undercurrent®

THE PRIVATE EXCLUSIVE GUIDE FOR SERIOUS DIVERS

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P.O. Box 1658, Sausalito, California 94965

Cable Address: Gooddiving

Critique of World-wide Diving, Part II

A summary of readers' experiences.

Nearly exhausted and bent from our maelstrom tour of spots A to H, I've gathered you here today for round two of the critique of worldwide dive spots. So far, most correspondents agree with our observations, but where there is dissension in the ranks we'll so indicate in a future issue. Because Undercurrent takes up to six weeks for delivery (it's normally mailed about the last day of the month of the issue), we'll give everyone adequate time to poison and poise their pen, then run a reader review of our reviews--if enough readers write. Now my friends, Part II, a summary of experiences beginning with Indonesia, of divers who have gone before you.

INDONESIA: Islands everywhere, but so far as we can tell the only dive shop is on the island of Pulau Putri. Diving gets absolute raves, the local food is exotic and scrumptious, and the accomodations rustic and adequate. Apparently all the dives from the shop are beach dives (they have tanks and a compressor), but boats may be available.

ISRAEL: Diving at Eilat is considered very good, with plenty of fish, corals and sponges, and no where near as many sharks as people say. Willie Halpert's Aqua Sport's is a complete shop with rentals, can handle groups, and is next to Caravan and LaRomme Hotels. Beach diving excellent. Diving even gets better the further south you go; most who go recommend signing up with package tours to hit these areas.

JAMAICA: Montego Bay diving has long been overrated, but better in Negril, though still average + (see Undercurrent, August, 1975). Here, Sundowner Hotel remains the lay back retreat. Due to scores of political deaths in Kingston (three hours by car from Montego Bay), MoBay seems nearly deserted, some of the dive shops closed and others unpredictable. Sunken city of Fort Royal is not available for tourist diving. Forget the whole place.

MEXICO: In a March 24 letter to Russell Thompson, the President of the Underwater Society of America, the Mexican Government announced a new program to support diving. After being off limits to divers for three years, the Coronado Islands off Baja have been reopened and permits for diving are being issued. Spear fishing anywhere in Mexico is permitted only with rubber powered guns. Eight species are reserved solely for the Mexican fishing industry: oysters, abalone, lobster, shrimp, turtle, Pismo clams, totuava, and cabrilla.

INSIDE UNDERCURRENT

No coral may be removed. Lew Fead, energetic editor of the San Diego Diver's Log, warns that if divers and spearfishermen don't follow these important Mexican laws, expect to be restricted from Mexican waters.

Costs of diving in Mexico have been reduced due thanks to peso devaluation. Except for Cozumel, Mexican guides stay in the boat and pay little attention to divers, so beginners be prepared. All spots listed have tanks, belts and packs. The main problem in visiting Mexico is that Americans return home with bad stomachs. Go prepared.

Acapulco: Low Visibility and the quality of fish life and coral is dependent on where you go. Play other games in Acapulco and dive only if the bullfights or Rebecca's get too boring.

Baja: Undercurrent reviewed diving and camping in Baja in the August, September, and October 1976 issues. For those who are equipped to dive Baja, they experience truly the unique - a bizarre combination of tropical and cold water diving. One can fly to Cabo San Lucas to dive, but remember the day-to-day unpredictability. Air and tanks are available at Hotel Cabo San Lucas and the Hacienda. For diving the rest of Baja, your own compressor is nearly essential.

Cancun/Isla Mujeres: The reviews are mixed, but the area surely takes a back seat to Cozumel. You are probably better off taking a boat to Isla Mujeres where the Mexican Divers run an acceptable operation. Diving is secondary to vacationing, but you might get a peek at the famous sleeping sharks, if someone will take you.

Cozumel: What Aspen is to skiing, Cozumel is to diving. Not the best, but quite good and everyone goes there. Although it takes all day for a two tank dive, the colorful reef and adequate, but not abundant, display of tropicals in clear water is worth the trip. Cheap hotels and $1 taco dinners can make this the least expensive trip out of the U.S. for low budget divers. Aqua Safari and Julio Blanco are preferred, and Dive Cozumel's ok too. See and Sea tour offers more and better diving, but their tab is high.

Puerto Vallarta: Charming resort town and worth a dive or two when you're wise enough to go light on the tequila the night before. Visibility averages 30-50 feet. There are few spots to dive, so it's no place for a dive vacation. See Undercurrent, October, 1975.

Tijuana: All the dives you want, but there's no diving.

NEW HEBRIDES: Limited information, but appears to be among the best anywhere. Apparently air is available, but not guided tours. Bring your own gear.

MICRONESIA: The wrecks of Truk and the Reefs of Palau and Saipan are, shall we say, marvelous. Although divers can make it on their own, most are more comfortable to join the standard tours being operated by See & Sea, Poseidon, etc. Guam diving does not compare with other islands, so Coral Reef Marine Center runs its own excursions to the other islands. It was all reviewed in Undercurrent, November/December 1976, and January, 1977.

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PANAMA: Limited information, but the few reviews are overwhelmingly positive about the plethora of fish and unspoiled reefs, including "shells galore". Moody's Pidertupo Village on the San Blas Islands has a compressor and tanks, and very primitive living conditions--divers love it.

PHILIPPINES: Fish, coral, and shelling are excellent about an hour or so from Manila, away from reef dynamiters. Some new sites being discovered. Divemasters, a well rated shop in Manila, is run by Americans. They also run a unique dive camp. Bunn's also good and well equipped in Makati Rizal. Best diving time apparently is December to April.

PUERTO RICO: Diving out of San Juan can be interesting if you have other reasons to be in San Juan, but no place to head just to dive, unless you wish to explore the coast on your own. The dive shop at the Hyatt Hotel has proven to be preferable to the shops at the Sheraton or the El San Juan. Diving gets better in other parts of the island (e.g., the off shore island of Culebra), but apparently there are no dive shops or guided tours. Visibility runs around 50 ft, ± 20 ft.

ROATAN, HONDURAS: Responses out of Roatan are always mixed, due mainly to the inconsistency of the hotels and dive operations. Although there are plenty of divers who are delighted with the fish, sponges, corals and general diving conditions, several report that their guides just didn't take them to the best spots. Anthony's Key seems the preferable hotel-resort and the most consistent. Reviews are mixed about Spyglass Hill and the Pirates' Den. Prepare yourself because Roatan is difficult to get to and primitive, but the diving is hot; the devotees will not be denied. If you don't dive, bring plenty of books--there's little else to do, although Anthony's has tennis courts and is a nice retreat.

ST. MAARTEN: Not for diving except as a side activity (see Undercurrent, June, 1976). Limited sites, rough water, and average underwater scenery. There's the possibility of future full day boat trips to Saba and St. Eustasius, where diving is reputed to be considerably better. If so, we'll have to take a second look at St. Maarten, the "in" vacation isle for jet set groupies.

SEYCHELLES: Limited data, but apparently nothing special. Air available and Time magazine said the same about the surplus of local women.

TAHITI: Information is spotty, but if one travels on a tour such as the See & Sea tour, the possibilities are indeed positive.

TOBAGO: Some exceptional diving at the Blue Waters Inn, but experienced divers occassionaly have to genuflect to beg the guides to take them to the better spots. The constant current makes this a place better suited for the experienced. Large groupers still around the reefs, unlike many other Caribbean retreats where they've run from the spear. The Inn is isolated, rustic and comparatively inexpensive.

TURK & CAICOS ISLANDS: A cluster of Islands on the southern most tip of the Bahamas; three seem to offer impressive near-virgin diving but winds keep waters rough many months of the year. Diving on Grand Turk is out of the Salt Raker Inn (hotel rated "acceptable") and divers find plentiful fish, corals and usually 75 foot visibility. The reviews are quite similar for the Admiral's Arms on South Caicos and a little less spectacular, yet still good for the Third Turtle Inn on Providenciales. Each has guided boats, tanks and a compressor. Several divers complained that the Admiral's Arms short-changed them on air fills.

TO BE CONTINUED NEXT MONTH

Southern California Charter Boat Diving:

Extraordinary, unique, and cold. . . and not for turkeys.

From every state divers have written to malign us for not reviewing diving in their local quarry. I don't apologize. Our purpose is to review potential vacation sites so traveling divers can get what they expect and what they pay for. Not many divers fly into Idaho for a week on the reefs or drive through the night for a dip in Galveston Bay. So you won't read about those spots. We've come to learn, however, that many divers head to Southern California for vacation diving. And when they hit the water they are surprised, some pleasantly, others unpleasantly, because Southern California diving just ain't no tropical safari.

So, we've decided to review the waters of our southern siblings and for the hearty we'd like to indicate that there's some pretty fair diving. But, hear this: The surface temperature varies between 54 and 70 degrees, and just as you descend rapidly, so does the temperature. A full ¼" wet suit or dry suit is mandatory. And when you're finally below, you'll swim between strands of kelp in a jungle so thick even Tarzan would have difficulty passing through. Visibility can run from 20 feet to 100 feet, with 50 more likely, but even in thirty foot visibility, buddies ten feet away can disappear among the thick fronds of kelp. Kelp diving is cold and beautiful and potentially dangerous. It's not for turkeys.

Southern California professes to be the birthplace of sport diving. While this may be contested, it probably is the major diving area in the United States. Some claim that one-fourth of the nation's active divers are located between Bakersfield and San Diego. This concentration of divers and diving activity is a blessing for traveling divers who visit this area on business or vacation. There are numerous dive shops well supplied with rental equipment, hotels and motels in all price ranges, and Disneyland for the non-divers.

A major benefit of this high concentration of divers has been the development of a small but highly skilled dive boat industry. Some 20 boats operate regularly along the California coast: 3 out of San Diego; 9 out of San Pedro, which is the Los Angeles harbor, 6 out of the Ventura-Oxnard-Port Hueneme-Santa Barbara area, and 2 out of Monterey. With the exception of the boats from Monterey, this dive fleet works the Channel Islands and portions of the Mexican coastline. The Channel Islands are a chain of 8 islands stretching from north of Santa Barbara to south of Los Angeles. Most are as distant from the mainland as Santa Catalina, 26 miles across the sea. Boats from the different harbors travel to specific islands, although some 5-7 day trips occasionally visit all the islands. From San Diego, boats visit San Clemente Island and head southward into Mexican waters. San Pedro boats go to San Clemente, Catalina, San Nicolas and Santa Barbara islands. Boats from the Ventura-Oxnard-Port Hueneme-Santa Barbara area go to Anacapa, Santa Cruz, Santa Rosa and San Miguel islands. These islands have sustained diving interest in Southern California and it is to these islands that the traveling diver should direct his attention. Massive kelp forests support and protect a wide range of sea life, creating an environment which is exciting for the sightseer, the hunter, or the photographer.

Getting aboard a dive boat can be tricky. It is possible to drop into L.A. and be on a boat the next day--possible, but highly unlikely. These boats are chartered by a club or dive shop and only they can sell space. However, three boats at San Pedro operate "open" or modified "open" boats: The TRUTH, The WESTERLY and The BLUE SEA. The BLUE SEA has a modified open boat in that all space, on noncharter days, is sold through a dive shop. None of these 3 boats are open on the weekends.

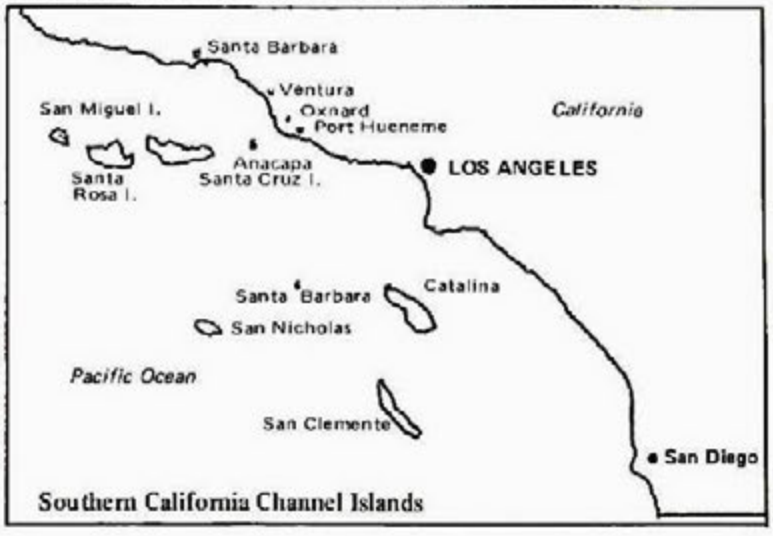
It takes planning to find space; allow a minimum of two weeks, and a month, if possible. Call the boat or booking number to find out if the boat is going out that particular day and if it is chartered or "open". If it is not "open", ask for the name and phone number of the person chartering it, call and make whatever arrangements you can. You may have to call more than one boat to secure space because first chance goes to club members or shop customers.

Once you have secured space aboard one of these boats, there may be a logistical problem to solve. If you plan to dive from San Pedro or Santa Barbara, you have to go to a shop to rent tanks because most boats do not supply tanks, nor weight belts, nor other gear, but most do sport a compressor. Check before renting two full tanks or one empty one. If you rent from a dive shop, you have to figure out how to return the gear. For example, if you arrange for a typical two day Saturday and Sunday trip, pick up your gear and board the boat on Friday night about 10 P.M. (the boats travel at night for early Saturday diving). When you return at 6 P.M. Sunday evening, the dive shop is closed. If you're lingering in the area for a few days there is no problem, but if your plane leaves at 8 A.M. Monday morning, you have a problem.

Along with your full wet or dry suit and other gear, you must have a submersible pressure gauge. Since the 1974-75 efforts to legislate diving in L.A. County, boat skippers require the gauge and a "C" card; don't leave these two items at home. In addition, I take along several towels and a couple of sheets. The boats that leave in the middle of the night have bunks, pillows and blankets. The locals take sleeping bags, but I find that sheets take up less room and, for me, are more comfortable.

In many respects boat diving is often more difficult than shore diving because of swells, surge, currents and rapid weather changes. Nevertheless, most boat trips are within the capability of most certified divers. As a rule of "thumb" any dive trip to the "front side" of an island is considered easier than a trip to the "back side" of the same island. The "front" is that portion of an island which faces the mainland. The "back side" faces the open sea. The "front" is usually, but not always, protected from heavy seas, swells, surge and current. Conditions may vary day-to-day and what is usually an easy dive can become difficult or impossible. Catalina and San Clemente are both good islands to dive and offer sheltered areas so that everyone has a chance to dive. Several dive shops use the "front" of Catalina for student check-out dives.

During the day, most boats will move at least twice. The first dive of the day is usually 60 feet or more and the remainder shallow, or at least with a shallow option. This allows the skippers to exercise some control over decompression problems and at the same time making sure that everybody has a chance at water they feel they can handle. In one site at Catalina our boat's bow was anchored in 50 feet of water, and the stern hovered over a bottom 120 feet away. Overall, the diving varies from 10 to more than 200 feet, from sheltered coves to open ocean, and offers the most beautiful and unique diving you may ever experience.



Southern California Channel Islands

The charge for the trip will depend upon the distance the boat has to travel. A 2-5 day trip will

work out to be cheaper than a one day trip because of the distances involved. You can figure on about $20 per person plus air fills and any food you purchase for a one day trip to Catalina (26 miles). The most expensive one day trip, at $32 plus food and air, is to Begg Rock, about 70 miles out. While these costs are from San Pedro, the prices are comparable for boats out of San Diego and the Santa Barbara areas. If you take a 2-5 day trip, food and air fills are included in the quoted prices.

Once the trip starts, weather may force a change in destination. But don't let that bother you. The skipper will head for some sheltered area and you should still have good diving. When the boat reaches the dive spot, the skipper will announce where you are; what depth the boat is anchored in; what the surrounding area is like; and, any conditions which you should know about. If you miss any of the announcement or have any questions, ask the skipper. He knows the areas and is there to help. Dives are not guided, so you'll need to pair off with an experienced buddy if it's your first time in kelp. You'll have no trouble finding one since the boats carry from 18 to 50 divers.

NEXT MONTH: We'll review trips we've taken and recommend the better dive sites in the Islands. We'll tell you exactly what you can expect to see, and then give a complete up-to-date listing of the charter boats and how to contact them.

Diving for Science . . .

and tax-deductions, too!

The scene is set in the Bahamas. The Out Islands. The divers are working this day at 60 feet. They must identify the many species of coral that make up the reef and, using tape measures and meter sticks, record the exact measurements of each variety on underwater writing slates. One diver's attention is diverted by a jewfish hiding among the remains of a nearby 19th-century wreck, but he is soon busy again with the work at hand.

The expedition is led by a marine biologist from Key West, Florida. A precise map of the reef will be drawn from the measurements taken below, and this will help determine how the coral is reacting to man's impact on its environment. But there is something odd about this research team. The science is for real, but the scientists are not. One is a dentist from Indiana. Another is a school teacher from New Jersey. And a third is a student from Wyoming. They have three things in common: they are all certified divers, they are on vacation and they wanted something extra from their vacation diving.

Photo by Jeff Rotman

Volunteer divers studying coral growth on a 1976 Earthwatch expedition in Grenada.

Looking for an Added Dimension . . .

To be sure, diving is in itself a sport of great variety. Each dive can be a new experience. But for a growing number of divers the Caribbean tourist experience alone is not always enough. They seek added dimension to their diving: something new to learn, some way to put their natural interest in the sea to purposeful work. For many of these divers the continuing expansion of scientific underwater exploration seems the ideal outlet.

A number of marine associations, such as the International Oceanographic Foundation (3979 Rickenbacker Causeway, Virginia Key, Miami, Florida 33149) and the American Littoral Society (Sandy Hook, Highlands, New Jersey 07332) sponsor educational trips on which dives are led by scientists who, with authority, can discuss new findings concerning underwater ecosystems and the effects of pollution. These can be interesting excursions, and the learning can be satisfying. But such dives still do not provide the opportunity to participate in the process of discovery, and in that sense, they differ only in degree from dives with the affable "Cap'n Don."

Unfortunately, opportunities for the sport diver to join scientific endeavors are not abundant. Not yet, anyway. Despite the fact that a good deal of field re-

search work need not be carried out by trained scientists, most marine research institutions limit their research teams to professionals. Furthermore, university-sponsored projects are usually open only to faculty and students.

However, a different approach to the organization of scientific expeditions was introduced in 1971 by Earthwatch (known until last year as Educational Expeditions International). Earthwatch brings together professional scholars who need financial and staffing aid for their expeditions and individuals who are willing to work and are interested in an extraordinary learning experience. The idea is to match the needs of science with the interests of the community. This may sound a little like a computer dating service, but, so far, it is proving more satisfying than any phone numbers ever printed out for me.

Twice each year Earthwatch publishes descriptions of expeditions that have been approved by its Center for Field Research. The projects are in a wide range of academic disciplines, from anthropology to zoology, and include several underwater expeditions. Individuals wishing to participate in one of the projects contribute between $500 and $900 for accommodations and supplies for a two- to three-week expedition. Getting to and from the site is the diver's responsibility. Technically, the participants are volunteers. Their contributions are used to pay for the project, so in most cases this and other expenses, including travel costs, are fully tax-deductible (see insert).

How to Participate

To date, over 1,500 individuals have gone on more than 200 Earthwatch expeditions throughout the United States and in 40 foreign countries. To participate one must be between 16 and 75 years old, and, where underwater work is involved, be a certified diver. That's it. All necessary training is carried out by the scientists leading the expedition. Earthwatch offers an exciting and unusual diving opportunity, but, as its West Coast representative Frank Arensburg is careful to point out, this is "no tour!"

Undercurrent subscriber Charles Eberle of Cincinnati, Ohio, would agree. He spent two weeks last summer studying the coral reefs off Grenada in the Grenadines with Dr. Mel Goodwin of Environmental Research Projects. According to Eberle, the lay-scientists learned quickly how to identify the various types of coral found on the reef. While he described the work as strenuous and the accommodations as "what you'd expect under field conditions," he was enthusiastic about the experience. "You feel you're contributing to marine knowledge." What's more, Eberle told *Undercurrent*, as work progressed the participants were also contributing to the methodology of the research as divers applied their own skills and experience to improve underwater working techniques. Eberle, who says he has always been interested in science, spent a long time thinking about the trip before taking the plunge. Is he happy he did? It's answer enough to know that he'll be back in the Grenadines again this year.

This summer, in fact, Earthwatch has four diving expeditions going out. There will be two more trips to continue the study of the Grenada reefs. Dr. Goodwin will also be pioneering research into the behavior of the hawksbill turtle. Hawksbills, which are an important food source and export commodity in the Grenadines, are decreasing in numbers. Dr. Goodwin's divers will be tracking the natural ranging and feeding habits of the turtles to determine whether plans to farm them under protected, controlled conditions are feasible. Two other teams will be diving in Plymouth Sound in England with Alan Bax, founder of the School for Nautical Archeology there. Commander Bax is surveying and collecting relics from a wreck at the mouth of the River Plym, relics that might be as much as 500 years old. Timbers and three small breech-loading guns have already been recovered from what appears to be an important marine archeological find.

In addition to its regular program Earthwatch offers fellowships to educators and has a competitive scholarship program for students. For more informa-

TAKING YOUR TAX DEDUCTIONS FOR CHARITABLE DIVING

If you work as a volunteer for a non-profit scientific, educational or literary organization, or for a government agency such as a local fire department, many of your expenses are probably tax-deductible. None of your new equipment costs are deductible, but equipment repairs, overnight lodging, meals necessary to the conduct of your volunteer work, telephone calls, some material and supplies and transportation charges to the work site (including seven cents a mile if you drive, plus parking and tolls) are most likely deductible.

When more than 50 per cent of a trip is devoted to volunteer work, the expenses chargeable to the volunteer work are deductible and a percentage of your airfare equivalent to the percentage of your volunteer time is also deductible. For example, if you take a 12-day trip with a non-profit organization and then spend three days playing along the way, 12/15 of the airfare is most likely deductible.

The tax law is complicated and new regulations passed in 1976 have reduced deductions in international travel. To be certain of your deductions before you depart, consult with both the sponsor of the activity *and* your tax accountant.

tion about all its programs write Earthwatch, 10 Juniper Road, Box 127, Belmont, Mass. 02178.

Other Programs Offered

There is hopeful evidence, too, that the Earthwatch approach is catching on. The University of California, Berkeley, has recently established the University Research Expeditions Program along very similar lines. In this case field research projects are all led by scientists from the university, although the participants need not be associated with the school. Any member of the general public may become an active member of one of the research teams. Unfortunately, none of the program's seven initial expeditions involve diving, but such marine research is expected to be included among the projects eventually.

Another exception to the general rule that research is for professionals only is the Oceanic Society Expeditions, the research arm of the Oceanic Society. Scientific expeditions sponsored by the society do take along novice researchers when space is available. This summer, for example, qualified sport divers will join the society's shark-tagging expedition off the coast of New Jersey. In addition to catching and tagging the sharks, divers will take environmental samples to collect data on plankton, pollution levels and so on. Later, non-scientists will participate in a project off the Maine coast to study marine mammal populations. Joining one of the society's expeditions will cost you between $300 and $500 per week, plus airfare. For more information you can contact Oceanic Society Expeditions at Fort Mason, San Francisco, California 94123.

And now Bob Citron, who founded Earthwatch, has a new idea—The American Adventurers' Association. This group functions as a clearinghouse through which members can learn about more than 2,000 "adventures" catalogued from around the world—from dog sledding across Greenland and bush flying in Alaska, to diving in the Red Sea. These are not all scientific expeditions, but Citron seems to have an eye for travel with an unusual bent. He tells us that the Association's listings will include an expedition with Ron and Valerie Taylor to tag white sharks off the Great Barrier Reef and dives with marine archeologists from the Athenian School to examine Phoenician wrecks in the Mediterranean.

Individual memberships in the association will cost $25 per year (charter memberships for $15 are available to those who join before October 31). Members will receive a monthly magazine and newsletter, and a copy of the association's *International Adventure Travelguide*. Members will also get discounts on travel booked through the association and on a variety of photographic and sporting gear. Write the American Adventurers' Association, Suite 404, 5200 University Way N.E., Seattle, Washington 98105.

If You're Still Looking . . .

A final note. Some of you may be looking for something new under the sun—or the surface—but are left flat by the idea of spending your vacation working your tail off on some scientific minutiae, or risking it on a white shark. Well, take heart. Your solution need not be quite so esoteric. The Steinhart Divers, for example, are volunteers who work with the Steinhart Aquarium in San Francisco. Their mission is simple. They catch fish for the aquarium. The divers say they love it and the aquarium's very grateful for the help. Divers in other parts of the country might contact their local aquarium or museum to determine if projects are being sponsored which can employ volunteer divers. And in subsequent issues *Undercurrent* will investigate other alternatives.

So, if your diving lately has you echoing the doleful plaint of Peggy Lee's "Is That All There Is?", the answer is, "It Ain't Necessarily So."

Note: Earthwatch is looking for skilled divers for summer and fall projects. Write Earthwatch for more details.

Ancient and Modern Reefs of Discovery Bay (September)

Coral Reefs of Grenada (October, November)

The Hawksbill Seat Turtle of Grenada (October-November)

Plymouth Ship Wrecks (July-September)

The author, Steve Baim, is a freelance San Francisco writer. Baim is at work on his first novel about an octogenarian diver who falls in love with a parrotfish. Unwilling to remove the fish from the ocean, the diver spends two years determining his favorite parrotfish's sex. At last the diver determines the fish is a female and lets his love flow, only to have the parrotfish switch to the male gender before his very eyes. The diver then . . . well, never mind. Baim has yet to find a publisher.

Panic as the Primary Cause of Diving Deaths:

Better training and self-recognition of body signs can save you.

Most divers believe they know why divers die. The cause is occasionally embolism, rarely the bends, and nearly always drowning.

But, do divers know what causes drowning? The answer should be no mystery, yet consider the report of the death of 34-year-old Paul Hazelwood April 26 at Monterey, California. The lead paragraph from the story in the *Salinas Californian* says: "An air embolism was the apparent cause of death of a San Francisco diver rescued Saturday morning. . . ."

Later in the story a Coast Guard spokesman explains that Hazelwood was diving in 30 feet of water when "he apparently lost the mouthpiece of his regulator, panicked and shot to the surface where he became entangled in kelp."

Or consider another diving death on the same day 3,000 miles away. According to the April 26 issue of the *Tampa Herald Tribune*, "a 26-year-old man drowned off Bradenton Beach Friday in his first attempt at scuba diving. Police said there was no immediate explanation of why the man . . . died in eight feet of water with a tank full of air and all his safety gear intact." The man was found "sitting on the bottom, about 60 feet offshore, with his air hose out of his mouth and his mask pulled down. His tank was operating properly and still contained air. He was wearing an emergency life vest that inflates with carbon dioxide instantly when the diver pulls a release cord. The vest had not been used. When police tested it later, it worked perfectly."

There probably is an explanation as to why this fellow died the first time he donned scuba gear, and that explanation comes from the friend who had tried to save him. "The only thing I can figure is that he got down there and panicked."

What It Is

Panic is a state of unreasoning fear in which the person acts counter to his training and self-interest for survival. In this condition of excitement the higher centers of the central nervous system relinquish control; and the more primitive portions of the brain, together with the emergency nervous system, take over. A human tends to act like a lower order animal desperately struggling to survive. Primitive movement and escape patterns dominate his behavior.

A diver in such a state loses control over his thinking, cannot elect to follow his training or the rules he's learned and resorts to a desperate physical struggle for survival. Activity for which the diver has been trained —presumably now-automatic activity such as dropping a weight belt or inflating a BC—can be undertaken in the early stages of panic, but in the later stages very little can be done to avoid the primitive struggle.

Panic is not a primary response pattern of humans, but is a late response to a sequence of events which must occur in or cause a stressful situation. What is stress to one diver may not be stress to another. The situation usually carries with it some degree of strangeness or even may be totally foreign to the diver. Thus, the diver with more diving time and a greater array of experience than his less experienced counterpart will tend to be less susceptible to stress and therefore to panic.

Situations producing stress in a diver include believing he is "too deep" (obviously, this will vary according to experience and other variables), shortage of air, sudden disorientation, being quickly caught in a fast current, and so on. The common thread among divers in panic is the overwhelming sense of not being in control of one's self, of one's circumstances, or of one's equipment.

Under these terrorizing circumstances, the diver—as any human in terrorizing circumstances—girds himself to survive. Involuntarily, his breathing increases rapidly. Eyes open wide and dilated pupils dart about. The heart beats much faster. Blood vessels in the gut constrict and shunt blood to the limbs. The diver's body is responding as if it were about to operate without a functioning brain.

The diver's ability to function skillfully is seriously reduced. Clutching fingers and awkward limbs do not work well with equipment designed for fine movement such as a weight belt buckle. What can't be seen—for example, equipment attachments and releases hidden from view by a flopping BC—can hardly be manipulated.

This is an extreme description; the reader must also recognize that anxiety or tension states differ from panic. Anxiety, in fact, can be useful to tune up the body and provide preparation for more serious encounters. Anxiety produced in stressful training can help a diver familiarize himself with his own responses. Certain procedures can be trained into the diver, permitting him to gain more self-assurance and self-control.

What to Expect

Our intent in this article in describing and explaining the phenomenon of panic is to familiarize the diver, especially the novice, with the reactions he can expect. Of course, discussing and experiencing these phenomena in the controlled setting of training is the most important way to learn the responses and to determine how to take care of oneself. But many instructors fail to have the student understand and internalize the elements of panic, fail to put divers through stressful situations or train divers in responses to early panic. For some people, scuba training may be their first introduction to their own personal elements of panic. Recognition of their body responses is the first step toward mastery. Each beginning diver needs this as part of his training so that he becomes aware of his own physiological patterns, accepts them, and then handles them in such a way that he can control himself.

The safe diver doesn't dismiss the signals or succumb to them, but the diver searches his mind, his body responses and his situation to determine what he is finding threatening or dangerous. He does not construe his body signs as "foreign," or "bad," or "embarassing" or "shameful." He trusts himself, his intuition and his willingness to take care of himself in situations he determines are adverse to his own safety, recognizing that someone else may not consider the circumstances in which he finds himself unsafe or panic-inducing. He knows that his responses are perfectly o.k. and he is free to take care of himself and remove himself from the situation he finds uncomfortable.

He realizes that diving is not a game of "underwater chicken" and that it is all right to be the first to recognize early signs of discomfort which might lead to panic and to extricate himself from those circumstances. Most important, the safe diver who recognizes the signals is free to solicit help from his buddy, without fear of reprisal, without fear of being laughed at, and without fear of embarassment.

We surveyed over 100 divers about their general and specific experiences relating to panic. Although our work is still continuing, the data we have gathered can be of great help to any diver, novice or experienced, and especially to instructors. We urge you to read this article carefully.

Sixty per cent of the respondant divers reported their self-awareness of apprehension or tension prior to a dive, and half of those reporting the "pre-dive jitters" had five or more years of diving experience. We suspect that many more divers may be embarassed about accepting their anxiety, but it's important for the novice, particularly, to recognize how widespread is the anxiety phenomenon, even among very experienced divers.

A majority of the divers (54 per cent) reported no life experiences prior to their diving training which had produced panic. This high incidence of unfamiliarity with body responses in panic situations indicates that many divers in trouble may experience the symptoms of panic for the first time in their lives while under the surface of the ocean.

Inadequate Treatment of Panic in Training

A majority of the reporting divers considered their instruction in panic training inadequate, although in all training situations there are fertile and frequent opportunities for encountering and managing panic in a controlled environment. And while most divers viewed their training as inadequate, 61 per cent reported panic, and 36 per cent of these also witnessed others experiencing panic in training.

Surely it is important to provide stressful situations in training, but trainees should receive adequate classroom and pool work to understand pre-panic states and learn to take care of themselves to avoid panic. This high incidence of panic in training suggests that students were not sufficiently prepared to avoid panic and that conclusion is supported by the 61 per cent of the divers who believed their panic training to be inadequate.

Although diving equipment is initially strange and counter to human instinctive patterns, it cannot be assigned the blame for inducing panic. Less than a third of our divers reported serious problems with their equipment during training.

Yet equipment does play a critical role in training, and the way a diver uses his equipment will affect his ability to manage himself under water. Divers need to be taught, and subsequently believe, that "a diver is still in training until he understands that his equipment works for him, and that he does not work for his equipment." If the trainee finds himself still frequently checking and rechecking his gear before entry and then checking again and again once under, he is laboring with his equipment, he is not trusting his equipment, or his own recognition that everything is working. His behavior is a symptom of tension, of worry—a precondition of panic. His equipment is not serving its purpose—to enable the diver to relax, to be part of the ocean, and to enjoy it fully.

More important than the alien nature of the equipment is the substantive material imparted by the instructor. **It seems that the verbal content of instruction did not get through to most trainees.** We learned this through questioning the divers about their security feelings with regard to their trainer. Although the instructors seemed to rate generally high with regard to confidence, skill and assurance, they did not rate so well in imparting the substantive content of the material. Many students left training without sufficient understanding of their responses to panic.

A major training component inadequately emphasized by many instructors is the open-water training and check-out dives. Seventy-four per cent of the non-pool or "real diving experiences" of our respondents took place in lakes. Are lakes adequate? Under what conditions should the initial open-water training dives take place? How many dives should there be? Should they be in water deeper than 30 feet? Should there be one or two trainees with the instructor? Should older students have repetitive descents and ascents as part of the first dive in open water?

More than 75 per cent of our respondents emphatically indicated the high importance and value they place on such experiences, and 64 per cent of the trainees believed their open-water training to be inadequate.

We suggest that it may take up to 10 open-water dives before a student feels free from tension. Yet, in our sample, 58 per cent of the divers who were certified had either *none* or only *one* open-water dive prior to their certification. That is a startling figure in light of the results of the University of Rhode Island study of scuba deaths. Researchers Hilary Schenk and John McAniff found that seven per cent of the fatalities occur on the first open-water dive and 23 per cent occur on an early one.

Another variable needs emphasis. Divers trained in one area may have serious difficulty when they take their first few dives under different circumstances. Most obvious is the potential difficulty of the diver trained in warm water like the Caribbean who then takes his first dive in, for example, the Pacific Northwest or off the New Jersey Coast. The different body sensations and encumbrances of the hood, the full wetsuit, and thick gloves can lead to a constricted feeling and subsequent discomfort which can significantly increase tension. Mixed with poor visibility, cold and fatigue, and the fear of kelp entanglement, the novice may develop a high level of anxiety, a pre-panic stage. Those who teach in warm water areas surely need to underline the necessity for their students to seek additional training if they wish to dive in alien environments.

And divers who learn their skills in placid lakes or pools need to be retrained for Caribbean currents, California surf entry, or boat diving in rough seas off the Florida coast. These alien circumstances can indeed produce anxiety.

Our data also suggests that older divers were less in touch with those body signs, indicating high levels of anxiety, and need more training in panic management than younger trainees. Because older divers may not be as physically responsive to some panic-inducing situations as younger divers, they may find themselves panicking because their bodies just don't respond as quickly or as strongly as is required. We believe that older divers should be given special attention in understanding their responses to tension and panic and should receive more repetition of basic exercises in diving.

Post-Certification Panic

After certification, 61 per cent of our respondents faced a life-threatening situation when diving. These included being short on air below 60 feet without a buddy nearby, having a faulty pressure gauge, being caught in a strong current, and struggling on the surface far from the boat or shore. Despite the potential seriousness of the situation, only 14 per cent reported panic as the major response. However, upon closer questioning, an additional 22 per cent admitted a panic response, meaning more than one-third of the divers found themselves in a situation to which they responded with panic or near-panic.

As we indicated earlier, panic is a primitive response in which a diver fails to perform as he has been trained and resorts to a variety of counterproductive behaviors. Of those divers we indicated had experienced panic, 42 per cent failed to drop their weight belt, 31 per cent raced for the surface, 29 per cent failed to inflate their BC, 29 per cent did not jettison their tank, 22 per cent later found air in their tank, 22 per cent ripped off their mask at the surface, 10 per cent took off their mask underwater, and 14 per cent failed to turn to their buddy for aid. These divers were mainly aged 25 and older.

Most of the divers could not determine the personal factors that might have triggered their panic response, although they could objectively list what they considered the main components or problems connected with panic. **Seventy-nine per cent thought the lack of training or experience after certification played a major role in their panic response.** Exceeding acceptable limits, such as those established by dive tables, was the next most frequently mentioned factor.

The Role of the Instructor

The instructor tends to represent an authority figure to the trainees and the students are generally eager to listen. The instructor must help develop within the student certain attitudes that protect him from panic– calmness, knowledgeableness, assurance, awareness, alertness and pleasurableness. An instructor modeling this behavior will be identified with by most students and the students will tend to incorporate these notions into their own self-image as divers.

This unconscious identification process serves as underpinning necessary to master scuba equipment. The student just "knows" it is possible to dive well since the instructor has been his model. He realizes the instructor possesses extensive book and experiential knowledge which is integrated into his underwater behavior. This image of the instructor serves as a model to be pursued by the trainee.

Affecting the trainee's progress are images and fantasies of what he will experience and how well he will handle himself. Fears and anticipations, both negative and positive, rise from within. A goal of training must be to transmit both scholarly and practical information to the trainee within the frame of his preset self image as his image undergoes change with the program.

One effective method for handling the less conscious aspects of training is to discuss these ideas in groups of six or less. Group members should be instructed to talk about how they *feel* about the training they have so far received and to deal with the tension and anxieties present in themselves in each step of the training– particularly in such exercises as ditch and recover, buddy breathing, emergency ascent, etc. The instructor should encourage open discussion of the self-recognition of early signs of tenseness and anxiety and how they and others deal with the same phenomenon. The widespread notion among trainees that the equipment just isn't correct should be discussed; trainees can be brought to understand that it may not be the belts and buckles and bulges that are troubling them, but rather their equipment worries have become projections of their overall anxiety about diving.

The instructor can emphasize that 60 per cent or more of the divers (as our survey showed) respond to life-threatening situations with non-panic behavior, pointing out that tough situations are likely in scuba diving and handling them calmly can become routine.

It may be that a number of people who undertake scuba training–particularly the older–have not learned the techniques of relaxation in the hectic and trying world of the '70s. The instructor can help his trainee practice relaxation exercises in which they learn more about breath control and large muscle mass relaxation. Many students might find that practicing a specific routine or procedure, say, for example, just before entering the water, may help them enhance their self-control and confidence. Training groups can mentally rehearse procedures to help them handle certain situations. Students can be led into a quiet, relaxed state with their eyes closed, and then be asked to rehearse mentally handling problems such as being out of air, dropping the weight belt, exhaling to the surface, etc. That rehearsal can only enhance the diver's ability to face these problems successfully in the ocean.

In inducing these feelings among small groups, the instructor can walk from group to group, asking for information and feedback, and listening to the anxious and tense experiences of his students. It's important for the instructor to listen, not to defend, because listening carefully is the only way to develop styles best suited for training the students to overcome panic

and react in a life-saving manner.

Understanding More About Yourself

Two phenomena are worth noting about humans as divers. One is that throughout our years of study into the psychological complexity of humans, we've learned how difficult it is for people to let go of things in life. This can mean money, unrealistic dreams of the future, children who have grown up, spouses . . . and weight belts. The psychological reasons to hang on obviously must be overcome by the intelligent decision-making of the diver facing a hazardous situation. From our data, it is clear that many divers cannot bear to let go of their weight belt—and that can mean letting go of their lives. Obviously divers, and students, need to understand the implications of such behavior so that in those moments of decisions they can overcome their own predispositions.

Second, diving and equipment are indeed alien to man. Man is a nose-breathing animal and to restrain the use of the nose in respiration—as does the mask—is quite a departure from our evolutionary progress. It requires retraining. Similarly, adding alien equipment to our body for survival requires reconceptualization of one's own body image. Consider how one feels when initially learning to drive as he clutches the wheel of the alien vehicle. But when driving becomes natural, the driver perceives the automobile as an extension of himself and drives with his subconscious, often unaware he is even turning the wheel of the car. The analogy easily fits the beginning scuba diver struggling to overcome the alien nature of his equipment, while the experienced diver hardly knows he's loaded with weights, tubes and straps, as he glides easily through the coral caves.

And, the older the diver trainee, the longer it takes him to become acclimated to his life-support systems in a new environment, to develop the union of the equipment with his psychological self so that the tank on his back, and the regulator in his mouth, and the fins on his feet become him, not alien, foreign objects.

In conclusion, the successful and safe diver is in unity with the ocean. He is comfortable, confident, and able to take care of himself. He is at peace with his equipment and, in fact, uses the equipment simply as an extension of himself. He does his own thing underwater, while still being fully cognizant of and responsive to his buddy's needs.

Such a diver is free to enjoy fully the flow experience of diving. He will avoid situations that he can't handle, and calmly get himself out of trouble should he face difficulty. Hopefully, as you read this, the description fits you.

Undercurrent Comments:

We find Dr. Kraft's study and analysis provocative. From his conclusions we would like to raise a number of serious questions about training and certified diver behavior for consideration. For example:

- Should a diver certified in Florida be permitted to get air in New Jersey without a prior check-out dive?
- Should a set number of ocean check-out dives —say 10—under the watchful eye of an instructor be required of all certified divers before those divers are allowed to buy air for ocean dives?
- Given the limited amount of time most instructors give to diver psychological training, is there justification for teaching beginners the mathematics of gas laws? Of devoting a classroom session to memorizing equations? Or studying how a compressor works?
- If building confidence in divers is essential to avoid panic, what training style works best? Does the Marine Corps approach, which scares the bejesus out of trainees, ultimately teach the beginner to take care of himself, or does it really fail to build confidence? Does the gentle, patient style build confidence or prevent the development of psychological strength?
- Are present-day instructors sufficiently trained to teach students about the pre-panic signs within themselves?
- What can a certified diver do to improve himself if he feels he has insufficient panic training?
- Should training not emphasize stress situations such as repeated free ascents, buddy breathing, rescue techniques, low visibility or night dives, etc.?

In conclusion, we believe that Dr. Kraft is focusing on the single most important cause of diver deaths. We believe each of the training organizations and most of their instructors are aware of the problems and are working to build confident divers. But it may be that the present methods are not adequate. What do you think? We invite comment.

QUESTIONNAIRE AVAILABLE

Dr. Kraft would like clubs, shops and individuals to complete his questionnaire on panic. Please write to him, specifying the number of copies, at 2423 Gramercy, Houston, Texas 77030. You need not have experienced panic to be of aid to this very important research.

The author of this study is Irvin A. Kraft, M.D., an associate professor of psychiatry and pediatrics at Baylor College of Medicine, clinical professor of mental health at the University of Texas School of Public Health, and medical director of the Texas Institute of Child Psychiatry. He has been a NAUI instructor since 1970. A version of this article was first printed in the Addendum of the Proceedings of NAUI's IQ8; the full IQ8 volume can be obtained from NAUI for $15 (P.O. Box 630, Colton, CA 92324). NAUI has granted reprint permission. Undercurrent assumes the responsibility for the editing and additional data and analysis supplied.

Correspondents located strategically in the major diving areas of the world as well as on all coasts and major inland waters of the continental United States.

The editors welcome comments, suggestions and manuscripts from the readers of *Undercurrent*.