2. Soil Terminology

The James Hutton Institute

Soils represent a dynamic part of our natural environment with many inter-linked chemical, physical and biological processes acting either together or consecutively to create a distinctive soil profile. Some common soil processes include;

1. **Capillary action:** Where evaporation exceeds precipitation, moisture moves upwards within the soil profile by capillary action. It is therefore in the reverse direction to leaching.

2. **Decomposition:** Breakdown of plant derived material into its simpler organic constituents. (posters 1, 2 & 3)

3. **Humification:** The breakdown or decomposition of plant remains leading to the formation of different types of humus. MOR humus usually develops beneath coniferous woodland or acid heather moorland under cool, wet climatic conditions, where breakdown is slow due to the absence of soil fauna. MULL humus develops under deciduous woodland where base-rich plant remains are actively broken down by a prolific soil fauna, including earthworms that ingest material and mix organic and mineral matter. MODER humus is intermediate between mor and mull. (posters 1, 2 & 3)

4. **Leaching:** Wherever rainfall exceeds evaporation and there is free downward movement of water through the soil pore system, soluble products of weathering are leached or removed from the soil profile. Continual leaching tends to impoverish the upper mineral horizons by removal of basic cations. Leaching is most active in sandy soils with high porosity and is least in fine-textured soils with restricted pore space. (poster 4)

5. **Translocation:** The movement of material in solution or suspension from one horizon to another is referred to as translocation. The horizon losing the material is the ELUVIAL or E horizon, and the horizon gaining the material is the ILLUVIAL horizon (often a subsoil or B horizon). The E horizon near the surface of a podzol is a good example of an eluvial horizon. (posters 1, 3 & 4)

6. **Weathering:** This refers to the breakdown and decomposition of rocks by factors including air, water, sun and frost. Physical weathering involves continual breakdown of rocks into smaller and smaller particles while chemical weathering involves alteration of the chemical composition of rock minerals.

OTHER SOIL FEATURES INCLUDE:

Soil colour: Soil colour is related in part to soil drainage, with free draining well AERATED soils (with pore space dominated by oxygen) having rich brown colours (see photographs of podzols and brown earths) (posters 3+4). In contrast, poorly draining soils, often referred to as gleys, develop under ANAER-OBIC conditions (the pore space dominated by water) and have grey or blue-grey colours. Soils with periodic waterlogging are imperfectly drained and are often highly mottled with blotches of colour different from the predominant soil colour. MOTTLES are often rusty (orange) in colour and are due to iron concentration. (see photograph on poster 5)

Soil texture: Term used to designate the distribution of the different sizes of mineral particles in a soil. These particles vary in size from those visible with the naked eye (sand), to those requiring a microscope (silt or clay). (poster 2)

Soil clod on right is compact due to continual traffic, blue-grey in colour due to reducing conditions and poor environment for root development. Soil clod on left is relatively loose, ample pore space for good, healthy root development.

Thin section through soil showing small soil peds or crumbs with high porosity leading to free drainage and active leaching.

Soil high in **silt** and **clay** with compact subsoil lacking in pore space, relatively poor environment for root development.

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