undercurrent®
THE PRIVATE, EXCLUSIVE GUIDE FOR SERIOUS DIVERS

P. O. Box 1658, Sausalito, California 94965
Cable Address: Gooddiving

Vol. V, No. 5 May 1980

The Heddy; Roatan

A Lay Back Dive Cruise For All Skills

Undercurrent readers who take dive trips with See and Sea Travel nearly always report back that their trip was an unqualified success, that their expectations had indeed been well met. See and Sea offers trips to remote worldwide dive areas, and in most cases the divers live aboard a vessel which motors to distant and virgin reefs. In some cases divers are able to find trips to the same destinations for less money, but See and Sea prides itself on providing first-class treatment for its charges while guaranteeing unlimited or nearly unlimited diving. For sometime we have wanted to take a review trip with See and Sea, but our primary reviewers are known to the staff and it would be nearly impossible to take a trip without tipping our identity. Instead, we decided on another approach. After the most recent trip to dive Roatan, we obtained a list of participants, and selected one to prepare us a story on that adventure. Once we received the story, we verified the report with a couple of others who had traveled on the same tour. This is the result:

INSIDE UNDERCURRENT

My Roatan diving adventure began on an early Saturday morning as eight participants gathered and introduced ourselves at the TAN/SHASA airlines counter in Miami. Although I knew no one other than my buddy, we quickly relaxed with each other. There was no pressure to establish ourselves; being a diver was identification enough. I quickly learned the advantages of traveling in a tour group when a person not with the group was charged $27 for excess baggage; with the tour, we could take whatever we needed at no extra charge and with no fear of getting bumped from the flight, which apparently can happen when they overbook.

When the plane landed at our first destination, which was to be San Pedro Sula, I learned it was not San Pedro Sula. We had landed at La Ceiba because of bad weather. We spent our time drinking Salva, the local beer, in the air-conditioned bar, waiting for the rain to stop. Three hours later we departed

on a SHASA DC-3 for the 30 minute flight to Roatan. (Editor's Comment: There's hardly a traveler to Roatan who doesn't spend hours waiting in one airport or another; flight schedules are relatively unobserved--we have received letters from Undercurrent readers complaining of delays up to 24 hours. In this case, our reviewer was fortunate to be at La Ceiba; at San Pedro Sula there is no air conditioning to aid the suffering travelers through the hot and muggy hours.)

Once on Roatan, we disembarked from our plane with wobbly legs, attributable as much to the beer as the plane ride. We were amicably greeted by Captain John Brady, a tall blond American, and skipper of the Heddy, the vessel destined to be our week-long home. Brady, assisted by the local taxi man, Polo, loaded our baggage atop the VW bus and shuttled us to French Harbor, where we climbed aboard a skiff for the short ride to the Heddy, a marvelous 112-foot, traditional motor sailer. With tall masts and netted bow, there could be no more a picturesque craft. The 112 feet provided plenty of deck space for lounging and stowing dive gear. In addition to four crew members (cook Jessie, 1st mate John, Scotty and Bobby) and the captain, the Heddy accommodates up to twelve passengers in three double cabins and one cabin which sleeps six; there are two heads with hot water showers. The cabins are a bit cramped and can get stuffy, but the sea breezes, drawn in through open hatches by electric fans, normally kept us cool enough. On two nights I slept on the deck, using a lounge cushion for a bed, beneath a million stars.

Although many dive boats spend the first day transporting passengers to the sites, we took our first dive before the boat left port, only two hours after arriving. After a short motor ride in a 15' skiff, we backrolled into 100 foot visibility onto a nice wall covered with mushroom and staghorn coral, alive with schools of grunts and blackcap basslets, an abundant inhabitant of Roatan reefs. From between the coral head, an occasional spotted moray would peer. Although the water was 77°, I was grateful for my shorty wet suit; my buddy, in a T-shirt and shorts, became chilled before the dive was finished, but he soon revived with a hot-buttered rum once back aboard. As night fell we sat down for our first meal, fresh grouper with lemon, tossed salad, green beans, homemade bread and blueberry pie. Indeed a suitable repast to conclude our first day.

On our second day, after a breakfast of spicy sausage, homemade biscuits and scrambled eggs, we departed for Half Moon Cay, seldom dived due to high winds and rough seas. But we had no problem through the calm and blue water, and when we arrived, the crew members aided us with our gear, and with a giant stride off the dive platform, I was soon below. I was struck by the physical similarity of Cayman reefs and walls, but the fish life seemed far more abundant than on Cayman. Parrot-fish, blue chromis, and squirrels were everywhere. Varieties of butterflies swam in and out of coral heads while the sea fans and whips swayed gently. Indeed, a beautiful dive, easily completed with a climb out of the water up a stair-like ladder, after handing a crew member my fins.

Overall I must rate the diving good--a bit better than Cayman because of more fish, and certainly better than, say, the British Virgins--but it was not spectacular, perhaps because it was without surprises--no sharks, no turtles, a couple of eagle rays in the distance one day. I ventured to Belize directly after this trip and found the diving there indeed spectacular. Nevertheless, there was plenty to see here, and plenty of opportunities for the photographer. Only once did I have a bad dive, and that was in Port Royal Harbor where poor visibility made it impossible to find the wreck that we set out for. Other times

Undercurrent (ISSN: 0192-0871) is published monthly by Atcom, Inc., Atcom Building, 2315 Broadway, New York, NY 10024, (212) 873-3760. Second-class postage paid at New York, New York. This guide is available to the diving public by mail subscription only. To maintain its independence, *Undercurrent* carries no advertising.

If you wish to receive the accurate, inside information *Undercurrent* offers, please send your check for $19 in U.S. funds. Send new subscriptions and address changes to the address shown above.

the water was clear, the reefs alive and colorful, and the fish friendly.

Of course we could dive as frequently as we wished. Never did I have to wait for one of the 25 tanks (mostly steel 72s, but some aluminum 80s) which were always filled to the basic capacity. Normally, I would dive twice in the morning, then take a third dive and even a fourth dive after lunch. Except at night, divers are free to dive alone or with buddies. But even at night a solo diver only has to say "let's go," and a crew member would take him out in a skiff and remain above to follow the diver's light, and another crew member would join him below. The only service the remarkable crew didn't provide, was keeping track of a diver's decompression profile, which is obviously the diver's own responsibility. Depths ranged from 20 to 150 feet, but deep diving is discouraged since the closest recompression chamber is hours away by an inefficient airline.

Most of the time we rejected night diving in favor of a tropical sunset, a ration of rum, and the evening's repast. On my one night dive, at South Barabelle Island, our group, with many first time night divers included, huddled so close together I could only think of Jack McKenny's movie "Things that go Bump in the Night." Along with the common sleeping reef dweller, I was able to hold two snoozing puffers, pet a few parrot fish catching forty winks between the piller coral, and ogle a large, ominous looking scorpion fish resting between coral heads. On one night we anchored in Port Royal Harbor, where the proprietor of Port Royal Lodge invited us to his quarters for free potables. I listened carefully to tall tales of pirates and battles along the Port Royal Coast. Then on the following day I found myself unsuccessfully searching every crevice for cannonballs and pieces of eight. Because the dive sites are all within a mile from shore, passengers who cared to beachcomb could be easily motored ashore for an afternoon. Snorkeling was excellent and the beaches clean, but the sand fleas could be viscious; so, without a healthy coating of some repellent, a stay on the beach could become quickly unpleasant. Expecting the threat, I took three brands and found that Cutter's did not work, but 6-12 and OFF seemed to keep the pesky runts away.

Divers, like armies, seem to run on their stomachs, especially if one is taking four tanks a day. Food on board was plentiful and tasty, but it could never be mistaken for the cuisine provided aboard a Cunard flagship. Cook Jessie lightened up our palates with tasty bread and rolls, baked daily, or her scrumptious chocolate chip or peanut butter cookies, and her galley-made beef noodle or bean soups would complement nicely standard fish and vegetables. About half the lunches were spicy (spaghetti, hot dogs, chili), which doesn't suit me well when I dive, but others did not complain. I was surprised to find no fresh fruits, but they're hard to come by on the Isle of Roatan, I was informed. French wine was offered at $9/bottle, drinks at $1.50, beer at $1.

On our last day we motored back to French Cay Wall, where the trip began, for a farewell dive. It was among the best. With black coral trees scattered from 40 feet down to the depths and schools of jacks shining against the deep blue background, I wondered if this wasn't like Cozumel once was. We returned to harbor before dark, rinsed off our gear in fresh water and let it dry for a morning packing, while a crew member went to town to reconfirm our reservations and guarantee seats on the morning flight. Our final meal, of lobster and steak, baked potatoes and salad, and coconut custard pie, accompanied by plenty of wine and a rehashing of stories, put the final touch on a fine week of diving and companionship.

As those who have been to Roatan before might expect, we waited for three hours for a flight out. We spent the time watching the locals race horses on dirt runways, not really minding the delay since my mind was filled with pleasant memories. The only hardship stemmed from the lack of any toilet facilities at the airport; the new airport building sits unopened due, we were told, to poor construction. When nature called, the only place to head was behind a

tree or a bush, of course with a bottle of repellent safe in hand.

Trip Arrangements: Arrangements through See and Sea worked very smoothly. The tab is $750 (nondiver $675) plus airfare from your point of departure. Any group or individual wanting a preview may order a slide show of the boat and the tour for $50, refundable upon return of the slides. Write See and Sea at 680 Beach St., Suite 340, San Francisco, CA 94109. (415/771-0077)

The Fine Art Of Fish Feeding

So They Don't Bite The Hand That Feeds Them

In the last few years fish feeding has replaced fish killing as a popular underwater pastime. In the wild kingdom there's no habitat quite like a reef, where a variety of creatures, big and small, will approach a human for a personal handout. Naturalists may take years stalking snow leopards or mountain gorillas for a single glimpse, and hikers will delight if they catch a view of any four-legged creature in the wilderness. But scuba divers on a reef find themselves surrounded with hundreds even thousands of critters, and, with a little patience, will find many willing to be hand fed.

Just like wilderness creatures, reef fish may not distinguish between finger food and a finger-for-food. To become an active and successful fish feeder, a diver will be prudent to observe a few rules and follow a few tips. In my travels during the past few years I've spoken with the experts and what I've learned from them I'd like to share with you.

I might begin with a simple maxim: *stay alert or you'll be dessert.* When you least expect it, some critter will mistakenly attempt to sample you and even the daintiest little damsel fish can take an annoying nip. Keep an eye on every dining denizen during the entire meal—even when all the food is gone—lest one steals a finger for its final bite.

George Marler, noted British Virgin Islands guide, says, "Never be aggressive toward any form of marine life." He means, agitate an animal and it may masticate you. Charge on it suddenly and you invite retaliation. Scare it and suffer the consequences.

But, approach it slowly and unobtrusively and you can get quite close. Better yet, stay still and let the animal come to you. It's as curious about funny looking things underwater as you are. So take it easy, bring some food, and let the animal find you. (If you're interested in feeding anemones, however, you may be in for a long wait.)

The food you bring should be attractive and easy to handle. Though they aren't normal fare for marine life, hot dogs, bananas and candy bars sometimes meet the criteria. Steve Klem has written that his pet groupers gobble such morsels with great gusto and demand more, and Bob and Marca Fronk of Palm Bay, Florida, say the same about a Nassau Grouper in the Bahamas they call "Mad Dog." His choice is Kentucky Fried Chicken, but never the extra crispy kind.

Most fish, whether in salt or fresh water, seem to go for bread, another unnatural food for marine life. George Marler says *stale* bread is best because "fish like it and we don't." But bread, stale or not, doesn't make it with many critters. They prefer heartier and more organic fare: sea urchin, fish, crab, squid, abalone, etc., and none of that's found in George's stale bread box. It's in the water, or a bait store, or the garbage can after the day's catch has been cleaned. The most attractive food seems to be what's eaten normally. Some of the experts gather such food—urchins, mussels, clams, etc.—from near the areas in which they feed. I prefer to get it from a bait store or garbage can, which creates less havoc with the natural environment and helps preserve the local ecosystem.

"If you're right-handed, feed with your left, so if you do get bitten, you'll be able to write home about it."

Regardless of the source, food for hand-feeding must be easy to grip. Bread, though it can create miniature feeding frenzies, falls apart quickly in a piscatorial tug-of-war. Unless, of course, you use Marler's trick. He puts the stale bread in a plastic bag and lets his favorite fish, the coney, rip the bag open to eat. If you do that one, please don't litter—take the bag home with you. Other foods, like anchovie, sardine, or ballyhoo, are strong enough so both you and a fish, crab, or lobster can pull on an end without breaking it apart immediately. Grab the head end, not the slippery tail, and you can hang on long enough to pull your eater out of its lair for a better look and a chance for your buddy to shoot a photo or two.

And, when you grab the bait, do it with your nondominant hand. If you're right-handed, feed with your left; so if you do get bitten, you'll be able to write home about it.

If you want the bite to do the least damage, don't hold the food between your thumb and forefinger. Instead, make a fist and insert the food's rough end between your second and third fingers, so it dangles out from your fist. If the feeding critters miss, they'll have

to open very wide to bite your whole fist, and most can't open that wide. For those that can, it doesn't make any difference on how you hold the food; any bite will be drastic.

Where you carry the food also affects your overall safety. Using a vest pocket may be okay for bread because it doesn't attract the more ferocious animals. But stick a tasty fish in the pocket and you'll be inviting a direct frontal attack. For example, the moray eels in Pennekamp Park have been fed so much that they get quite pushy when you don't cooperate. To have an eel look in your vest pocket, and encircle your body in the process, will probably encourage you to take up a calmer kind of diving—like sky diving. Carry your food in a goodie bag or some other container that you can get away from your body quickly. If a hungry monster bothers you, just drop the food and hightail it out of there.

Critter feeding by hand has three distinct progressive phases: chumming, one-hand feeding, and two-hand feeding. Chumming gets the local animals familiar with you, one-hand feeding brings them closer, and the two-hand stuff is for petting.

To chum, broadcast the food into the water so animals can eat it without interference from you. Breaking the food in small pieces makes it go farther. In the Pacific Northwest, Rick Brock chums a wolf eel out of its den by laying small bits of sea urchin near its front door. Bob Widmann of Santa Cruz, CA, suggests that seasick divers are good chummers, if they'd cooperate by restricting their broadcast to submerged sites instead of over boat rails. Chumming lets the animals get used to your friendly presence and honorable intentions.

When they are relaxed and consistently eating the chum, go to phase two: one-hand feeding. Hold still and fully extend one hand with the food. Some time may pass, but eventually one animal goes for the bait and starts the frenzy.

In two-handed, one hand holds the food, the other pets the animal, whatever it may be. Done with gloves on for protection, or with one off for better tactile communication, two-handed feeding is the ultimate intimate interaction. Slow motion is the key to getting the most out of it. Move quickly and you'll pet water—not the angelfish or the eel which you're seeking.

Start small then work up as you gain skill, confidence, and experience. Begin by sneaking up on a fully blossomed anemone and slip a tiny hunk of fish bait onto one of its tentacles. There's no danger of bites as it gracefully folds into itself to consume your donation, but there may be a danger of stings from the larger ones. Large or small, however, you won't be pursued. Hold a piece of kelp close to a hungry ab's tentacles. It will leap up, pivot its mouth around to the kelp, and chow down. For those unfamiliar with an ab, its mouth is very near the flatter end of its shell, at the end of the row of holes. A starfish's mouth is in its armpit, the center of its body, but isn't for tasting. A starfish senses food with the tips of its arms, so that's where to put food to feed one. After detecting the food, the starfish will either crawl over it, or move the food along an arm to its mouth.

Bob Widmann tells of pitting starfish and abalones against each other in his feeding games. He puts a sunburst star near a small ab and watches the star pursue the ab with the thought of a good dinner. Since little abs can really run, the starfish usually stays hungry. I've done the same with a sunburst and a sand star, and the sand star usually escapes by burrowing straight down. I wonder if the sunburst ever gets to eat.

Higher on the size and speed scale are crab and lobster. When they take bait, they tear it apart and tuck it down their throats. Patience is the main attribute of a successful crab/bug feeder, but is wasted if the animal is not hungry.

Fish seem to be hungry always, so are the easiest to invite to a meal. Great schools of sergeant majors, yellow-tail snappers, and senoritas will flock eagerly around a feeder. Others, like rock fish, sculpin, cabezon, hinds, and groupers, tend to be individuals, and they have personalities to prove it. They become pets and evoke many laughs with their suspicious stares and sudden swallows.

Another comedian underwater is the cormorant, a fishing/diving seabird. Thirty feet down off the California coast, Gordon Heck, co-owner of San Diego's Diving Locker, had one return repeatedly to take anchovies from his hand. It flew down, flapping its wings like crazy, just to get several courses of a free meal.

Octopuses don't fly, but according to past NAUI President Bill High, they are most fun to feed because they are "exciting, intelligent, fun, have character and are characters." Holding a crab by the hind legs in front of an octopus cave, letting the animal wrap arm after arm around the crab and his own arm, seems to turn Bill on. It would me too, if the octopus were only a foot across, but the ones Bill plays with are five times as large, and more. His warning for divers starting this grabbing game is to not let an eighteen footer "settle on any body parts until you can stand the embrace."

"...Norine Rouse of Palm Beach, Florida, doesn't feed her eels or turtles anymore—she's seen too many of the ones she's tamed come back as part of a fisherman's catch."

Rick Brock feeds wolf eels in Puget Sound. Half the battle, he says, is shaking the belief that the eels are out to get divers. They generally aren't; they seem as fearful of divers as divers are of them. That fear is good for both sides because it increases caution. Lack of caution, by either a careless diver or a "tamed" eel, can result in injuries to both. The over-confident diver gets bitten, the over-friendly eel gets speared. That's why

Norine Rouse of Palm Beach, Florida, doesn't feed her eels or turtles anymore—she's seen too many of the ones she's tamed come back as part of a fisherman's catch. Now she just pets them, but without the benefit of food. She doesn't want to set them up for someone else baiting them into a kill shot.

In Seattle, where the spearfishing pressure is not as great as in Norine's Florida, Rick says the diver feeding a wolf eel must relieve its anxieties. Slow motion, a bit of food, and nonthreatening moves all help. To stop the meal, according to Norine, "drop the last piece you feed them and move away or they often pursue you begging for more and bite the hand that fed them."

Barracuda can also bite the hand that feeds. Shy in the wild, they become hazardous once they've succumbed to being fed. Their high speed makes them capable of darting in from nowhere to snatch bait out of your hands before you're ready to feed, and they can take a good part of your hand with the food. Barracuda are best left unfed, as are sea otters, sea lions, and larger animals. Like hungry dogs, they often bite more than is offered.

If you get bitten, treat the wound carefully and completely; a doctor's care is advised. Since diving waters can be contaminated, infection may accompany the physical damage of a bite.

Feeding fish and friends underwater can be a lot of fun. It can also bring pain. Make your own judgment, but if you do feed, stay alert...or you'll be dessert.

The writer, Lou Fead, has worked in virtually every aspect of sport diving. His articles appear frequently in *Skin Diver* and *Sport Diver*, and he is the author of the fine little paperback book, *Easy Diver*.

Hydro Tests On Steel Tanks

Why Divers May Be Getting A Bum Rap

A galvanized steel tank, presuming a diver takes reasonable care of it, should last a lifetime. Recently, however, we received reports of a high percentage of tanks failing their first inspection and hydro test required five years after the date of manufacture. For example, of the ten tanks submitted for hydrostatic testing by the diving officer at the University of California at Hayward, three failed. We checked with other universities, including UCLA and the University of California, and a number of dive shops and found further evidence of an unusually high rate of failure. To compound the problem, some tanks which failed were returned to the owners with holes drilled through them to ensure that the tanks, now presumed to be dangerous, could not be used again. Owners of these tanks who could not test them further could not be convinced that their well-maintained tanks had failed. Could it be that the hydro process itself was faulty? We decided to look into the problem.

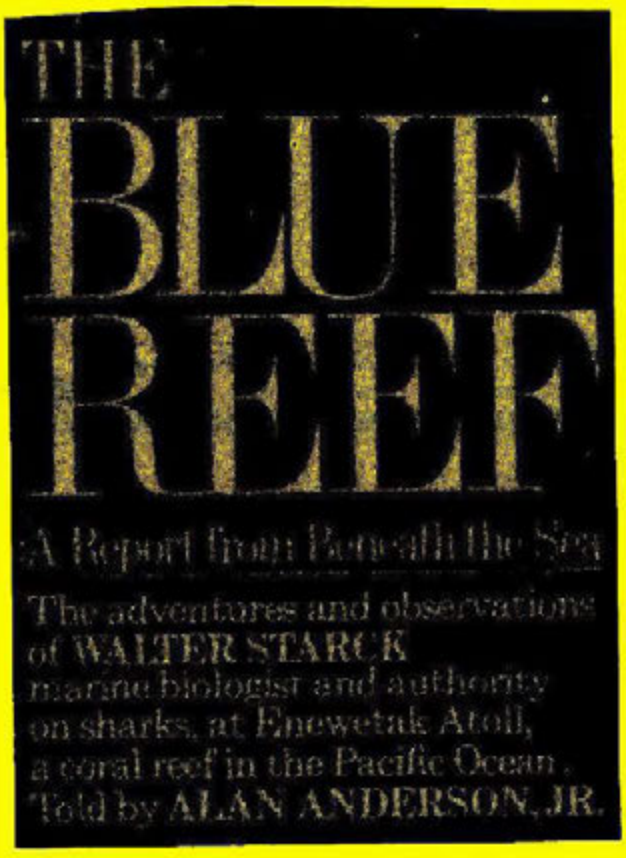
Regardless of the diving company decal on steel tanks, nearly all tanks sold in the U.S. are manufactured by either Norris Industries or Pressed Steel Tanks, the two companies with a corner on the scuba cylinder market. Before tanks are shipped from either company, they are put through hydrostatic tests to comply with federal law and Department of Transportation regulations. To determine the strength of the tank walls, the tank is pumped with water to five-thirds normal working pressure; a 3000 psi tank is pumped to 5000 psi. Volume measurements are taken before pressure is applied, while it is being applied and after the pressure is released. These measurements indicate the permanent expansion of the cylinder and if this permanent expansion exceeds ten percent, then the tank has failed the hydrostatic test and is considered unsafe for use. According to spokesmen at Norris and Pressed Steel, they both have found that taking the cylinder to 90 percent of test pressure and then releasing the pressure and readjusting the burettes before taking the cylinder to full test pressure will "round out" the cylinder and give a true measurement of permanent expansion. This procedure is authorized, according to Norris, by the Department of Transportation.

Once a tank passes its initial hydro, the manufacturer stamps a date on it and sends it to the distributor. Five years after that date, the tank may not legally be filled at a dive shop until a new hydrostatic test is completed, the tank certified safe, and a new date stamped in its wall. Spokesmen at both Norris and Pressed Steel acknowledged to *Undercurrent* that some tanks do fail local five year tests, but in many cases a second hydro finds that the tanks can in fact be certified usable; their walls have not weakened as the first hydro might indicate. John Cottman of Norris told *Undercurrent* that they believe the galvanizing process, which is only used on scuba tanks because they are taken into water, may relieve some stress in the cylinder causing it to go "out of round." The first hydro test shows expansion, but a second hydro immediately after will indicate the tank has maintained its integrity. Bob Spangenberg, engineering vice-president of Pressed Steel, believes the problem may stem from the rough handling given scuba tanks. On the initial hydro the tank rounds out and appears to be inadequate for further use, but a second hydro will again demonstrate the integrity of

POSEIDON'S PRECIOUS PUZZLES.

The beautiful and mysterious world beneath the ocean's surface—one of the last frontiers on earth.

In *The Blue Reef,* a leading marine biologist takes us with him into the breathtaking splendor of this vast underwater universe as he explores the complexities and fascinations of a coral reef in the tropical Pacific.



Living on a research ship, Walter Starck and his family and assistants spent two months at Enewetak Atoll, diving on its reefs and in the blue waters around them.

Using scuba gear and a small open submarine (in which "we felt like large, cumbersome fish-creatures ourselves") and, on the surface, a motorboat, he ranged over the atoll—the outer and inner reefs, the lagoon bottom, the channels, the beaches, the islands themselves—investigating and reporting on the entire reef system and how it all fits together, from the smallest speck of phytoplankton to the largest predator fish.

On display at a coral reef is nature's whole bag of tricks: camouflage, mimicry, predation, symbiosis, threat and breeding behavior, growth and feeding patterns, and more.

And in seeing how these phenomena work, we become acquainted with a whole new world of sea creatures: the mutually dependent snapping shrimp and goby (the tiny goby living in the shrimp's den dug in the sandy bottom and acting as the shrimp's early warning system against predators). The striped lionfish, whose brilliant coloration to the very tips of its ferocious-looking and lethal spines enables it to blend perfectly with the bright coral where it lurks. And dozens of others.

In particular, we come to know the gray reef shark, *Carcharhinus menisorrah*, thought to be the only shark that gives threatening signals before it attacks. By repeatedly provoking such attacks—the last one at the risk of his life—Starck was able to make the unique and valuable observations about the behavior of the gray reef shark that are among the special achievements of this book.

Enewetak is like most tropical atolls—teeming below the waterline with life of "a richness equaled in few environments on earth."

But Enewetak has an additional interest: it sustained 10 years of intensive nuclear testing. Starck's visit, a quarter century after the first explosion, enables him to provide a detailed account of what has happened to the flora and fauna in a place that experienced the equivalent of extended nuclear warfare, and also what has happened to the people of Enewetak, resettled because of the testing and just now returned to their homes—a primitive people catapulted by events into modern times.

The Blue Reef is at once a superb guided tour of an exotic and, to most of us, impenetrable natural kingdom, a vivid picture of the interdependence of living things in one of the most intricate ecosystems on our planet—and an adventure story that encompasses the dangers, the astonishments, and the delights of exploring the unknown. Price: $14.45.

ABOUT THE AUTHORS.

Walter Starck received his doctoral degree in marine sciences from the University of Miami, and is the author of several books and many articles on marine life. He has also written on underwater photography, filmed television documentaries about the ocean, and invented specialized diving equipment. He lives in the Solomon Islands—on an island of his own.

Alan Anderson, Jr., has been a science writer for *Time* magazine and NASA, and a science editor of *Saturday Review;* his articles have appeared in many publications, including *The New York Times Magazine.* He has written two books on geology. At present he lives in Springfield, Illinois, where he was co-founder of a newspaper, the *Illinois Times.*

SUPPLEMENT TO: UNDERCURRENT Newsletter for May, 1980.

the tank.

Any hydrostatic test of a scuba cylinder should involve a visual inspection, cleaning and the hydro test. Although a tank may pass the hydro, excessive pitting or dents, or interior or exterior rust can disqualify a tank. The cost for the full test will range between $15-20. The dive shop will get $5-$10 and for that fee should not only act as the middleman, but should also replace o-rings and check the tank valve and the burst disc and plugs. If the tank isn't visually checked and cleaned, internal rust could clog your regulator.

Six Basic Myths Of Hydro Testing

Myth 1: All hydro station operators understand scuba tanks.

Myth 2: All tanks that are hydro tested are cleaned.

Myth 3: All tanks that are hydro tested are visually inspected.

Myth 4: All hydro testing equipment is accurate.

Myth 5: A tank that has failed the hydro test cannot be re-hydro tested by the same facility or tester.

Myth 6: A tank has to be destroyed or rendered useless if it fails.

The Hitches In Hydro Testing

Federal regulations on hydrostatic testing apply to a wide range of cylinders including fire extinguishers and oxygen bottles. The special problems posed by scuba tanks are not always known to the operators of hydro facilities and many testers are unaware that an immediate second test may certify a tank usable. Because they are unaccustomed to testing tanks which have been in sea water, they may not expect internal rust and fail to provide a proper visual inspection. Some facilities do not have tumbling or cleaning equipment, and before a scuba tank is tested it should be tumbled. Aluminum tanks pose special problems. Their neck threads are tapered, but the adaptors used by hydro stations have flat threads, which can cut a portion of the tank threading and prevent the valve from sealing. Furthermore, if an aluminum tank is dried at too high heat (350° is the maximum) or for too long a period, the tensil strength will be weakened, thereby necessitating a second hydro to determine the tank's integrity.

Although dive shop personnel we spoke with claim to take their tanks to experienced hydro stations where scuba tanks get special consideration, we doubt this is always the case. We are aware of inconsistencies between stations: some are better or more careful than others, some have greater experience with scuba, some understand the "rounding out" process, and some are better equipped. Until 1978, the federal government was unable to make more than a cursory inspection of hydro facilities, covering them no more frequently than every five years. Since 1978, due to a reorganization placing the inspection function under the Hazardous Material Enforcement Division of the Department of Transportation, a more rigorous inspection process has been initiated. In those two years, five independent firms have been contracted with to inspect hydro stations and over 600 facilities have been licensed or relicensed. Although facilities which perform inadequate tests on scuba tanks still exist, the government is disseminating information about the idiosyncracies of scuba tanks. Wayne Cochran, one of the independent inspectors, acknowledged to *Undercurrent* that scuba tank hydro problems do exist, but noted that "I try to alert all facilities that I inspect to the special problems of scuba cylinders."

If Your Tank Fails Hydro

If your tank fails hydro, you may return it to the distributor who will most likely return it to the manufacturer for retesting. The manufacturer may find that the tank's integrity is intact and return it; if the tank fails, but there's evidence that you have maintained the tank properly, there's a good chance that you'll get a new tank—especially if the distributor has a lifetime guarantee. This process, however, can take several months. You'll save time by getting a second hydro at another hydro station. Just as a physician can be wrong in diagnosing a body illness, a hydro station can be wrong in diagnosing a tank weakness. So always get a second opinion.

A Bad Hydro Test?

If you believe that a hydrostatic testing facility has not done a competent job, contact the hydro station and tell them you are unhappy with the job they have done. Next spell out in detail your complaint and send it to: Mr. James Jones, Research and Special Programs and Administration, Hazardous Materials Division, Office of Operator and Enforcement, Transportation Bureau, Washington, DC 20590.

Some divers, however, have had their rejected tank returned with a hole drilled in it to prevent further use. A hydro station which in anyway renders a tank useless (some simply strip the threads) has destroyed personal property—your property—and the shop owner ought to be dragged into court by the scruff of his neck. According to James Henderson, of the D.O.T.'s Hazardous Material Enforcement Division, the law does not specify that a failed personal scuba tank must be rendered useless, as some hydro shops and dive stations claim. The idea to destroy tanks developed years

ago when a compressed gas company drilled holes in its failed tanks so they would not be mistaken for usable tanks. That technique was followed by many hydro stations and people began to believe that failed tanks must be destroyed or rendered useless. Although that may apply to some commercial cylinders, it does not apply to scuba tanks. A diver who has a tank returned with a hole drilled in it has a good case against both the dive shop owner to whom he entrusted that tank and against the hydro station which destroyed it.

Conclusion

It's apparent then that all hydro stations do not perform valid tests. If your tank fails hydro at one station, take it to another. If the station somehow renders your tank useless, hold them liable. If your tank doesn't pass the second test, return it to your dive shop and seek replacement. You may not get one, but then you may be pleasantly surprised.

Addendum

In the process of researching this article, we spoke with several dive companies to discuss our findings and ask additional questions. A couple of weeks after our discussion with U.S. Divers executives, they sent this memorandum to their dealers:

We are becoming increasingly aware of a major problem in the field with hydrostatic test facilities. Several cylinders have been returned to us for warranty replacement under our lifetime warranty program on cylinders. We in turn have returned these cylinders to their respective manufacturers for investigation. Without exception these cylinders have been legally retested and verified serviceable. Hydrostatic test stations are required to be certified by the Department of Transportation. We are advising all of our accounts to verify the certification of the stations with whom they are doing business. As is occurring in the cases mentioned above, cylinders that are certified serviceable on that second test will be returned to the dealer. He will be required to, in turn, satisfy his customer. Should it be that the first test station rendered the cylinder unserviceable by stamping, drilling or in any other way defacing the cylinder, that station is responsible for replacement to the customer. Please keep in mind that it is illegal for any hydrostatic test station to deface or in anyway render a cylinder unserviceable without the expressed consent of the owner.

Should you have any questions, it would be to your benefit to obtain copies of hydrostatic test specifications and governing procedures from the Department of Transportation and the Compressed Gas Association.

Making Your CO_2 Inflator Work

—Overcoming A Possible Design Defect

Have you ever tested the CO_2 inflator on your BC when underwater? Is it easy to pull? How long does it take to inflate? If you're waiting for an emergency to find out, you may be in for a surprise.

CO_2 cartridge activation should be easy and your BC should inflate almost instantaneously if you have kept the mechanism and CO_2 cartridge well-maintained and free of corrosion. However, if the mechanism is hard to pull, if the cartridge doesn't puncture when you pull the cord or if it takes minutes for your BC to fill while your cartridge hisses and sputters, then the design of the activation mechanism itself may be faulty, according to research conducted by Michael Moore and presented at last year's YMCA Scuba Safety Convention in Key West Florida.

A vertical mount for a CO_2 cartridge mechanism seems effective, but the horizontally mounted cartridge could mean trouble. Most CO_2 activators are designed to activate with a pull on the firing lever in a direction in line with the cartridge and away from it. That's easy with a vertically mounted cartridge because the diver normally pulls the cord downward; but if the cord is pulled downward on a horizontally mounted cartridge, the firing pin may move only far enough to nick the cartridge, resulting in a fill as slow as two minutes and, in some cases, no fill at all. Obviously, the cartridge must be thoroughly punctured to fill the BC rapidly.

If the cord hangs through the grommet, the diver may be further restricted from inflating a horizontally mounted cartridge because the grommet does not permit the cord to be pulled horizontally. That problem is easily solved by removing the cord from the grommet and letting it hang free.

A hidden CO_2 cartridge also makes it difficult for the diver to know in which direction to yank the cord. A rescuer faced with pulling the cord should first pull it downward, then swing it back and forth, right and left, like a pendulum, covering all possibilities with one quick action.

But the diver who has to rescue you may not know this. The diver seeking the ultimate in safety had best switch to a BC with a vertically mounted cartridge or make an effort to modify the mount of his current cartridge.

This is a modified version of a section of a forthcoming book entitled *Scuba Lifesaving and Self Rescue*, by Al Pierce, a NAUI and PADI Instructor and a Red Cross Water Safety Instructor and Instructor Trainer.

(see diagrams on page 9)

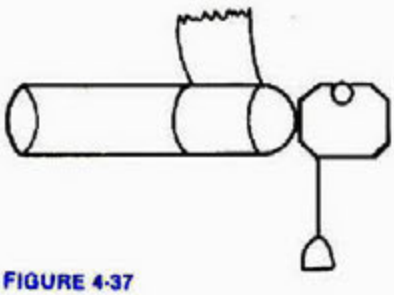


FIGURE 4-37

A HORIZONTALLY MOUNTED CO, CARTRIDGE READY TO FIRE.

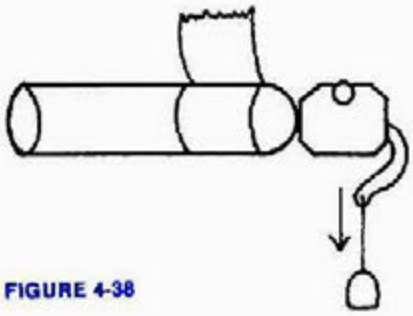


FIGURE 4-38

IF CORD IS PULLED DOWN (THE NATURAL REACTION) BC MAY TAKE MINUTES TO FILL—OR NOT FILL AT ALL.

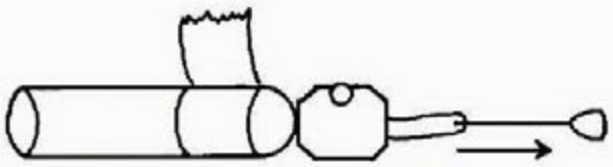
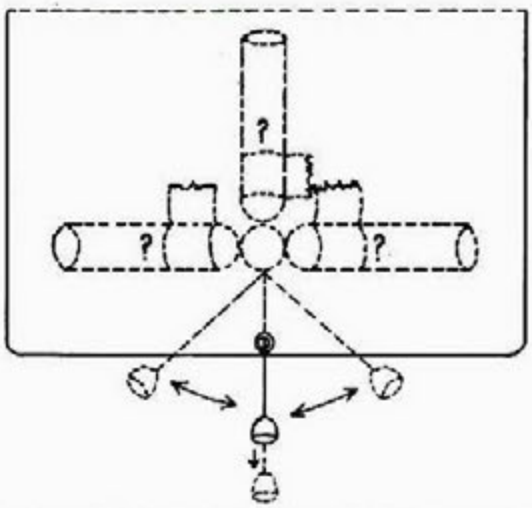
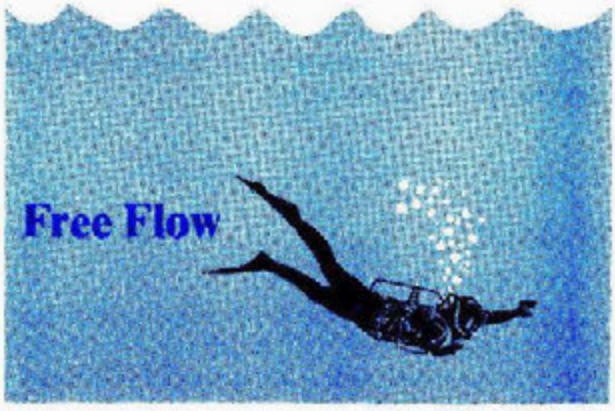


FIGURE 4-39

IT IS NECESSARY TO PULL THE CORD SIDEWAYS—AWAY FROM THE CARTRIDGE—TO FULLY ACTIVATE A HORIZONTALLY MOUNTED CARTRIDGE.



IF HIDDEN BY A FLAP OR POCKET, YOU CAN'T BE SURE HOW THE CO, CARTRIDGE IS MOUNTED, SO PULL THE CORD DOWN, THEN BACK AND FORTH FROM RIGHT TO LEFT LIKE A PENDULUM, COVERING ALL POSSIBILITIES IN ONE QUICK MOTION. THIS WILL BE EASIER AND SURER IF THE CORD HAS BEEN UN-THREADED FROM THE GROMMET.



In the April issue, we erred when we wrote that the U.S. Navy tables provide only 20 minutes of bottom time at 100 feet; the correct figure is 25 minutes. We used the figure to show the inaccuracy of the SOS meter, which at 100 feet gives 26 minutes, still a minute more than the tables permit.

Talking like Donald Duck on a helium and oxygen mixture is not funny business to a speech researcher at the University of Florida. Dr. James Hicks is trying to understand and develop an approach to decode helium speech to save lives. He says that "two divers were recently found dead when their diving bell was pulled to the surface. They may have been saved if the people in the support ship could have understood what they were saying. As it turned out, the divers were opening and closing the wrong valves, creating a lethal mixture of gases in the bell, something those above would have realized had they been able to understand them."

In Siskiyou County, California, the County Sheriff recently proposed an ordinance to prohibit ice diving after a 31-year-old diver drowned, failing to use a safety rope to guide him back to the hole in the ice. The County Board of Supervisors rejected the request when Deputy County Counsel told the supervisors that "the board lacks authority to prevent adventurous people from taking chances, such as ice diving or climbing 14,161-foot Mt. Shasta in winter."

If you're looking for a means to make a buck at sport diving, follow the lead of John Webber. Webber has retrieved nineteen supermarket carts from a lagoon near Foster City, California. Supermarkets are willing to pay a good price for the carts, once cleaned up, since new carts are worth about $90 each.

We've had our share of bad dives, but the report from a group of British Subaqua Club Divers in the January issue of the Club's *Diver* magazine caused us to count our blessings. Members of the Penzance and Zennor Club had been looking forward to diving lovely Loch Buildhe, according to Club Chairman Stanley Tees, and when they finally secured permission from the owner, Lord Dougall, club members "drove 700 miles north, climbed 3,000 feet, put on our gear, and then found the loch is only six inches deep. We all felt very depressed," he reported. Well, at least no one came home with the bends.

A 100-foot tugboat capsized recently in Hood Canal, Washington, trapping a crew member in a partially filled compartment. Rescuers heard tapping on the hull and sent divers in the tug with a spare tank; they led the survivor out through 20 feet of black water. The survivor, having no teeth to bite down on the mouthpiece, had to hold it in his mouth with both hands.

The U.S. Government has recently awarded a patent to Stephen Hendry of La Costa, California for the design of a 35-pound standard sized scuba tank which has a 285-foot capacity as compared to the standard 71.2-foot capacity. One tank is to be filled with liquid nitrogen, the other with liquid oxygen, which combine to produce a 60 percent nitrogen and 40 percent oxygen mixture. A regulator controls the pressure; any imbalance immediately activates a shuttle valve that shuts down the system and switches to a reserve tank, and a whistle alerts the diver if he is on emergency reserve. The inventor believes there is a market for commercial and sport divers and claims that not only will bottom time be greatly increased, but also the cost of filling a tank, at today's prices, will be only $4. Hendry, who has been a diver for 18 years, invented the system because, he said, "I got tired of having to carry heavy tanks around."

Four Texas divers perished in a cave in northwest Florida in mid-April; their bodies were recovered beyond a stop sign which had been placed there by other cave divers to prevent novices from traveling too far into the cave. About six Florida residents die in their state's underwater caves each year, but an average of ten out-of-state divers also die in caves.

Puget Sound, in Washington, is filled with marvelous marine creatures, but the only abalone found there is the pinto, which has never tempted the palates of ab lovers. Nearly 20 years ago the state planted thousands of the giant California red abalone, a delicacy which currently sells for $15/pound, in Puget Sound but not much happened and the project was forgotten. Recently, however, divers have been finding a tasty hybrid and the project may be a success after all. A few ab divers have already sold a few on the sly to local restaurants.

Farther north, in Prince William Sound, Alaska, commercial divers are collecting herring roe. In April about 400 converged on the Sound to collect roe which they could sell for 14-20¢/lb. Last year's rates reached as high as 75¢/pound. Once it gets to Japan, its primary market, the tab skyrockets to as much as $42/pound.

Another secret for making a buck in the diving business, at least for manufacturers, is to diversify a product line so that if the underwater market takes a dive, other sales can be counted on. Oceanic Farallon, calling itself Farallon Industries for other markets, has recently come out with a wide-angle mobility light for people suffering from night blindness or tunnel vision. The light, which is their diver's light fitted with a different bulb for a wider light spectrum, is worn on the waist strap and carried low to the ground to highlight uneven terrain and obstacles.

invite a buddy along. . . .

Why not share your UNDERCURRENT experience with a good friend? All you have to do is write his or her name in the space provided below and return the coupon to: UNDERCURRENT, 2315 Broadway, New York, NY 10024. Or, if you'd rather not cut up your issue, write out the names and addresses on a separate piece of paper. When we receive these names, we'll send along a FREE sample of the current issue with your compliments. Send along two or more names and we'll add an extra month to your subscription to repay you for your thoughtfulness and effort.

Please send samples of UNDERCURRENT with the compliments: _____
to the following: (Name & Zip number)

Name _____
Address _____
City _____
State _____ Zip _____

Name _____
Address _____
City _____
State _____ Zip _____