

Building a microcosm

Dimitrije Ivancic, grund1535,
Rietz

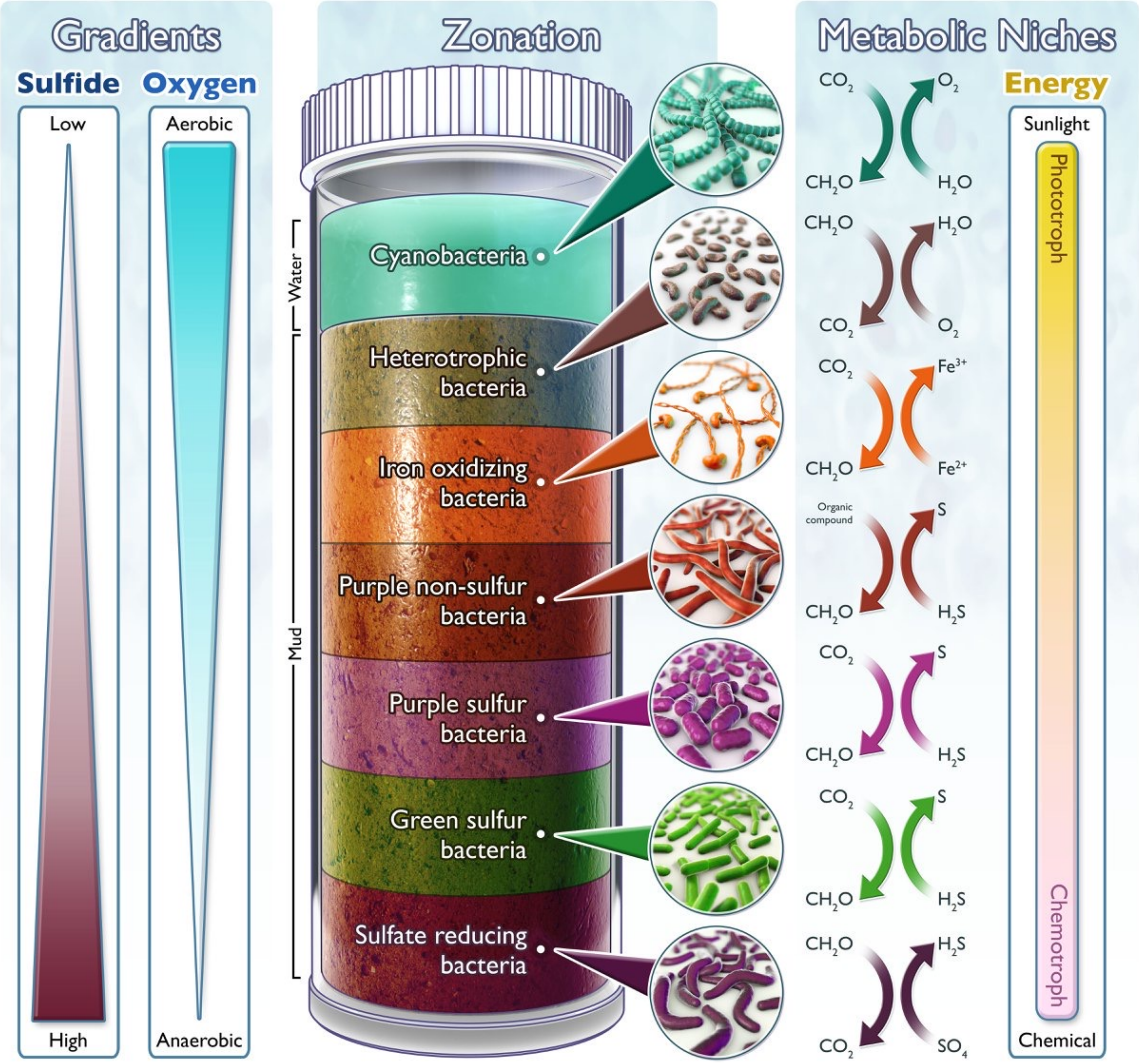
microcosm

microcosm

noun

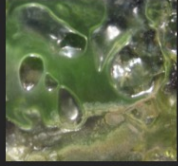
1. a community, place, or situation regarded as encapsulating in miniature the characteristics of something much larger.

Winogradsky column



3 months old Winogradsky column, made from rice-field mud collected near Irino, Shikoku, Japan, April 2023

Composition of a Winogradsky column



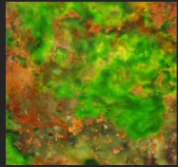
CYANOBACTERIA

Like plants, cyanobacteria absorb carbon dioxide (CO_2) and produce oxygen. Unlike plants, they absorb light with a blue-green pigment, called *phycocyanin*.



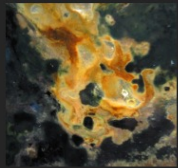
IRON OXIDIZERS

These orange bacteria live somewhat lower down, where there's less oxygen.



ANAEROBIC PHOTOSYNTHESIZERS

Anaerobic means these bacteria live where there's no oxygen. *Photosynthesizers* means they get energy from light.



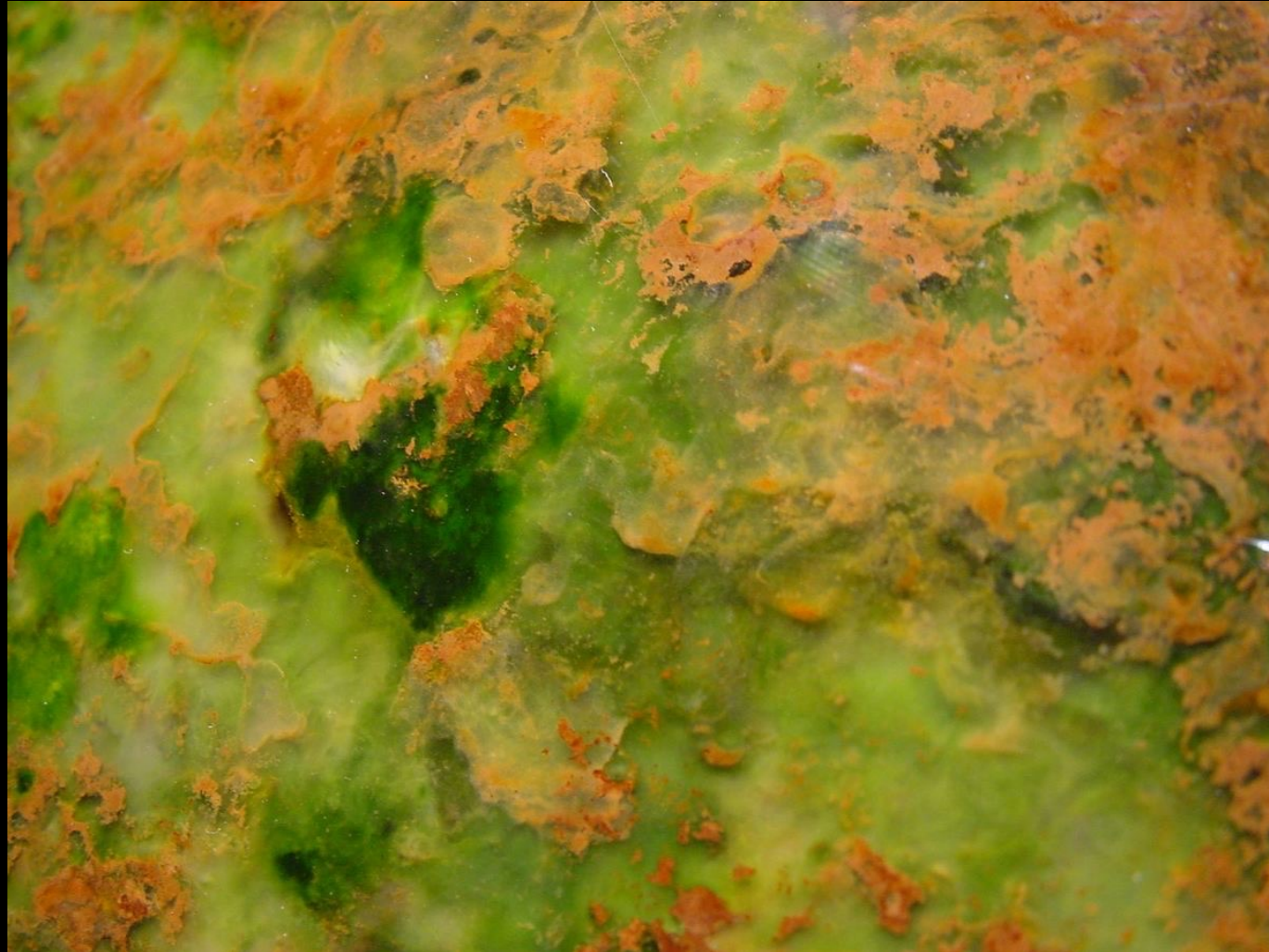
CELLULOSE DEGRADERS AND SULPHUR REDUCERS

These gray bacteria do not harvest light, but instead get energy by consuming *cellulose*, or plant fibers.

<https://www.exploratorium.edu/snacks/bacteriopolis>







<https://deniseking.org/projects/exhibits/bacteriopolis/>



<https://deniseking.org/projects/exhibits/bacteriopolis/>



<https://deniseking.org/projects/exhibits/bacteriopolis/>





<https://deniseking.org/projects/exhibits/bacteriopolis/>

Tools and Materials

- A clear container, such as a jar, tube, or flask, plastic wrap.
- Funnel with wide spout, that will fit the opening of your container
- Mud (from the bottom of a pond, shore, or other wetland) or dirt (from any local environment), enough to fill your container
- Basin large enough to hold your mud or dirt
- Water
- Optional: Shredded paper, a raw egg, nails, cardboard



Assembly

1. Place the funnel on the top of your clear container.

2. Place the mud or dirt in a basin.

3. Add a little water to the mud or dirt and mix with your hands (or a spoon), so that the resulting mud is loose enough to be squished through the funnel. Try not to add too much water—you can always add more, but you can't take it out.

4. Add nutrients to your mud culture. You can add a handful or so of finely shredded paper, a raw egg, both, or neither.

5. Fill the clear container with mud by pouring and squishing it through the funnel with your hands. This can make a mess, so you may want to cover your work space with newspapers.

Optional: Another variation is to add an iron source to your culture by dropping a nail or two into the container, roughly in the middle of the mud.

6. Put the lid on the container, but keep the lid cracked so that air can enter the container. If your container doesn't have a lid, cover the mouth loosely with plastic wrap.

7. Place your container in a sunny window (with the foil side facing the window, if you used it), and let it sit undisturbed for about 24 hours.

Collection of Mud

Collection of mud from river and puddle, rietz



<https://youtu.be/3xDexh8vJv0>