

The background of the entire image is a close-up photograph of parched, cracked soil. The soil is a rich brown color, and the cracks form a complex, irregular pattern across the surface. Some small, dry leaves and twigs are scattered throughout the soil.

**OUR**

**TIME**

**ON**

**EARTH**

**Soil Universe**

# New Vocabulary

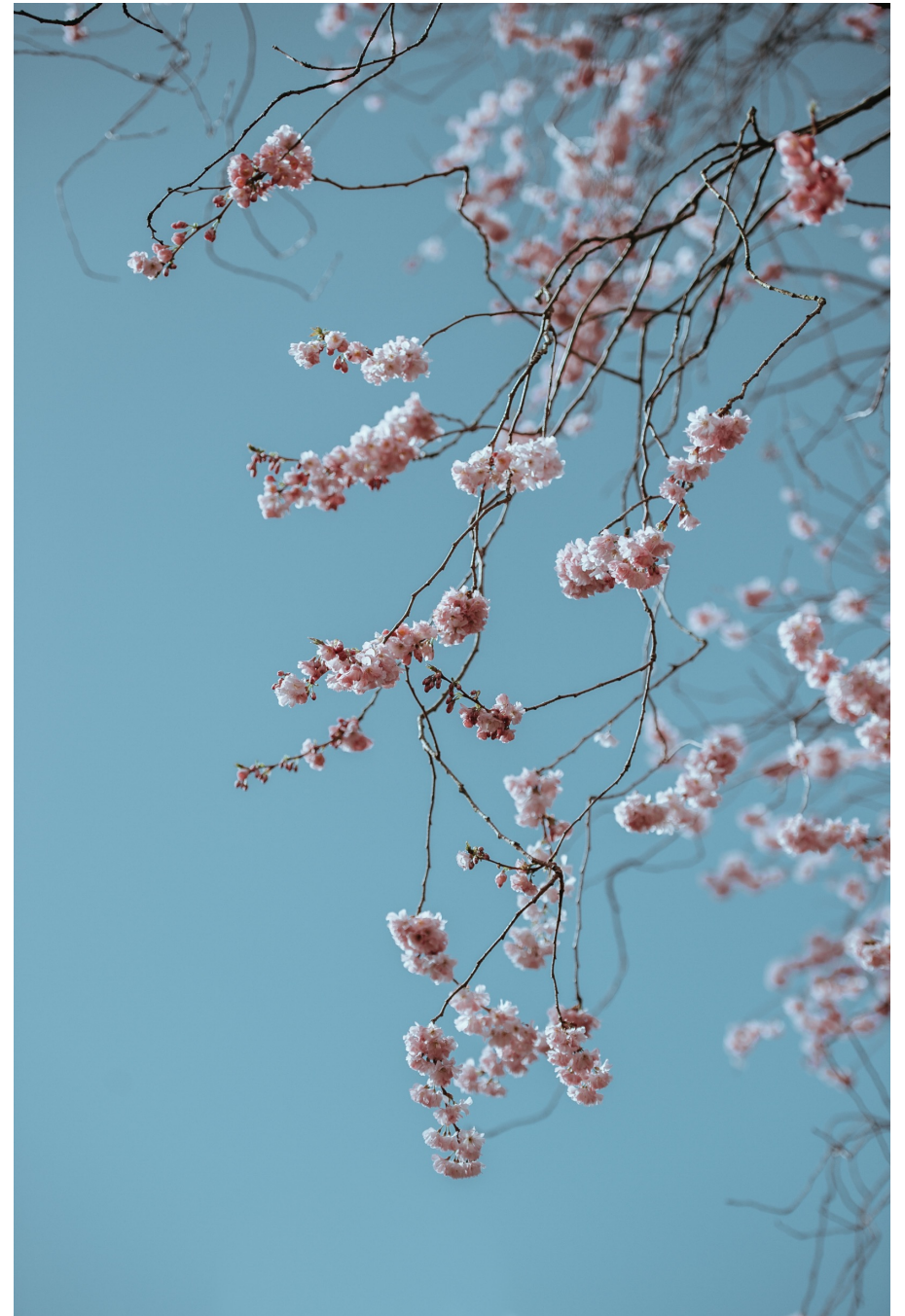
**Organic Matter** – Dead living things in the process of breaking down, forming a large source of carbon-based compounds found in environments such as soil.

**Humus** – Dark, organic matter that forms in soil when plant and animal matter decays.

**Decomposer** – An organism, especially soil bacterium, fungus, or invertebrate (spineless creature), that decomposes organic material.

**Translocation** – The movement of something from one place to another.

Fun Fact! Soil contains a special hormone that makes us happy when we smell it.



# Soil, not dirt!

## What is in soil?

- Minerals (pieces of rock or sand)
- Organic material or “humus” (dead plants and animals)
- Water
- Air (gases)

## What lives in soil?

- Fungi
- Bacteria
- Invertebrates you can see
- Invertebrates you can't see

- Springtails
- Zygomycota
- Earthworms
- Nematodes
- Mites
- Azotobacter
- Woodlice
- Clostridium Ascomycota
- Centipedes
- Ants
- Dipluran
- Azospirillum



# Fungi

Mycelium and mushrooms are just part of a 'fungi'.

They are made up of sprawling "hyphae", which look like threads or little roots.

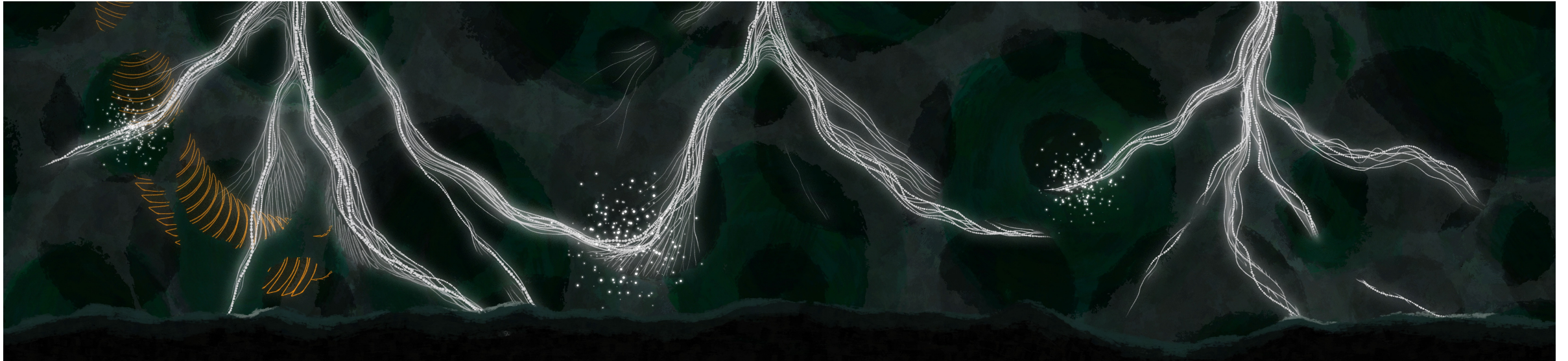
The mushroom is the reproductive part of the fungi, which comes up above ground is the most visible to humans.



# Hyphae

Hyphae are very important to the soil food web, because these fine threads can spread over long distances, and capture water or nutrients from far away and bring them back along the threads and close to plant roots.

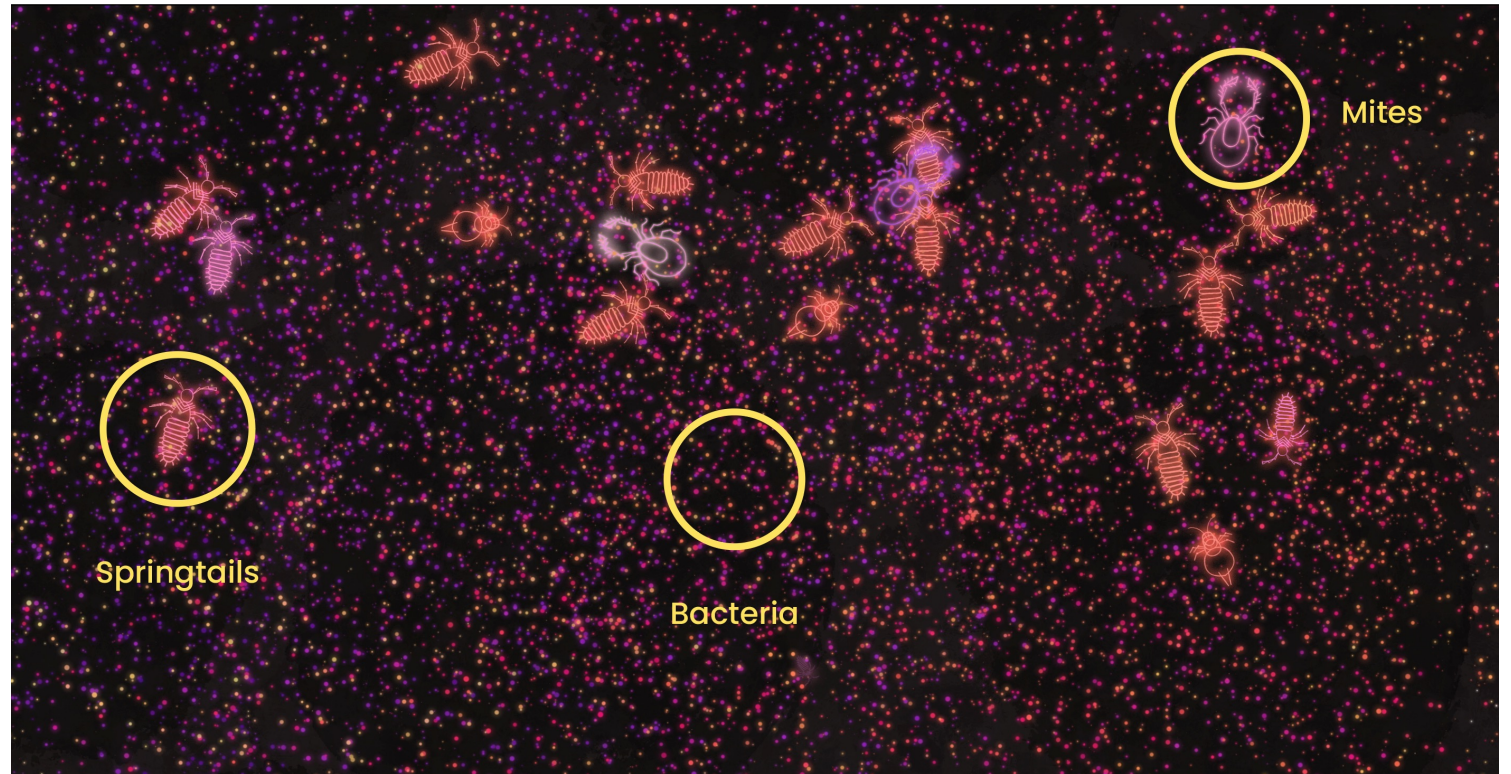
Hyphae are what make up "mycelium networks" underground, even meaning trees can send messages, nutrients and moisture to each other.



# Bacteria and Microscopic Invertebrates

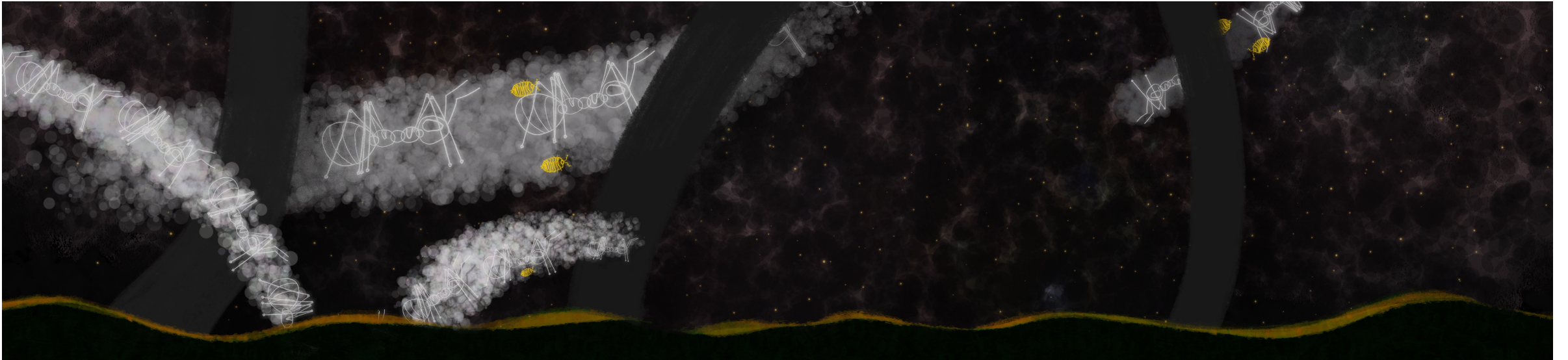
Bacteria, like fungi, supply plants with the minerals they need through the plant's roots.

As the bacteria multiply, minuscule creatures like springtails, mites and nematodes eat them.



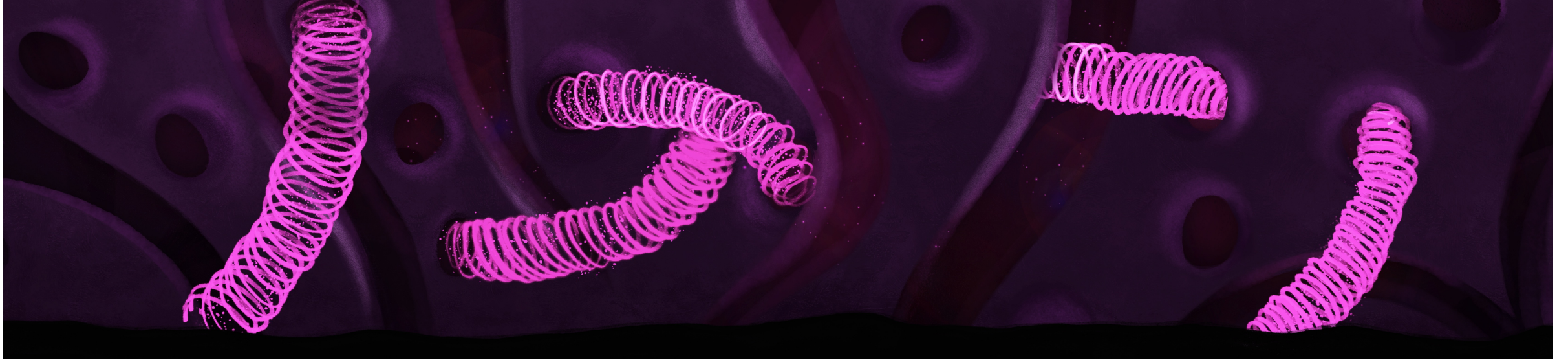
# Ants

Ants build passages through the soil and create their own structures, like coral reefs in the sea. They aerate the soil and make room for other creatures to come underground.



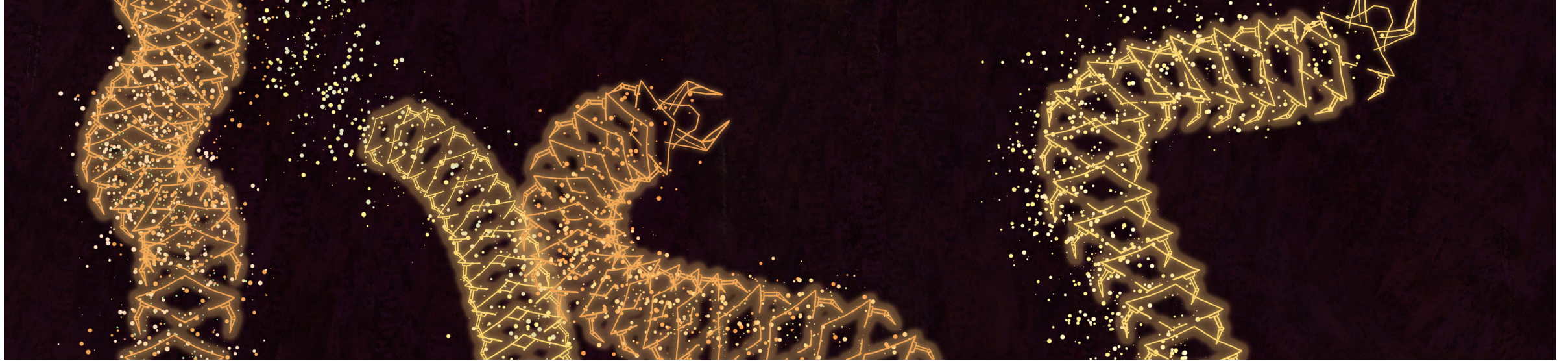
# Earthworms

Earthworms create tunnels too, whilst decomposing organic matter and translocating it around the soil, churning it up. They are the intestines of the earth!



# Centipedes

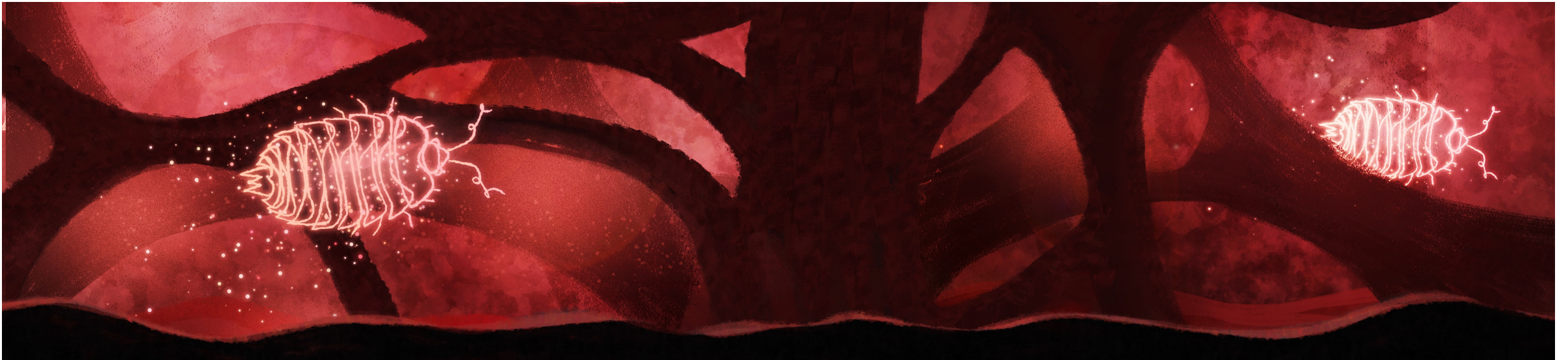
As the plant root moves on, the frenzy of activity quietens down, leaving just the remains of the insects the predators have killed.



# Decomposers: Woodlice and Dipluran

More insects such as woodlice and dipluran feed on organic matter, including the remains of these insects, turning them into humus, and the cycle begins again.

As a plant root moves on to another place, the frenzy of activity quietens down, leaving just the remains of the insects the predators have killed.



# The Four Key Processes

**Additions:** Dead plants and animals (organic matter) rot into the soil.

**Losses:** Plants take nutrients and water out of the soil.

**Transformation:** Organic compounds form.

**Translocation:** Matter and nutrients move about the soil with the help of soil creatures.



# Soil Types

Different soils have different properties depending on what they are made out of.

**Sandy soil** is paler, it has large bits in it and water can drain through it much easier.

**Clay soil** has tiny particles, it is stickier and darker, and it can hold much more water and nutrients, but it can dry and become very solid too, because there aren't bigger particles to trap any air in.

**Loam soil** has a mixture of sandy and clay particles, making it good for drainage, but also rich in nutrients.



# Soil Experiments

Shapes you can make	Soil Type
Cone only	Sandy
Cone and ball	Loamy sand
Cone, ball and straight worm	Loam
Cone, ball worm, and bent worm with cracks	Clay like loam
Cone, ball, worm and bent smooth worm	Clay

