uteri were prepared, the myometrium was dissected and the antimesometrial decidua was cut out. After removing the adhering blood the tissue was cut into small pieces which were suspended in 0·00075 *M* 8-oxychinoline solution for 1 hr. The tissue was then fixed for 3 hr. in ethanol–acetic acid, 3 : 1, and afterwards preserved in 70 per cent ethanol. For further preparation these pieces of tissue were stained for 30 min. in carmine–acetic acid containing 10 per cent glycerol[5]. Then they were picked with needles into tiny pieces and squashed under a cover-glass. The chromosomes were counted by means of a phase-contrast microscope at 2,000- or 3,000-fold magnification. Only metaphase plates were examined. Each mitosis was counted independently by two persons. In each group the chromosomes in 500 mitoses were counted. The numbers we found were classified as to the degree of ploidy. The haploid set of chromosomes was : $n = 21$. The limits of these degrees of ploidy were fixed as : $n \pm 10$, $2n \pm 10$, $3n \pm 10$ . . . . In total, 1,500 metaphases were counted in the antimesometrial part of the rat deciduomata. The results of these counts are demonstrated in Fig. 1.

From this it may be concluded that in the spleen there exists a polyploidizing substance, the chemical nature of which is not yet known.

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[1] Rigler, R., and Rosenkranz, W., *Z. Naturforsch.* **13**, b, 291 (1958).
[2] Rigler, R., and Rosenkranz, W., *Wien. klin. Wschr.*, **69**, 445 (1957).
[3] Rosenkranz, W., and Rigler, R., *Z. ges. exp. Med.*, **129**, 627 (1958).
[4] Rigler, R., and Rosenkranz, W., *Z. Naturforsch.*, **13**, b, 543 (1958).
[5] Marquardt, H., and Gläss, E., *Chromosoma*, **8**, 617 (1957).

SOIL SCIENCE

C Horizon of the Soil Profile

In the course of recent investigations on the pedology of fluvial soils located in the area of Durham City, no true *C* horizon could be observed in the numerous profiles and sections examined. In the case of so-called transported soils, it is, of course, well known that the *D* horizon will usually be unrelated to the solum. But the finding that the *C* horizon is absent in some of these soils is of pedological importance, and, so far as we are aware, has not previously been reported for soils of the United Kingdom. Nevertheless, the occurrence of soil profiles of this type would seem to be of more than local significance and may well be widespread.

The area under study formed part of the floor of a large glacial lake, which came into existence towards the end of the Pleistocene epoch, when varying thicknesses of fluvioglacial deposits were laid down. These deposits, which are often lenticular, are both heterogeneous and variable, particularly in texture, structure, colour, depth and drainage ; they show clear evidence of water-sorting in the morphology of the profiles and sections.

The alluvial soils studied are located in an old flood plain of the River Wear and thus represent the results of the resorting and deposition by the action of water on the glacial and fluvioglacial deposits left after the retreat of the ice. They are therefore of similar mineral content to the local fluvioglacial deposits. These deposits are also extremely heterogeneous.

In general, the study of the profiles and sections of both fluvioglacial and alluvial soils revealed two distinct horizons—a zone of eluviation and a zone of illuviation ; but it was not possible to distinguish a true *C* horizon although the investigation extended to Carboniferous age bedrock (shale) encountered between 19 and 24 ft. The *C* horizon is by definition the unconsolidated parent material substantially similar to that from which the solum has developed. Before such a horizon can be identified there must be evidence of this similarity, and this is not apparent in the profiles and sections studied. In these soils the parent material of the upper layer of the soil profile has been completely transformed into the *A* horizon. Probably it was different from the parent material of the *B* horizon and was not necessarily identical with any mineral material that can now be observed in the regolith. The relationship between the different soil horizons is dependent on pedological processes acting on parent material horizontally bedded and initially heterogeneous. The horizons below the zone of illuviation must be regarded as *D* horizons, because any unconsolidated material beneath the solum not characterized as parent material is so designated[1]. In these soils the succession of horizons is therefore *A,B,D*.

It will be seen that the absence of a *C* horizon is, in effect, the result of one or more relatively thin layers of transported material originally constituting the upper zone of the deposits. A parallel case of interest has been recorded in the United States in regard to certain deposits of loess only 30 in. deep[2]. It is known that the *C* horizon may also be absent in the profile of soils developed *in situ* where the parent material is sufficiently resistant to weathering to result in the rate of formation of the solum keeping pace with the rate of rock weathering.

A further relevant experience has recently been encountered in an investigation of types of rendzina profiles developed on the magnesian limestone of Co. Durham. Glacial till was found to overlie the bedrock in some of the profiles studied. In cases where the layer of till was thin the typical rendzina profile was developed, but the *A* horizon has been formed from varying proportions of both till and the residues remaining from the weathering of magnesian limestone. In many cases the effective contribution of till is sufficiently great to preclude the underlying weathering magnesian limestone from being classified as parent material. In the case of these soils, the succession of horizons is therefore *A,D*.

It is hoped shortly to present elsewhere detailed reports of all these investigations.

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[1] Lyon, T. L., Buckman, H. O., and Brady, N. C., "The Nature and Properties of Soils", fifth ed., 327 (Macmillan Co., New York, 1952).
[2] Thompson, L. M., "Soils and Soil Fertility", second ed., 127 (McGraw-Hill, New York, Toronto and London, 1957).