

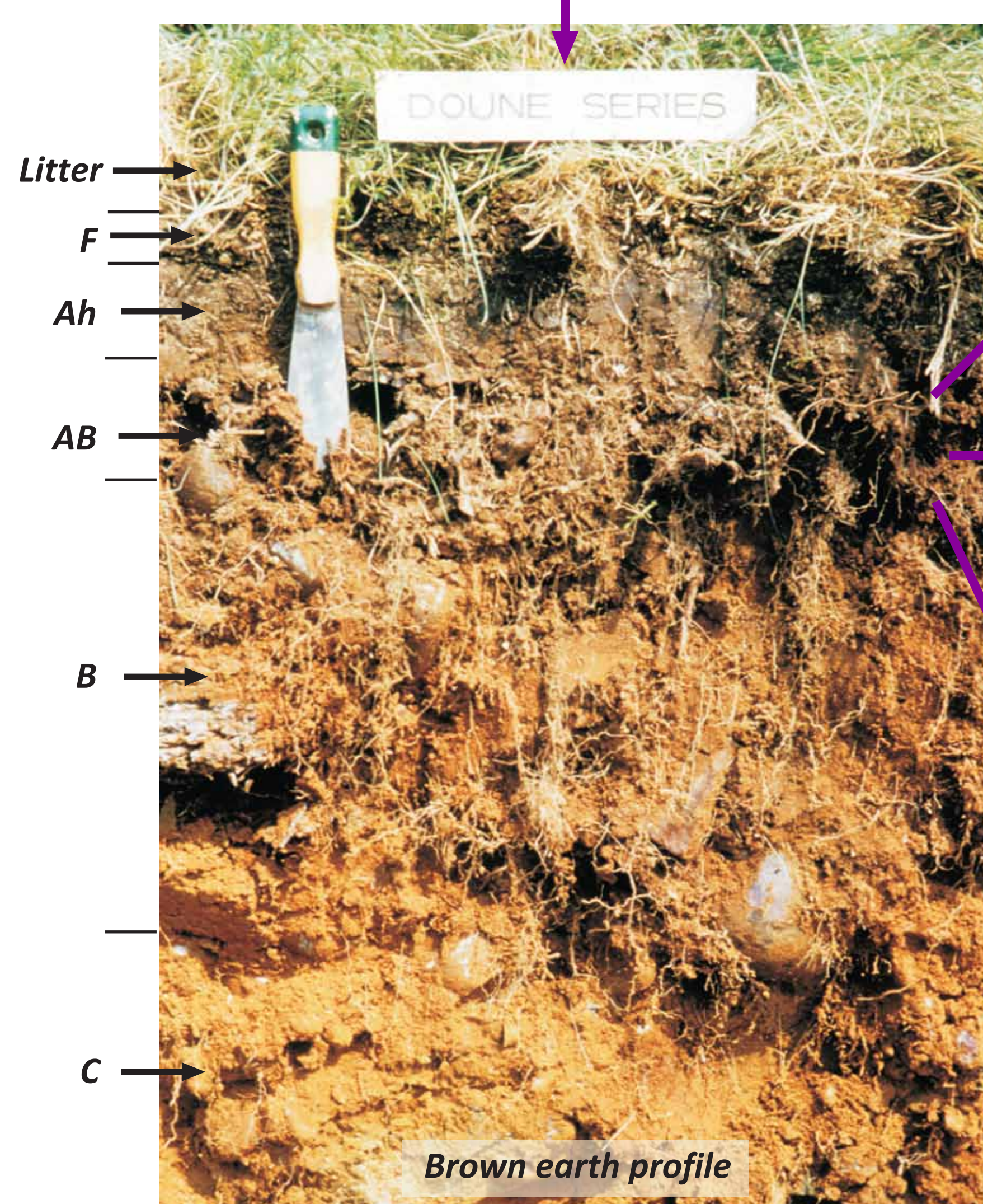
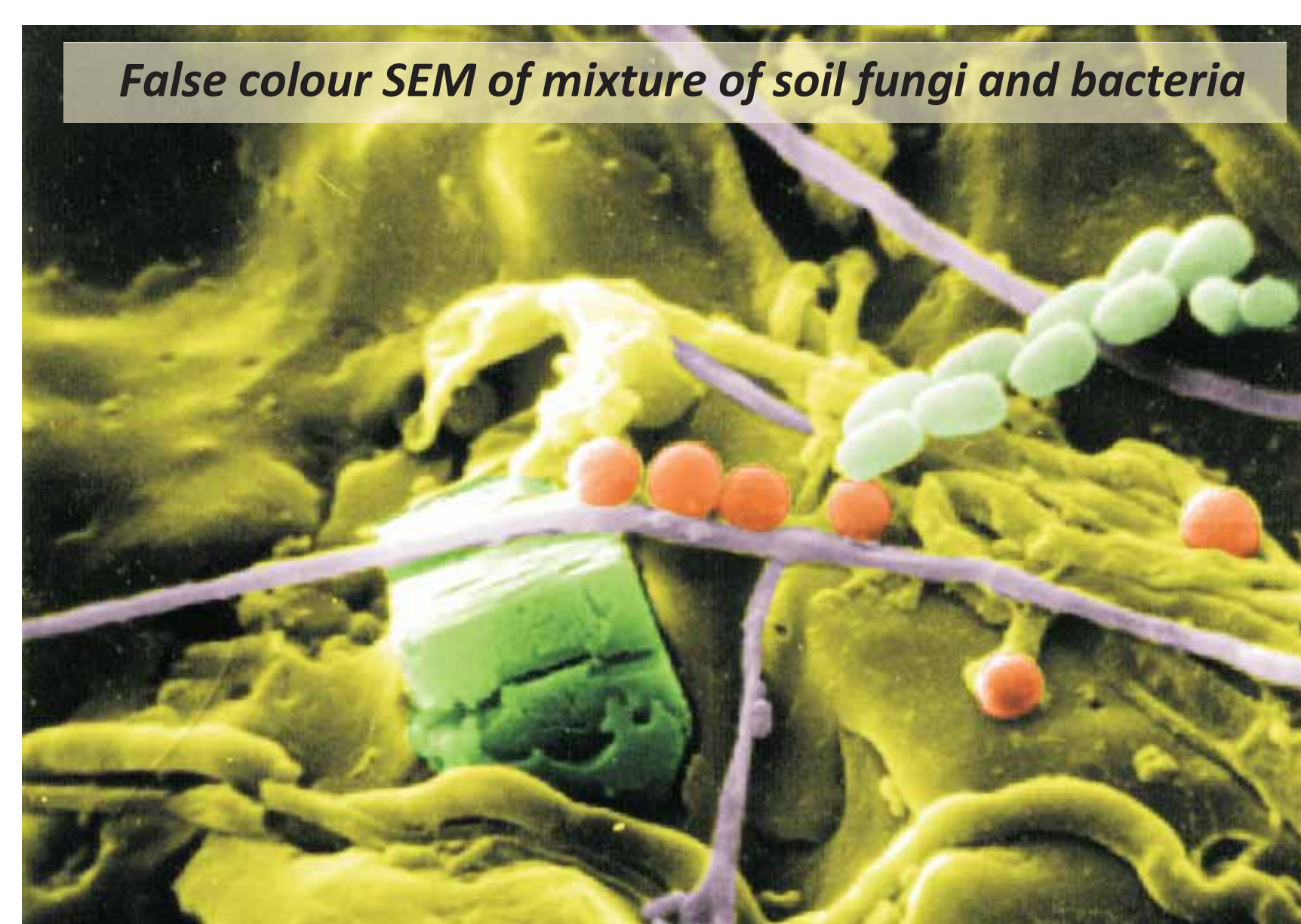
2. Brown Earths

J H Gauld and L A Dawson
The James Hutton Institute
Email: lorna.dawson@hutton.ac.uk

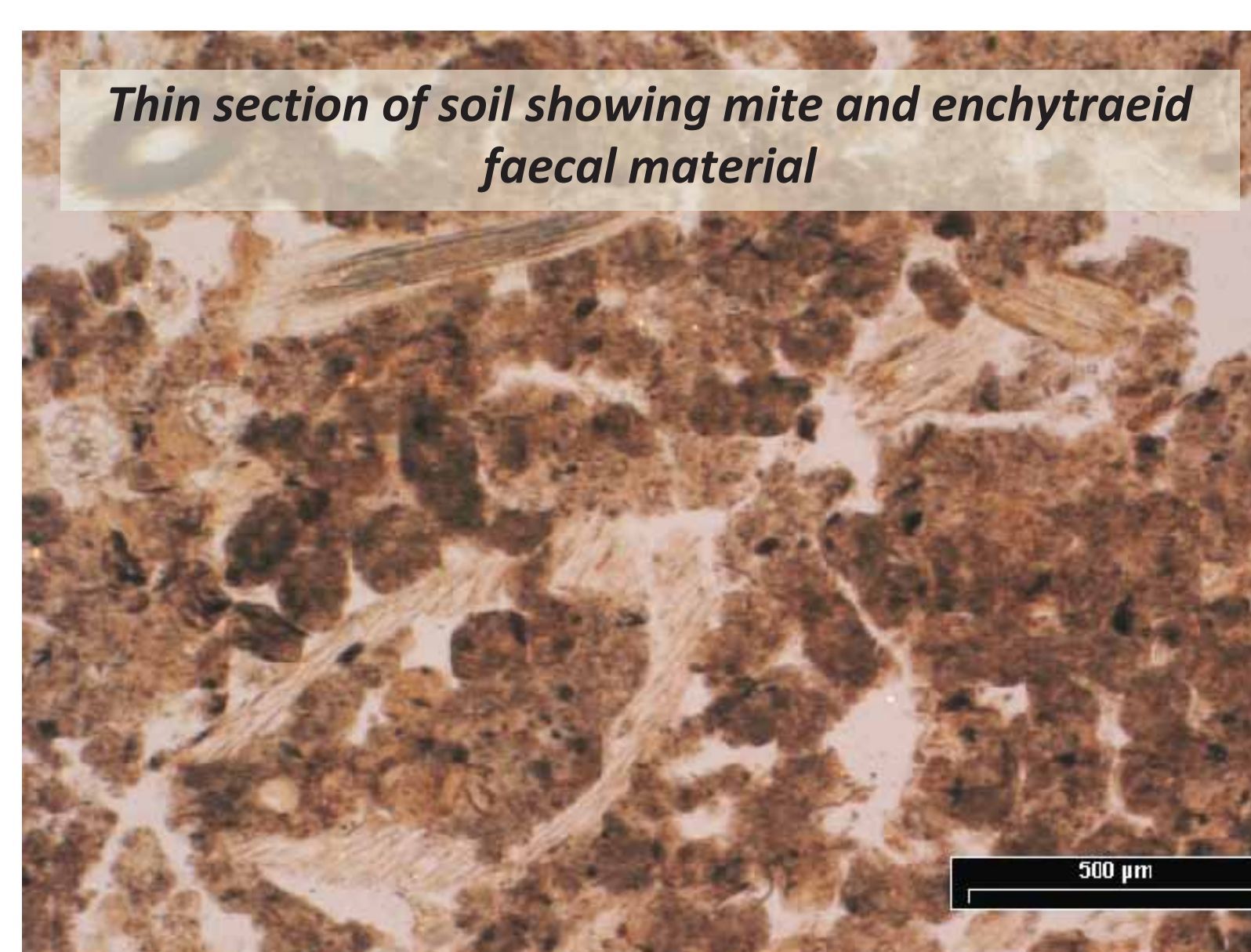
General characteristics: The general term 'brown earth', denotes an extensive grouping of soils, generally **free draining**, with altered subsoil horizons, usually brown or reddish brown, in which iron oxides are bonded to silicate clays. Under natural conditions of broadleaf forest a litter rich in nutrients and organic matter is generated and with intense biological activity, the litter is rapidly **decomposed** prior to incorporation into the mineral topsoil by earthworms. The earthworms drag material into their burrows from the surface and ingest a mixture of mineral and organic material to create **mull humus**. A dark-coloured surface Ah horizon (h denotes enriched with humus), of variable depth, overlies subsoil horizons (B horizons) with distinctive **brown colours**, the main feature being a gradual lightening in colour as the organic matter and iron content decreases with depth.

SOIL FORMING FACTORS

PARENT MATERIAL	Neither extremely calcareous nor extremely acidic; variable soil texture .
VEGETATION/ORGANISMS	Broadleaf woodland; grassland and arable sites; rapid breakdown of litter by organisms and incorporation by earthworm activity to create mull humus and indistinct surface horizons.
CLIMATE	Relatively warm, dry climate.
TOPOGRAPHY	Generally low-lying, undulating terrain.
TIME	Since end of last Ice Age, circa 10,000 years.



ORGANIC MATTER BREAKDOWN



Uses: Given their adequate depth, **free drainage** and relatively high natural nutrient levels, these soils are amongst the most fertile in Scotland and are used extensively for agriculture, some of which is intensive and specialised, for example winter vegetable production. However, fertilisers are still required to maintain nutrient levels. By virtue of their occurrence in favourable climatic areas and on flat or gently undulating terrain they have also been used extensively for settlement and industry. Significant growth rates of trees can be obtained within sheltered sites.