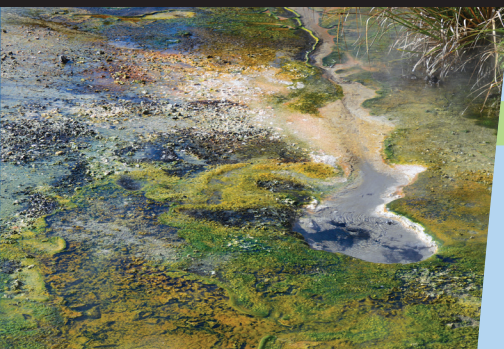


THE AMERICAN BIOLOGY TEACHER



About Our Cover

Our cover this month looks more like a work of abstract art than something from the world of the life sciences, but appearances can be deceiving.

This image was taken at one of the many steaming hot springs found in the town of Rotorua, a geologically active region on Te Ika-a-Māui, the north island of New Zealand. Hot springs like these and others around the world are understandably quite hostile to most living things but, in fact, support a wide variety of organisms called thermophiles or “heat-loving” creatures that live in environments over 40°C. Some of these geothermal springs can be much hotter and yet still support microbial life at temperatures exceeding 80°C!

Most of these hot-spring thermophiles are archaea and traditional bacteria of a wide variety of species with shapes that include the typical rods, cocci, and filaments and some unique square forms. These creatures also come in a wide variety of colors, as can be seen in the cover photograph. Imagine the adaptations that have occurred that allow metabolic pathways to function at temperatures that would parboil most other living things.

Thermophiles are found within a larger group of organisms nicknamed extremophiles because they can thrive even in hot, saline, toxic, or acidic environments. They were first discovered in 1966 in Yellowstone National Park and are now known worldwide in places that scientists originally predicted would be so challenging that nothing could live there.

These creatures get energy from chemicals in the water. Another extreme group of organisms discovered in 1977 live near small volcano-like vents deep in the ocean. These hydrothermal vent communities have fascinating but relatively simple food chains based on chemosynthesis rather than photosynthesis. Scientists have shown considerable interest in these communities as potential models explaining the origin of life on Earth and even as representative of extraterrestrial environments.

This digital image was recorded with a Nikon D810 camera using an image stabilized 28–300 mm zoom lens. The photographer is William F. McComas, editor of *The American Biology Teacher*, Parks Family Professor of Science Education, and director of the Project to Advance Science Education at the University of Arkansas (mccomas@uark.edu).

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The cover image of the May ABT may have been misidentified. Instead, the image was likely a Munk's Devil Ray (*Mobula munkiana*).