This is the pedological definition of soil structure.

Soil is a porous body. There will be voids both within and between the structural aggregates. These voids govern infiltration, permeability, drainage, aeration and availability of water to plants. They are of paramount edaphic importance. When the edaphologist uses the term 'soil structure' he is commonly referring to the nature of the voids rather than to the nature of the peds or aggregates. Thus the term 'soil structure' is used for two very different properties.

To the pedologist, a well-structured soil has well-developed peds; to the edaphologist, a well-structured soil exhibits suitable size, distribution and stability of voids.

The edaphologist associates three soil characteristics with soil structure, none of them identical with the pedological definition. Furthermore, it is wrong to assume that aggregation is identified with suitable void characteristics. A structureless soil, one composed of single-grain particles, may have a very favourable void distribution and, in this sense, would be well structured. On the other hand, there is no known means of assessing void distribution in terms of aggregate size distribution.

It is proposed that the term 'soil structure' be confined to the present usage by pedologists. It should describe the size, shape and arrangement of the peds in the soil.

It is further proposed that the term 'void structure' be used when reference is made to the nature of the voids. The term 'void structure' is defined as the amount and size distribution of the soil voids.

The inclusion of the word 'void' is intended to direct attention to the soil property being examined, to prevent identification of void arrangement with aggregation and to prevent soils described as structureless being necessarily condemned by the agriculturist.

The word 'structure' is retained because it means 'way parts are put together'. When qualified by the adjective 'void', confusion is removed, and acceptance into soil nomenclature should be made easy.

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MISCELLANEOUS

Conical Paper Chromatography

THE need to scan chromatographically the composition of natural oils and bacteriostatic extracts from rocks under precisely similar solvent-extraction conditions has led to the use of filter papers folded into cones. Many other fields of research require similar conditions, and it is suggested that this type of paper chromatography may have wider applications. From Fig. 1 it will be seen how simple is the equipment needed for this technique. Moreover, the apparatus enables one to obtain a solvent-saturated atmosphere very rapidly and even to work at reduced pressures. As a result of this the developing solvent rises rapidly, and at a remarkably uniform rate, so that the ingredients separate effectively into ever-narrowing zones as they ascend towards the apex of the cone (Fig. 2). These features of the technique have also proved particularly useful in concentrating antibacterial ingredients extracted from coal. The ever-narrowing front of the ascending column of ingredients results in the development of highly concentrated zones of the bacteriostatic substances, collectively known as 'vitricin'[1].

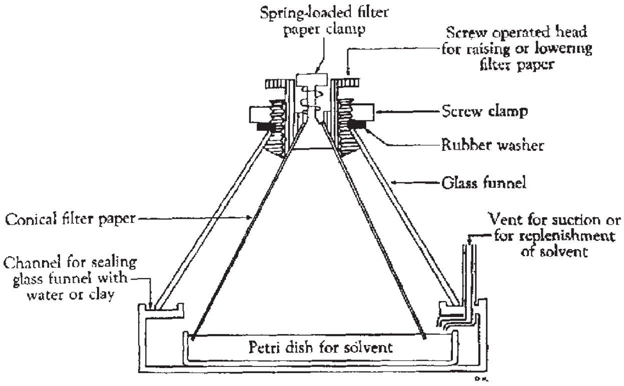

Fig. 1

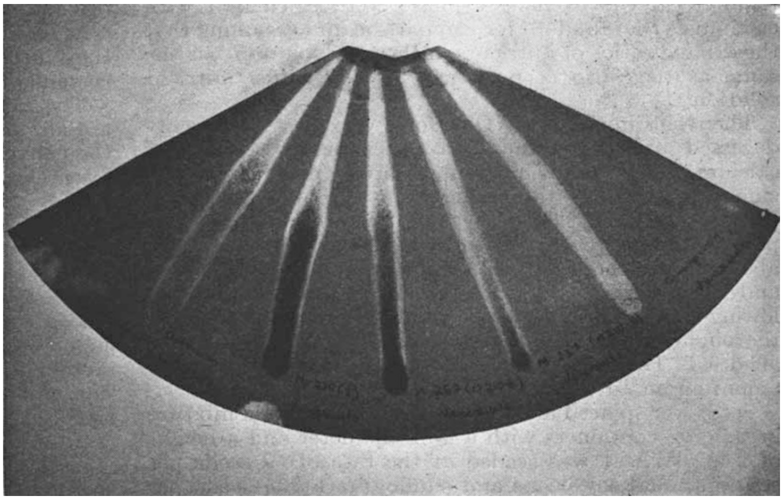

Fig. 2. Five natural oils from Ecuador and Venezuela illustrating the fluorescence of their ingredients separated by acetone. The initial 'spots' were made four times larger than usual to illustrate the linear nature of the ascending chromatograms under extreme conditions

The apparatus, as shown in Fig. 1, was constructed from a sawn-off cone of a glass filter funnel, to the top of which was attached a spring-load clamp to hold the paper cone. The glass funnel rests in a channel forming the rim of a metal dish. This enables the conical chamber to be made air-tight by filling it with water or by a layer of 'Plasticine'. A Petri dish was placed inside to hold the developing solvents, into which the paper is lowered by turning the screw inserted into the clamping device. As many as 15 oil samples have been extracted on one semicircle of Whatman No. 1 paper of 24 cm diameter folded into a cone. In the example shown in Fig. 2, the initial spots were deliberately overloaded to illustrate the effect of the reduced pressures and saturation of the atmosphere. From these it will be seen that the paraffinic and aromatic ingredients of the oils have separated to a much greater extent than is usually found when using strips or sheets of paper. Another aspect of this type of conical paper chromatography which is being developed is the scanning of such papers for absorption and fluorescence properties of the substances. The ability to follow the path of a great circle from each chromatogram to another separated by clear zones of paper which have been subjected to the same degree of solvent alteration removes one of the main obstacles to this type of instrumentation.

It is also proposed to modify this equipment to take advantage of thin film chromatographic separations.

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[1] Evans, W. D., *Trans. Inst. Min. Metall.*, 65, 13 (1955).