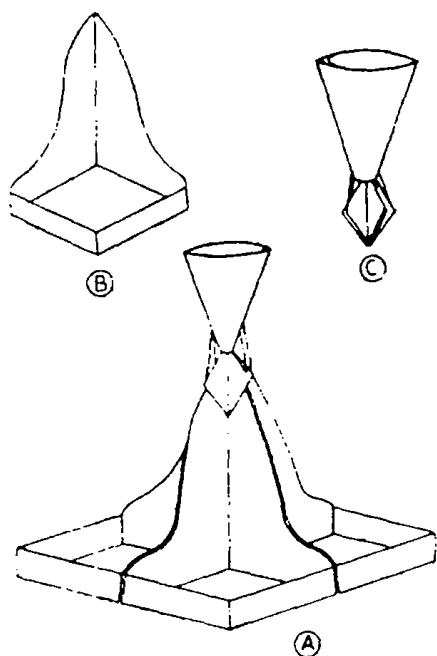
Later, Appel developed a still better type of device for sample splitting, consisting of an oscillatory funnel driven by a crank attached to a small induction coil.

Wentworth *et al.* (1934) designed a rotary type of small splitter which showed a marked improvement over the others.

Of all these splitters designed, the type of sample splitter to be described now seems to be the best. (Fig. 1).

This splitter is very simple, economical and saves time and labour. Its percentage of error is almost negligible.

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The splitter consists of a funnel and four pans (Fig. A), designed in such a way that the funnel is welded to the edges of the four angular ridges that are formed, within which the adjacent sides of the pans fit in elegantly, thus avoiding spilling while the splitter is in operation.

The maximum and minimum diameters of the openings in the funnel are 4" and $\frac{3}{4}$ " on the upper and lower sides respectively (Fig. C). The height of each pan is 9" with an area of 36 sq. inches (Fig. B).

The functional efficiency of the Instrument has been tested by repeatedly splitting the same sample of the known quantity, a number of times. The results obtained are given in table 1.

TABLE I

A	B	C	D
25	25	24.5	25.3
25.2	25.1	24.0	25.5
25.1	25	24.6	25.2
25	25.1	24.5	25.3
25	25	24.4	25.5
25	25	24.6	25.3
25.2	25	24.6	25
25.2	25	24.4	25.2
25.2	25.1	24.3	25.2
25	25	24.5	25.3

It can be seen from the table that the splitting is effective and does not show significant variation during different operations.

On the same principle, micro-splitters can also be prepared, the larger ones for cutting down samples for assaying and chemical analyses, and smaller ones for quantitative microscopic work.

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