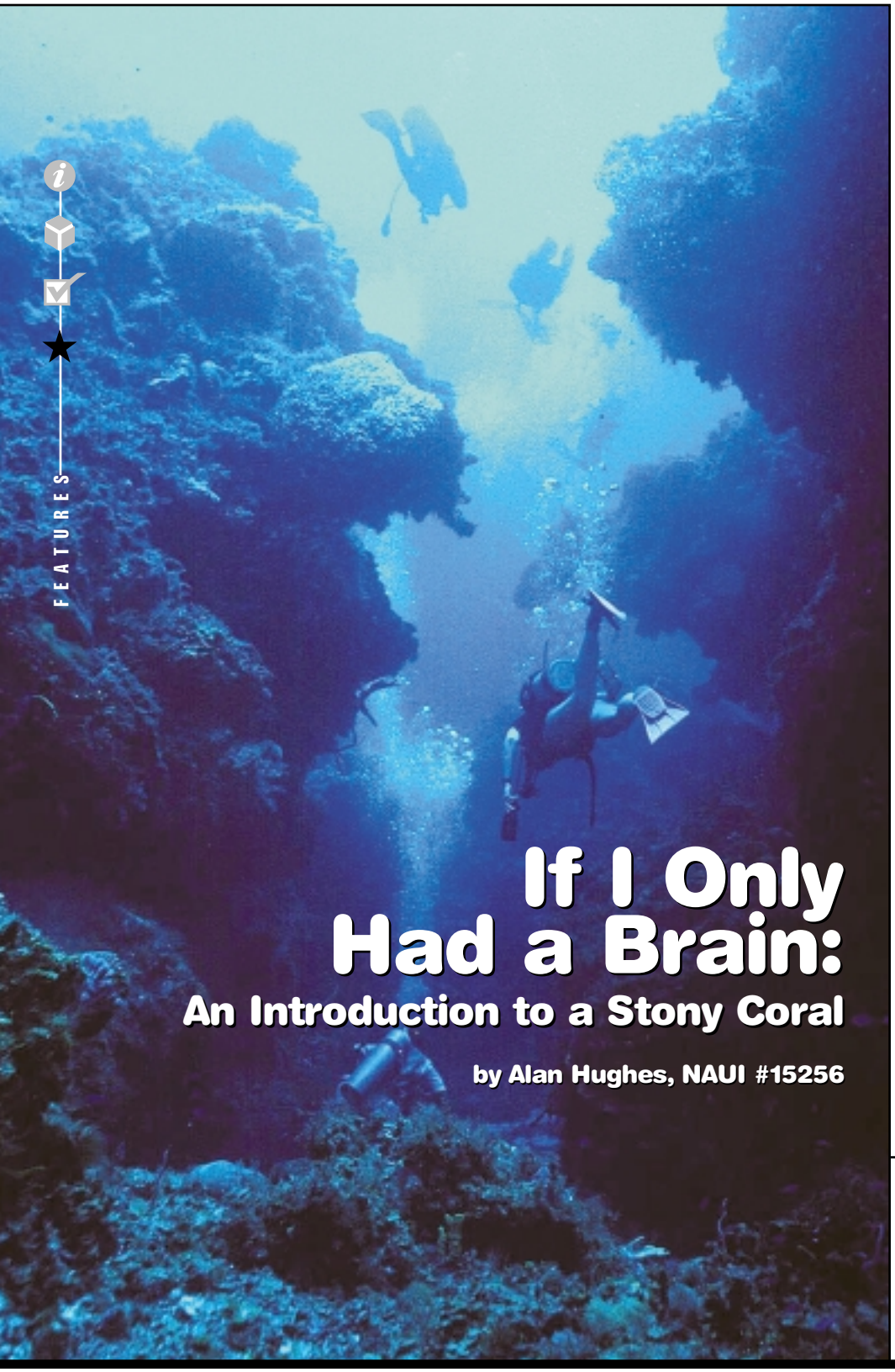

FEATURES

If I Only Had a Brain:

An Introduction to a Stony Coral

by Alan Hughes, NAUI #15256

Imagine starting a game of 20 Questions. When you ask, "Animal, vegetable, or mineral?" the response you get is just "yes." You can either be totally confused, or you can immediately see that your field of choices has been greatly narrowed. "Yes" would be a likely response if the subject were one of the stony reef-building corals like brain coral. You could describe brain coral as "an animal full of vegetables with a mineral shell."

Brain coral (phylum Cnidaria, class Anthozoa, genus Diploria) is the first coral that most people learn to identify. It's an easy one to spot because, well, it looks sort of like a brain, bulbous and convoluted just like your own cerebrum. Upon closer inspection, however, you'll see a whole lot more detail on the surface of brain coral than you would if you cracked open the skull of one of your favorite divemasters.

The basic body structure of corals is the polyp. Polypoid bodies consist of a basal disc (for attachment to the substrate they sit on), a body stalk (containing the gastrovascular cavity or stomach), a crown of tentacles (containing tiny stinging cells called nematocysts or cnidoblasts, used for paralyzing and capturing prey for food), and a mouth at the center of the ring of tentacles (for eating). This body design is shared with the sea anemones, also

Above: Divers swimming between massive coral heads in Cozumel, Mexico. It's hard to believe that these enormous reef structures began as a single polyp the size of a pencil eraser.

Anthozoans, and is essentially the upside-down version of the medusa body form of jellyfish (which lack the basal disc).

The stony, or scleractinian, coral polyp sits in a calcium carbonate (limestone) cup, or outer "skeleton," which is secreted by the lower half of its body and basal disc. As long as the polyp remains alive, calcium carbonate continues to be deposited beneath it, building up the stone, and over time resulting in the massive coral head structure, the coral "rock" that you see in gift shops. This shell of rock provides a solid substrate to support the coral colony, and it acts as a fortress to protect the polyps from damage. With their tentacles retracted, there is very little of the polyp projecting above the cup, making it difficult for fish and most predators to eat them.

Brain corals, and other reef-building corals, are colonial animals. A brain coral colony may consist of hundreds or thousands of individual polyps, all joined together by a continuous horizontal sheet of tissue. Close inspection of brain coral will reveal many slit-like mouth openings down in the grooves, with the tentacles lined up along the sides of the convoluted ridges.

The underside of this continuous tissue connecting the polyps together also secretes calcium carbonate (which accounts for stone buildup in between the cups formed by the individual polyps). Being on the outside of the rock, this soft layer of tissue is what careless divers can destroy most easily with careless kicks or by dragging dangling consoles over the reef.

That connecting sheet of tissue is an extension of the polyps' body walls, and as such contains an extension of the gastrovascular cavity, which allows brain coral polyps to easily share food with their neighbors. The colony as a whole benefits from the successful feeding of individual polyps, even if some of the polyps are unable to capture any of the small fish or zooplankton that make up a coral's diet.

But even corals that feed successfully can't rely solely on their prowess as hunters for their sustenance. Within the tissues of most corals live plant cells called zooxanthellae, which give brain corals the brownish, yellowish, greenish, or bluish color that we see. These plant cells use waste products from the corals and sunlight-driven photosynthesis to create sugars that contribute to the nutrition of the coral. It's for this reason that most coral growth is limited to relatively shallow, relatively clear water. Without sunlight, the zooxanthellae can't photosynthesize, and the coral won't thrive.

While the brain coral colony grows its substrate vertically by secreting limestone, it also grows horizontally, reproducing itself asexually by budding new polyps from the oral discs around its mouths (corals reproduce sexually in order to form new colonies). The oral disc lengthens and forms new mouths in it. A row of brain coral polyps will share a common oral disc with many small mouth openings, which tends to make the polypoid body design a bit less distinct in brain corals than in other genera, like the star corals.

When you see a large brain coral colony, you're likely to see other species of marine life making it their home as well, like blennies, Christmas tree worms, and boring sponges. So you see, not only is brain coral an animal full of vegetable matter (zooxanthellae) with a mineral (limestone) shell, but it can also be a miniature reef habitat all its own.

References:

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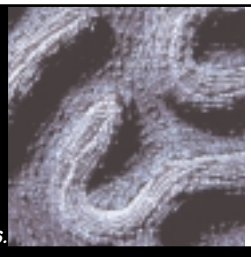

1. Close up of common symmetrical brain coral, showing mouth slits in the oral disc area between the ridges; 2. Close up of common brain coral, showing several mouth slits in the oral disc area between the ridges; 3. Knobby brain coral; 4. A Christmas tree worm has dug it's homestead in a common brain coral; 5. Grooved brain coral; 6. Knobby brain coral.