

## Spontaneous Studies of Soils. I.

### A method for collecting the soil samples to be studied in the laboratory.

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#### Introduction:

It has been a great handicap for the soil investigation in general especially in the biological research that the soil samples thus far used are far removed and disturbed from the natural state so that the results obtained by the usual methods may differ greatly from that existing in nature.

Although it is almost impossible to provide exactly the same ecological conditions in the laboratory as those found in the nature, it is attempted to retain the natural state as much as possible in collecting the samples and to carry on the experiments. To attain the object, the following method is proposed, as described in detail below.

#### A proposed method:

The method consists of taking a soil monolith of a small size in a similar manner which is adopted in the soil profile investigation, as described in detail and shown in the figure and photographs below:

##### A.) Apparatus used:

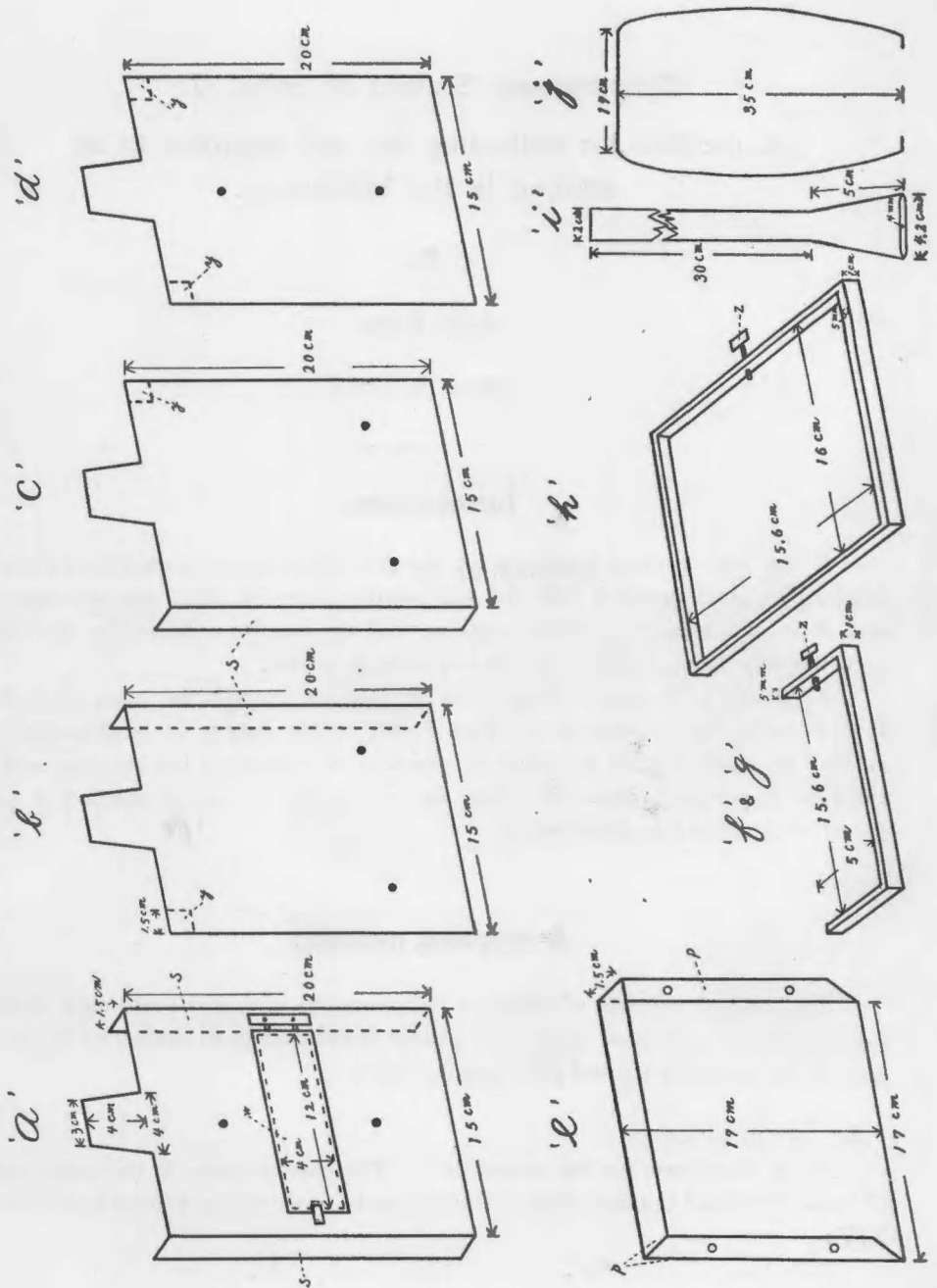
1.) A brass case for the monolith:— The case is made of the brass plate of 3 mm. thick and consists of the following parts, as shown in Figure I and Plate XIV:

'a'.	'b'.	'c'.	'd'.	'e'.
'f'.	'g'.	'h'.	'i'.	'j'.

##### Description of the parts:

Part 'a',— a sheet of brass 3 mm. thick, 15×20 cm. square with a projection in the center of the top and of which 1.5 cm. of the longer edges (s) are turned at

Figure I.  
Diagram showing the construction of the brass case.



right angle and the lower edge is sharpened; at w, a window (4×12 cm.) with door is provided so that the samples may be taken out from time to time; two projections are placed to hold up the frame 'f' and 'h'.

Part 'b' and 'c',—these two parts form the left and right side and are the same sized brass plate, 15×20 cm. with one hook (Y) placed on one side of the upper edge and the other side is sleeved, and the lower edge is sharpened as in case of 'a'; two projections are placed at the lower part to hold up the frame 'f' and 'g'.

Part 'd',—the same as 'a' without the window and the sleeves but having a hook at each upper corner.

Part 'e',—the bottom brass plate is 17 cm. square banked (p) on three sides, 1.5 cm. high, and a side without the bank is sharpened; two small holes are provided on each side bank through which the handles can be fixed.

Part 'f' and 'g',—brass frame with a screw (z) at one short arm.

Part 'h',—a square brass frame with a screw.

Part 'i',—a handle.

Part 'j',—two wire holders.

Besides these parts described above, a well sharpened straight spade and a large and broad knife are used.

#### B.) *Procedure for taking the samples :*

If the soil is soft, push down 'a' by means of the handle squarely into the soil and gently take away the soil next to 'a' by means of the spade; if the soil is hard, make a hole in the soil by the spade, about 30 cm. deep and 40 cm. square and clean up a wall with the knife, and place 'a' against a smooth wall. Then place 'b' and 'c' in turn on both sides of 'a', either by pushing down directly or after digging with the spade a short distance away along the outside. Next brace up 'a', 'b' and 'c' with 'f' just above the projection. Then place 'd' to complete the case either by directly pushing down or after digging with the spade; brace on 'd' side with 'g' and place 'h' which is tightened by means of the screw. Finally clear away a part of soil at the base by means of the knife or spade, and place 'e' carefully so that it makes the base for the block; then place the holders 'j' through the holes of 'e' so that the block can be carried into the laboratory easily, and placed in an incubator, if so desired. The samples for tests are taken out thru the opening at 'w', at desired intervals by means of a small sampling tube, or such test as the Cholodny method can be applied. At the sametime, the other tests such as temperature measurements, the direct pH determination etc., can be made directly from time to time.

### Summary.

By this method, a sample of the surface soil to the sufficient depth for a majority of the arable soils, can be obtained and investigated in the laboratory under very close conditions to the natural state.

Fig. 1.  
Complete Case.

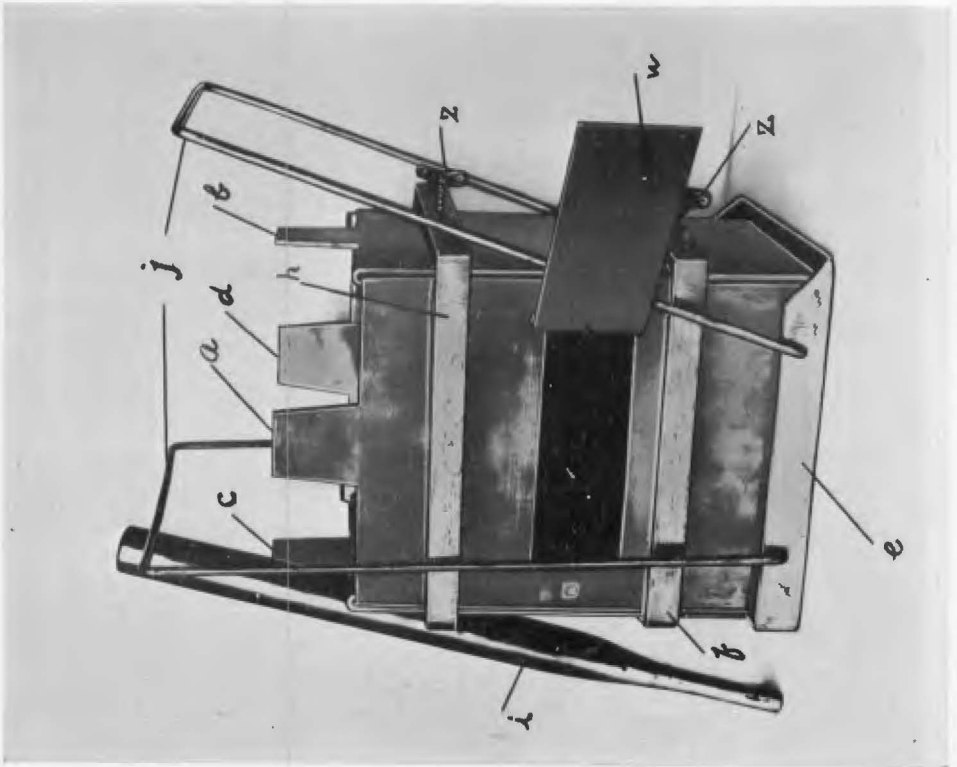


Fig. 2

Soil monolith after the casing is removed.

