

## The Great Barrier Reef, Australia

### —Two Trips For Two Pocketbooks

Located in the Coral Sea, Australia's Great Barrier Reef is 1250 miles long. Dive boats operate from any number of cities, usually crossing the 10 to 100 mile channel at night for the initial morning dive. Most American and Canadian divers sign up with American tour operators for trips there, and find quite a range of options: trips run from 7-17 days and cost from \$750 to \$3750. We thought it might be useful to contrast two trips, one short and less expensive with a longer and more expensive trip. Both trips were taken in November, 1983, by different reviewers. These are their reports.

— C.C., Travel Editor

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La Mer Diving Seafari (New York City) offers a 17-day trip (14-day voyage) for \$3750 plus air. That buys luxurious ground arrangements as well as the complete dive charter, with bar bills and tips extra. Ground arrangements are top-of-the-line. Upon deplaning in Sydney, our group was met by a chauffeured Rolls Royce, which took us to the newly opened Regent Hotel. Two days in Sydney allowed me to recover from jet lag, which I did in style thanks to our limousine and guide and a comprehensive tour of the sights and restaurants.

When I pay a substantial sum for a dive trip, I buy insurance. If something goes wrong, I expect it to be corrected, and that's what Amos Nachoum, the ebullient President of La Mer, claims he'll do. His true test came early when our plane northward from Sydney developed engine trouble and was forced to return. That meant we would miss our connecting flight to Rockhampton and lose a full day at sea. Amos, as disappointed as his paying customers, went right to work. After determining that none of us had pressing dates at home, he soon had the entire schedule moved one day ahead, with Quantas agreeing not to invoke penalties on the special airfares and, in fact, handling all rescheduling of connecting flights back home. Amos even notified our stateside friends and relatives.

When we finally arrived at Yeppoon, the berth of the Coralita, we were greeted by Captain Walley Muller and his wife Denise; by crew members Diane, Simeon and

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Alexander; and by official sea dog Mandy, the beagle. Muller, a robust and hearty fellow, has been sailing the Coral Sea for 30 years as a fisherman, diver, and charter operator, taking not only tourists, but filmmakers and scientists as well. His craft is a 79-foot, twin-screw diesel with a 20-foot beam. She sleeps twelve passengers in two double-bedded cabins (each with a head and shower) and four cabins with bunks (which share toilets and showers but have individual sinks). All cabins have adequate storage space and are air-conditioned, quite helpful in the 80<sup>o</sup>+ summer weather. Linens were changed daily (a washer and dryer are aboard). A desalinator ensures plentiful water and a cascade system ensures plenty of air.

Our voyage began with an overnight cruise through open ocean. We arrived at the Great Barrier Reef shortly after dawn--long after I took to my bunk, green to the gills and sick to the stomach. But this was the only occasion. Although during much of the time we were at sea unseasonal storms were in the vicinity, Muller was able to avoid them. His skill was evident when we were able to dive during one three-day stretch when another charter boat was forced to seek shelter to ride out the weather. Overall, the weather was adequate to excellent.

My thrills began on my very first dive, at Swain Reef on the southern section of the Great Barrier. Here I met with beautiful--and highly toxic--sea snakes. They are docile, even playful, and range in size to six feet. After my second dive, I swam so close to them that I bragged about my bravery. By the third dive, I and every other diver had handled these incredible creatures.

The Great Barrier is as rich in unique marine life as any place in the world. Among the coral pinnacles--"bommies"--are fish ranging from tiny blennies to giant Napoleon wrasses, lion fish and scorpion fish to the 150-pound Queensland grouper. Hard and soft corals are decorated with colonies of delicate anemonies (and the ubiquitous clownfish), chrinoids, and clams. Octopus and squid are seen occasionally. (But I saw few nudibranches and no Spanish dancers.) The fish in these seldom-visited waters are not tamed, pampered, hand-fed residents of an open water petting zoo. Some, like the sea snake, allow themselves to be handled. Others, like multi-colored harlequin wrasses or clown triggers, retreat fearfully into the reef.

Al Giddings used the Coralita as his base at Marion Reef when filming The Deep. That was our next stop: Near-perfect visibility (up to 300 feet!), an endless variety of geological features and walls covered with golden gorgonia. A perfect setting! In one cavern among its narrow canyons I saw several "sleeping" white tip sharks. And at Lihou Reef I learned to dive with sharks, plenty of sharks. As soon as we dropped anchor they arrived. I hesitated to enter the water, but our hostess Diane jumped right in. Rather than be put to shame, I followed. The sharks posed no threat. After a few dives my heartbeat slowed, my breathing returned to normal. I stopped taking hurried snapshots and started composing. After a few days, the company of whaler sharks became routine. Well...almost.

We moored at Diamond Island to visit the frigates, gannets, terns and turtles. Only nest-robbing gulls are enemies to the birds, so they showed little fear and allowed incredibly close encounters. Off, then, to the virgin waters of Abington Reef, where on the first dive I found the exotic angels, moorish idols and unicorns.

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Though I had boned up on my Australian fish, I still found several species I could not identify. Here the coral was cut through by chasms and passageways creating a series of isolated chambers. The sand bottom began at 50 feet, sloping to a wall where it dropped away.

For such a pricey trip, one must expect comparable cuisine. Indeed it was, thanks to Denise and Diane. Breakfasts included fresh fruits, cereals, eggs and meats. Lunches ranged from home-cooked soups and sandwiches to full-course meals. Fresh baked breads were available at every meal. Appetizers, which might include sashimi if Simeon had landed tuna, were offered at cocktail hour. Dinner (or "tea," as the Australians call it) rivaled the gourmet efforts of Sydney's restaurants. Beef Wellington, roast lamb, broiled steaks, fresh fish and other dishes served as main courses. Denise routinely prepared cakes, trifles, puddings and assorted confections, and fresh fruit and cheese were offered nightly. Wine is served with dinner. Beer, soft drinks and a limited selection of hard stuff (at an extra cost, but passengers are welcome to bring their own) are available. Night dives were possible every evening, unless we were to depart for the next day's location, or if weather forced us to seek shelter. Those who had over-indulged at dinner, chatted, watched video tapes, listened to stereo, or challenged Diane, usually unsuccessfully, to a round of Scrabble.

All diving was unsupervised, although one could choose to be led by Amos. The number of dives, the depth and the surface time was up to the individual. The beauty and clarity of the water continually tempted me to push the tables. Being at least a day from any chamber was a chilling thought. I played it cool.

After spending 14 days at sea, I would have a hard time touring this area in any shorter period. It takes that much time to see both northern and southern sections of the Great Barrier system and the open ocean reefs. Shorter tours feature only the Great Barrier, just touching the open ocean reefs, and stick to a much smaller area. For me, this is too long a journey not to sample the full variety of the region.

With any trip, there is always the risk of weather. Unseasonal winds prevented a planned visit to the highly touted Moore Reef, and weather also prevented a visit to the wreck of the Yongala, apparently a remarkable dive. We substituted two previously unexplored sites. The one at Tregossi Reef was disappointing, but the second at Mid-Reef provided an unexpected assortment of rare and unusual fish.

In writing a critical review, I know that I have a responsibility to the readers to dig up the dirt, to find the faults that can make one question such a high price tag. I feel I'm shirking my responsibility by finding none. Although not all divers will be able to part with the princely sums required for this special voyage, those who can, if my experience is any indication, will have the trip of a lifetime.

\* \* \* \* \*

Damn if I didn't want to dive the Barrier Reef, but those prices were out of my range. And two weeks was the most I could get away for. I called La Mer to

### THE CORALITA

Diving for Beginners	this is the big leagues
Diving for Experienced	★ ★ ★ ★ ★
Boat Accommodations	★ ★ ★ ★ ★
Boat Meals	★ ★ ★ ★ ★
Moneysworth	★ ★ ★ ★ ★

★ poor. ★★ fair. ★★★ average. ★★★★ good. ★★★★★ excellent

complain. Rather than getting defensive, however, they suggested a less expensive boat they represent, the Takaroa, which offered seven-day trips for \$850. Since my travel agent put together a \$1350 round trip fare from New York to Australia (four stopovers permitted, including Honolulu), I prepared for my November adventure, which took me to Melbourne, Sydney, and then up to Townsville, home port of the Takaroa. No one met me at the plane, no one took me on a tour of the cities, no one directed me to the boat. I was on my own. But that's what buses and taxis are for. I went to the Takaroa, met the captain, dropped off my gear and spent the day snorkeling and touring before the evening departure.

The 56-foot Takaroa is a former fishing boat, converted for diving by Captain Harry Johnson. While it could sleep eight, the bunks were close together and storage space limited. The cabins were air-conditioned, but only if the compressor was running. And I changed the sheets. The night run was rough, and by 6am I returned my dinner to the sea. But I was ready to make my first dive at Wheeler's Reef, 50 miles from Townsville. The bommies began at 20 feet, and the bottom was 60 to 100 feet down. Descending, I saw what looked like large plates: some green, others red, pink, orange, white, brown or blue--various species of staghorn coral (scientific name: Acropora). Each polyp or staghorn was less than 2 inches long, but thousands grew out of each other to form "plates" that ranged from 1 to 25 feet in diameter--and all attached to a stem of solid coral. Acropora constitutes 70% of all coral on the Barrier Reef. While sponges line the undersides, the large and brilliant cylindrical sponges of the Caribbean were not present.

Swimming under, around, above, and through these corals were hundreds of unique and colorful fish. The Harlequin tusk fish is striped in red, orange, yellow and black. Graceful moorish idols, adorned with a tassel-like appendage as long as 18 inches travel in twos and threes. Coral trout come in different hues of purple and blue, dotted with tiny light blue spots. The tiger trout had yellow, black and white stripes and spots. One of the more unique creatures is the Giant clam, which grows to five feet long and is embedded in coral. I had a grand time touching their brilliant purple mantles, adorned with small blue spots, and watching the clams close themselves. They were so filled with flesh that as the mantle drew in on one side it would ooze out the other.

My most exciting diving was on the Yongola a merchant and passenger ship which sank in 1911 and whose whereabouts remained unknown for many decades. Upon arrival

Robby threw bread on the water, which was consumed immediately by a dozen large, triangular barfish, with yellow pectoral fins and dark brown stripes on their body. Harry led the first dive. The sides of the wreck were covered with clams, sponges and coral. A couple of beautiful but venomous lionfish floated about, while a six-foot moray slithered around, completely out of its lair. Harry directed us to the bottom of the wreck, where in a six-foot space at least a hundred huge fish, many one hundred pounds or so, swam about. One immense cod must have been eight feet long and as much as 800 pounds. Incredible!

### TAKAROA

Diving for Beginners	still the big leagues
Diving for Experienced	★ ★ ★ ★ ½
Boat Accommodations	★ ★ ★
Boat Meals	★ ★ ★ ★ ½
Moneysworth	★ ★ ★ ★ ½

★ poor, ★★ fair, ★★★ average, ★★★★ good, ★★★★★ excellent

Our next dive was to the top of the wreck. I had some cut up coral trout, and two-foot-long travelays and plenty of smaller fish rushed up to eat from my hand. The timid batfish remained nearby. A curious turtle swam up, asking if I cared for a ride. I accepted. And other divers hopped aboard as well.

## CUTTING THE COSTS FOR DIVING DOWN UNDER

La Mer is one of several agencies operating trips to the Coral Sea. As our reviewers indicated, their experiences were quite positive. For a brochure you may write: La Mer Diving Safari, 823 U.N. Plaza, Suite 810, New York, NY 10017, or call 212/599-0886.

As our Takaroa reviewer learned, however, there are other ways to book these vessels. It seems that the boats set aside certain trips for certain tour operators. If the boats are not filled, then the remaining bunks are sold at reduced rates to Australians—or to anyone who makes arrangements. Had our reviewer called a couple of weeks ahead of his departure time, he could have gotten aboard the Takaroa for \$450 or \$400 less than he paid through La Mer. And a month later, one of his buddies did just that.

So, if you are willing to plan an Australia trip on relatively short notice and feel sufficiently adventurous to make your own reservations by telephone (at a buck a minute long distance charge) send a check half-way around the world, and arrive without anyone to hug you at the airport, then you may wish to try these numbers.

The Reef Travel Centre in Townsville, can handle your trip on the Takaroa or other vessels. You may direct dial if you have a push button telephone: 011 61 77 724-688 or -131.

In Cairns, you can try Barry May at 011 070 516-360 for trips on the Reef Explorer or the Auriga Bay (see Undercurrent August, 1979.)

Barrier Reef Cruises represents the Coralita. The number is 011 61 79 391-588.

And, if you really want to research Australia and read the ads about trips, then consider subscribing to Skindiving in Australia and the South Pacific. This four-color magazine is published six times a year and may be ordered by sending \$17 U.S. funds to: Oceans Enterprises, P.O. Box 4604, Spencer Street, Melbourne, Australia 3001.

Finally, one last tidbit. The exchange rate for the American dollar is about \$1.07 Australian.

On a night dive all of the coral polyps had blossomed, including yellow coral with red tentacles. An enormous barracuda hovered near by. I discovered a sleeping turtle. Then I sensed something above me, shined my light upwards, and saw an enormous black ray hovering so close I could clearly see his gill and mouth openings. For a moment I considered taking him for a ride--until I saw the spike on his tail. We dived here again in the morning and even though this is one of the most popular sites for dives out of Townsville, I did not see another boat during the 24 hours we were here.

Harry moved on to another reef which he had never dived. It was dead and ment research ship, and slipped over for conversation and drinks, meeting American scientists who were working for the Australian government.

The Takaroa gave us seven full days of diving. I had a marvelous time. An average dive here would be absolutely sensational in the Caribbean. But I had my disappointments. I had hoped to visit several exciting sites sites covered in Skin Diver's fine feature last May, (Cod Hole, Lizard Island, Marion Reef), but I failed to understand just how big this reef system is. They are so far apart they could never be covered in a week's diving. Although La Mer's Takaroa literature promise Cod Hole and Flinder's Reef on the seven-day tour, we never got close to them. I anticipated seeing several forms of marine life, but did not. I wanted to watch the nudibranches, especially the Spanish dancers. I wanted to play with a sea snake. I did neither. And sharks were very rare.

Once the trip was completed, I spent a couple of days in Townsville, chinning with local divers, shopping, and stuffing myself at the Mariner Restaurant, where they had an "all you can eat" policy for \$20--I could have sent them into bankruptcy on the oysters and prawns alone. I'm not one for tours, so the opportunity to hang out with the Aussies came as a fine conclusion to a grand two weeks. Indeed, it was a trip of a lifetime.

# Making Photos From Slides

## —How to Handle Your Own Home Processing

Have you ever promised someone you met on a diving trip that you would send them pictures? Then you return home, send your film off to be processed, look at the slides enthusiastically a week or two later, and make a mental note: "I must get some prints made for them."

Time goes by, the slides sit around, eventually getting put away. Somehow you never get around to taking the slides to your local photo store to have prints made. And your new friends are slowly forgotten.

Unfortunately for your friends, slide film is the most practical for underwater use, whether for amateur or professional photographers. Slides can be projected, converted to black-and-white prints for publication, or enlarged into lovely color prints for display. Slide film is available in many speeds and in various types, which is essential for shooting with ambient light or for special effects.

But your friends need prints, even snapshots. And the Polaroid Corporation, well aware of that little gap in the market place, has slipped in with the Polaprinter, a device which permits anyone with the ability to load a camera and turn a dial to convert slides to Polaroid prints in just a minute or two. The Polaprinter, which retails for as little as \$100, now has a competitor from Vivatar—the Vivatar Instant Slide Printer—which can be purchased for as low as \$80. Although both machines use exactly the same color and black-and-white Polaroid film, there are differences between the machines. We've tested both.

The Polaprinter has two easy-to-operate dials to control exposure and contrast, with the normal settings clearly marked. The Vivatar Instant Slide Printer does not have a contrast dial, but does permit the user to set different exposures. The Polaprinter contrast dial, we found, allowed for a significant difference between the quality of the prints produced by the two devices. It was especially important when converting color slides to black-and-white for reproduction.

Each device operates similarly and each is especially easy to use. The Polaroid film is inserted into a cartridge which is inserted into the printer. After one selects the slide he wishes to print, that slide is inserted into the printer, with adjustments in position permitted so that some cropping is possible. One then adjusts for exposure and (with the Polaprinter, adjusts for contrast), then pushes a button to make the print. The undeveloped print is pulled out, a timer

button pushed, and when the machine beeps the print is developed and ready to be peeled off. The Vivatar machine has a single timer, the Polaroid has three timers so that three prints can be developed consecutively. That may be helpful to people who are producing a number of prints under time pressure, but most people will not need to work so fast; those who do can just as easily use a watch to time development.



The Polaprinter: This print was converted from a slide by the Polaprinter

Using Polaroid's Polacolor Type 669 film, acceptable color prints can be made directly from the slides. The price is roughly \$1 per print. The quality can be improved if the slide is worked with.

Color filters may have to be used with certain slide films. To correct the colors on the Vivatar Printer, one must buy the filter gels (at approximately \$8/gel) and work with them to produce the desired effect. The gels need to be trimmed with scissors and dropped into the printer, which is a somewhat clumsy operation. If one wishes to change filters one must remove the film and, therefore, expose one frame. On the Polaprinter, the gel filter is slipped directly into the machine and can be removed between shots without ruining a film frame. Polaroid recommends and supplies a CC 10R (red) filter if Polacolor 2 film is used. Polaroid recommends Polacolor Type 669 film with a CC 20-40R (red) filter when the original slide is on Kodachrome or similar film. Vivatar recommends CC5-10R filters. If the results are too

green, a magenta filter should be used; if too blue-green, a red filter will correct; if too blue, a yellow filter should be used for color correction. Adjusting the contrast setting and filtration is a matter of personal preference and experimentation.

Sometimes several prints have to be made of the same slide before an acceptable print is obtained. The color balance problems with instant film are about the same as when underwater slides are sent off to a lab for processing. The colors seem not to ring true either to the photographer's memory of the scene or the original slide's rendition. Patience and experimentation with the Polaprinter can yield quite acceptable results. As with many underwater prints that are not done in a custom lab, the reds tend to be a little sallow and dirty-brown looking.

The Polaroid Positive/Negative black and white Type 665 film is handy for photographers who need a black and white slide conversion for publication in a newspaper, magazine, club bulletin or the like. The film yields an instant  $3\frac{1}{4}'' \times 4\frac{1}{4}''$  black and white print which must be coated with a protective film (provided at purchase) within 30 minutes of development. The print is great for the photographer who edits or contributes to a dive club's newsletter. Professional black and white conversions from slides can cost from about \$2.50 to \$5.00. The converted Polaroid print, which is adequate for offset reproduction, is convenient and costs about 50¢.

A  $3\frac{1}{4}'' \times 4\frac{1}{4}''$  black and white negative is also produced. If one wishes to use the negative, it must be washed and clarified. This is a messy business. A rubber-like substance washes off the film, and small pieces of paper and jelly-coated ends from the film developer must be pulled off. Ideally the black and white negatives should be washed in a Sodium Sulfate solution. *Popular Photography* proposed a better clearing formula of Potassium Alum (1 oz.) and Sodium Sulfate (3 oz.) mixed in 1 quart of water. The negatives are thus clarified and hardened (to prevent scratching) in the same step. In an emergency,

the negative can be washed in plain cold water. The negative can be used after it is dried and wiped clean of water spots, but care must be taken to prevent its being scratched.

Aside from the cumbersome procedure for the Vivatar filters, both machines are simple to use. Since both use the same film they are equally fast. From inserting the slide to producing the black and white print takes less than a minute; for color less than a minute and a half. If one has the printer stored on a shelf, he can most likely pull it out, plug it in, select a slide, get a print, and put the machine back on the shelf in less than five minutes. And that's precisely what one pays for with either machine—convenience and speed.

What one does pay depends upon one's ability to shop around. Although the Polaprinter is listed by Polaroid at an outrageous \$595, we can find it in local camera stores for around \$200; the Vivatar around \$100. To shop for bargains, pick up a copy of *Modern Photography* or *Popular Photography*, both monthly publications available at any newsstand. In the March *Modern Photography* we find that Executive Photo in New York City sells the Polaprinter for \$99. To order from Executive call 212/947-5290 if you live in New York, or 800/223-7323 otherwise, and have your credit card in hand. Honest Abe's advertises the Vivatar at \$79.95 and the Polaprinter at \$108. His number is 800/221-0828 for out-of-staters and 212/436-6262 for New Yorkers.

And now, the choice. To our eye, the quality of the Polaprinter print seems superior to the Vivatar print (thanks, in some part, to the ability to correct contrast). If one has professional chores to perform, then the Polaprinter should be the machine of choice. For the amateur in search of snapshots to send his vacation dive buddy, the Vivatar will most likely work just fine. But remember: the machines do not produce professional, laboratory-quality prints. But what they—especially the Polaprinter—produce will be adequate for most purposes.

## The Personal Diving Computer

—See How Impressive It Looks!

It's no secret that a lion's share of divers have trouble working the U.S. Navy Tables, and a goodly number of those simply can't compute bottom time for a second dive without the assistance of a buddy.

With that in mind, we welcome the introduction of the AM-1, the Personal Diving Computer, marketed by American Scubatronics. And, when we saw the \$29.95 mail order price tag, we thought our problems were solved.

The AM-1 is a small hand-held computer. According to the advertising it is programmed to tell the diver on the surface:

- ★ surface consumption rate,
- ★ how long tank pressure will last,
- ★ how deep you can dive,
- ★ how much air you need.

Frankly, the only reason I would buy such a device is if it could provide fool-proof answers to any bot-

tom time, surface interval, depth or decompression question I might have. I'm not interested in air consumption calculations. That number went out of style when submersible pressure gauges came in. But if it can compute my decompression tables, then I might be a customer.

However, it took a while to become a customer. When the diving computer was first announced in *Skin Diver* ads last summer, many people sent off their checks, got them back canceled, but got no product and complained to us. We called the company and learned that a supply was due in September, but it was not until October and November that back orders were filled. As I have come to expect in this industry, too many people shoot their wad on advertising far before their products are in reasonable supply—or even ready for the market.



The AM-1 Personal Diving Computer

When my dive computer arrived, I opened the box and was immediately impressed with what looked like a Texas Instruments special: 33 buttons, plenty of dual functions. I pulled the instructions from the vinyl cover and thought I had gone blind. They were set in two point type, which is barely readable. Anyone over forty will need a magnifying glass and anyone under forty will need very short arms.

The instructions first warn that the user must be familiar with the U.S. Navy tables—which means about 10% of the certified divers are immediately excluded—and then the reader is told that the instru-

ment is to be used as "a training aid"; it is not a "diving instrument." Furthermore, we are told there is a "preset range," but there is no indication of that range. Undaunted, I went to work and within a half hour or so I could perform most of the calculations with ease.

I found, however, that the program makes a few assumptions—e.g., that the diver is not interested in decompressing below 10 feet and there will be length surface intervals between dives—which affect the versatility of the calculator. Examples:

►For a single dive, decompression time cannot be computed. If one wishes to dive to sixty feet for 65 minutes, and punches that into the computer, *error* is registered.

►It will not provide decompression times for repetitive dives if the first decompression stop is below ten feet or longer than 18 minutes at ten feet. Now most sport divers aren't involved in any dives approaching these parameters, but I feel a bit disconcerted when *error* flashes across the screen.

►It does not provide the surface interval for a repetitive dive. You must enter the interval you select, the depth, then you get the time. You cannot program your repetitive dive depth and time and get the appropriate interval.

The dive computer works for certain basics, but the more complicated dives are beyond the range of \$29.95. Even at the price, and with those limitations, I can't fashion myself sitting on a dive boat pushing little buttons. Many of the keys have multiple functions and they must be pushed in the appropriate order. Since my memory is no longer a youthful steel trap, I'd be forced to take along a magnifying glass and the instructions—and then I doubt that I could decipher the two point type in a rolling sea.

But the buttons aren't too tough to work. Even with neoprene gloves, the unit was workable—as long as my touch remained as gentle as the touch first demonstrated on Faye Wray by King Kong.

And the unit seems sturdy. I inadvertently dropped it and it still performed. I purposely dripped fresh water between the keys and the calculations still came out. (Whether sea water would produce a catalytic action is a question I can't answer.)

My recommendation? Well, I doubt if I'll use it again. I would always find myself having to check it against the tables, so why bother. Furthermore, I don't even have it any longer. Shortly after finishing my testing, my house was burgled. The yegg passed by a lot of valuable stuff, but sure enough walked out with my personal dive computer. That's how impressive it looks!

--Ben Davison

*Undercurrent* correspondents are located 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*.



# The Diving Accident Victim

## —How DAN Saves Lives

Michael Epstein (not his real name) made a 90-foot dive in a mid-western quarry for 27 minutes. He did not carry a watch, but did have a Bottom Timer. Although he stopped at 10 feet, his Bottom Timer did not operate at a depth less than 15 feet, so he surfaced after what seemed like only a couple of minutes. Later a pain flared in his arm. He attributed it to the heavy equipment he had been carrying. He washed down a couple of aspirin with a beer or two and went to bed. By morning the pain still was persisting. Later that day he suspected bends. He asked a friend to drive him to a chamber owned by a construction company 100 miles away. When he arrived he learned the chamber physician was in Europe. With the pain increasing, he hurried to a local hospital. The attending physician knew about DAN, the Divers Alert Network in Durham, North Carolina. The doctor called DAN and was told to conduct certain neurological tests which would verify decompression sickness. DAN then directed the diver to another chamber, and called ahead to prepare for his arrival. It was a 250-mile drive, but only 150 miles from the diver's home. Had DAN been contacted initially, the treatment could have begun much sooner. Luckily, the unnecessary delay had no ultimate effect on this diver's cure.

Terry Berns was on his first tropical vacation and took a dive to 80 feet for 30 minutes. During ascent, he had a problem controlling his buoyancy, and when he surfaced he had severe chest pains and nearly passed out. His buddy, suspecting an embolism, rushed him to the chamber on the island where the attendant readied him for recompression. But the attendant had second thoughts. He called DAN for assistance. In just a few minutes, a hyperbaric medicine specialist was on the line, reviewing carefully the nature of the dive and the symptoms. The DAN physician advised against the recompression, suspecting that a collapsed lung had occurred. A local physician on the island rushed to the chamber where, with the assistance of a long needle and a chest tube, located the pneumothorax and relieved the problem. Had the chamber attendant not called DAN, there is a good chance that chamber treatment would have further injured or perhaps killed the diver.

Raphael Belotti, a working diver, spent 45 minutes at 52 feet in the cold waters of the Pacific Northwest. When he surfaced he felt weak and a strange tingling in his arms and legs; also, his mouth was dry. He reported the problem, and a local policeman contacted DAN after sending him by ambulance to a hospital emergency room. DAN contacted the atten-

ding physician and recommended 100% oxygen and a complete neurological examination. Belotti was then symptom-free. After two hours and another exam, Belotti was advised to remain in the hospital overnight. He declined, preferring to stay with a friend. Six hours later he could not urinate and felt a numbness in one of his legs. His friend contacted DAN again, and, with DAN's assistance, Belotti was evacuated by helicopter to a nearby chamber for treatment. He recovered. *(Continued on page 10)*

### DIVING ACCIDENTS: CIRCUMSTANCES & SYMPTOMS

Decompression sickness is of two types. Type I affects the musculoskeletal system. Its primary symptoms are limb or joint pain and may include itching, skin rashes, or localized swelling. Type II is much more serious—it affects the central neurological, cardiovascular, respiratory and gastrointestinal systems. The most common symptoms in DAN-recorded cases are weakness, numbness, tingling, and loss of sensation, particularly in the lower extremities.

Ninety-two cases of neurologic injury from underwater diving accidents referred to DAN during 1981 and 1982 were examined by Dr. Arthur Dick, Assistant Director of the Diving Accident Network in 1981 and '82, who found clinical symptoms of decompression sickness (DCS) occurred in 56 (61%), and 36 (39%) had symptoms of cerebral air embolism (AE). The average dive depth preceding DCS was 70 feet with 59% of the cases occurring between 30 and 120 feet. Embolism occurred nearer the surface, with 54% following dives to less than 60 feet. Neurologic symptoms of DCS included sensory and motor dysfunction of the extremities; 41% were asymmetric, 23% involved primarily upper extremities, and 46% involved sensory loss only. Air embolisms, which may follow dives as shallow as four feet, produced unconsciousness in 40% and seizures in 5%. Central nervous system symptoms were common: 22% had visual loss, 22% had headache, and 14% had speech deficits. About 60% of the 1983 DCS cases treated by DAN exhibited Type II symptoms.

## The Virgin Islands Law Suit

In 1982, Ted and Jane Dixon, a young couple from California, went to work at the Virgin Islands Diving School in St. Thomas. Seven months later they departed to join the staff of the St. Thomas Diving Club. VIDS owners Marv Allis and Sue Leveson sued, on the grounds that the contract they had with the Dixons prohibited them from working for any other diving operation on St. Thomas for two years after leaving VIDS. The case came to trial last summer.

VIDS attorney argued that Marv Allis's business had been damaged since he could no longer talk openly with his employees for fear that they would use the information if they went to work for a competitor. Furthermore, the Dixons had signed the contract prior to taking the job, and it did not prevent them from taking other kinds of employment. The attorney also raised the issue of a letter the Dixons had written to several training organizations criticizing the safety conditions and various procedures at VIDS. He argued that the owners had to take valuable time to answer these charges, which had "chilled" their relationship with the regulatory organizations.

The attorney for the Dixons argued that no other dive school on St. Thomas required a non-competition, nondisclosure contract. He claimed also that the plaintiffs failed to show that the Dixons had actually passed on "trade secrets" or special methods to their new employer. The Virgin Islands Diving School has as much as 70% of the cruise ship passenger diving business, the attorney said, so considering this near-monopoly position it did not need such exceptional measures to protect its business stature.

Under cross examination, the Dixons testified that they felt forced to lead several dives under what they considered unsafe conditions. Jane Dixon said she did not cancel any dives, but she did shorten several despite her feeling that she might be fired for doing so.

On October 19, 1983, the court declared that "the noncompetition and nondisclosure contract between the parties is void and unenforceable as against public policy on the ground that it is an unreasonable restraint on competition."

The court required the Dixons to pay their own attorney's fees.

In 1983, the Diver's Alert Network received 1600 phone calls from divers seeking help or advice. These cases are only three of them. As many as 200 cases of similar seriousness involved DAN last year—about half the number of chamber cases reported throughout the United States and the Caribbean.

Luckily, most calls aren't so serious. People ask, for example, whether they can dive if they're pregnant, how diabetes will affect their certification, or whether certain medications will affect their diving. But DAN's *raison d'être* is not to answer questions like these.

DAN is here to provide *emergency* consultation for any dive accident. Without DAN, scores of helped divers would not have survived, or would have been crippled for life. DAN is a blessing for all divers.

But whether it continues to be a blessing will depend upon diver support. Originally supported entirely by Federal grants, DAN is a victim of this Administration's preference for guns over butter. Now, as an awareness of DAN spreads throughout the diving community it has got to scramble for money.

DAN doesn't need a lot. In the first place, it is—and has been—almost entirely staffed by volunteers. In each of seven DAN regions, at least two volunteers keep tabs on which chambers are working and how to bring them into action. The volunteer physicians not only are able to provide ex-

pert consultation to the chamber operators on which specific recompression profile to institute for the accident victim, but also provide treatment advice prior to arrival at the chamber. They are able to organize air ambulances and other assistance as required. A call to DAN's number—collect calls are accepted in emergencies—brings this system into action immediately.

DAN's modest \$130,000 annual budget is directed mainly toward publicizing the services provided throughout the diving community and paying the support costs—i.e., telephone, promotion, printing and travel. Only two people are paid—Chris Wachholz, the Assistant Director, and his secretary.

To raise his annual budget, Wachholz has put together a sophisticated fund raising program, including dive club and dive store memberships, individual memberships for as little as \$10 and corporate memberships ranging from \$250 to \$10,000. Several dive stores, dive clubs and a few commercial enterprises have aided by sponsoring fund raising events or contributing profits from sales. For example, the Miami-based dive charter, the *Impossible Dream*, is giving DAN its proceeds from a 3½ day charter trip to the Bahamas in late April. DAN offers a brochure which instructs in the organization of an underwater treasure hunt, a great activity for groups

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which will provide DAN with income as well. But individual membership should be the backbone of DAN's support, and for a minimum \$10 contribution, that membership—and its services should one ever need them—is a bargain.

DAN currently monitors 200 chambers in the United States, Canada, and the Caribbean. Only 50 accept sport divers; the others are commercial, private and military, which may accept referrals if possible. Five Caribbean islands have fully operable chambers: Curacao, Cozumel, Grand Cayman, Jamaica and Puerto Rico. There is a sixth chamber at Guantanamo Bay, Cuba, but it is not easily accessible. A chamber on St. Croix is no longer available to sport divers, and a chamber in the Bahamas at UNEXCO at Freeport currently is limited to 60 feet. Miami, of course, also has a chamber.

Although many divers push the tables in clear, warm tropical waters, the problems associated with getting bent in the Caribbean are far more complicated than similar accidents in the United States or Canada. In the first place, the quality of medical care may vary from island to island. Furthermore, there are few, if any, physicians trained in hyperbaric medicine. For example, at *Undercurrent* we have received several letters detailing difficulties in handling bends cases on Cozumel. That's no place to get bent.

Second, communication between the U.S. and the Caribbean can be spotty. *Undercurrent* editor, Ben Davison, while in Negril, Jamaica last year, had to wait an average of 45 minutes to get a call through to the United States—if he could get through at all.

Third, evacuation from an island without a chamber to a chamber location requires a private airline or an air ambulance. For such a flight, which might cost as much as \$10,000, an air ambulance operator requires evidence that one's insurance will cover the cost (and most insurance does not) or it requires cash. Some bent divers have had to wait up to 48 hours to get to a suitable chamber.

Wachholz told us that to solve the problems of Caribbean injuries, DAN is working to increase com-

## DIVING ACCIDENT NETWORK

Diving Emergencies Only  
24 hours a day  
(919) 684-8111

For Information Only  
Monday-Friday, 9-5 est  
(919) 684-2948

munication among Caribbean chambers and DAN; to educate local health care workers and dive masters about DAN and teach them how to recognize diving related injuries; to develop low-cost air ambulance insurance for divers. "We are also seeking to assist local authorities to civilian chambers on St. Thomas and Puerto Rico," he said. "We need the cooperation of divers, dive resorts, and health-care workers in the Caribbean. The Caribbean chambers, for the most part, work very well under less than ideal circumstances: there are no hospital associations, often no physician in attendance, and it's usually a small, formerly commercial chamber staffed and maintained by volunteers. They do the best they can, and we will assist them as much as possible."

No doubt DAN plays an important role in sport diving safety. Many injured divers escaped permanent injury thanks to rapid attention by DAN volunteers on the DAN hot line.

But, DAN needs your support. To aid DAN, we have included its membership support coupon with this issue of your newsletter. Won't you take a moment and send your check to DAN.

No doubt you're a safe diver. And so are your friends and loved ones. Nonetheless, you can be comforted about DAN's very existence. Without your support—and the support of other sport divers—DAN could cease to exist. Your tax-deductible contribution of \$10, \$20, or even \$100 is the most inexpensive insurance you can buy.

Please give as much as you can.

## The Shark Stopper Stopped

The search for a "shark stopper" no doubt has as many potential entrepreneurs as the search for the fountain of youth. Perhaps the first commercial ripoff was back during World War II when the U.S. Navy included a small packet of sharp repellent on its life jackets. It was not until the 1970s that researchers determined the product was not only useless, but that it seemed to attract rather than repel sharks. Some

### —A Product Before Its Time

sharks even gained a fondness for eating the packets.

Other researchers have tried poisons. An Australian researcher injected 30 different poisons into sharks in the 1960s. Not one, including cyanide and strychnine, killed the sharks in less than 30 seconds—more than enough time to devour the injector.

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Killer whales are the only known predators of sharks, so researcher Arthur Myrberg from the Rosentiel School of Atmospheric and Ocean Sciences at the University of Miami tried to frighten the animals with tape recorded cries of killer whales. He was so enthusiastic about the possibilities, he told himself "this is where I get my Porsche." Testing his theory in the Bahamas in 1976, Myrberg discovered "the larger the shark the less they cared about the whale sounds." Sharks that were frightened away initially often returned to grab the bait on a second or third pass.

Apparently, he is still driving a Toyota.

Steve Rhodes, the most recent dreamer about making it big with a shark repellent, also failed to earn his Porsche. Last year the youthful Rhodes organized Ocean Research, a company with a single product—the *Shark Stopper*. Although a version of Rhodes product might very well be the one that eventually stops sharks, it won't be Rhodes who profits.

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*Sharks were stopped dead in the water by a whiff of the secretion of the Moses Sole.*

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In May, 1982, Dr. Samuel Gruber, a marine biologist at the Rosentiel School announced that his department had isolated a substance called paradaxin, which is toxic to sharks. His work stemmed from previous discoveries by Dr. Eugenie Clark, who found that the so-called Moses Sole, a Red Sea flatfish, produced a chemical capable of paralyzing advancing sharks. *National Geographic* has shown remarkable photographs of Clarke's experiments where sharks were stopped dead in the water by a whiff of the secretion of the Moses Sole.

Gruber took the research further when he and a co-worker found that the paradaxin in the Moses Sole excretion was similar in chemical structure to industrial surfacants or detergents. A test of some 15 detergents found that, indeed, strong shark-repelling qualities were present. In his 1982 announcement, Gruber said, however, that as many as five years would be required before the product is ready for the market.

In September, 1983, Dr. Gruber issued a second statement, announcing that new research had found that sodium dodecyl sulfate (SDS) was even more successful than paradaxin. SDS is a detergent used in shampoo and dish-washing liquids. Gruber indicated that it would now take as many as three years to complete his research.

Sometime during this period, Steve Rhodes produced eight-ounce bottles of a substance he called *Shark Stopper*. In the sales letter developed for *Shark Stopper*, Rhodes said "the active ingredient is the product of naval research as well as extensive univer-

sity research at the Rosentiel School of Marine and Atmospheric Science and the Institute of Life Sciences of the Hebrew University in Jerusalem, Israel... Researchers isolated the toxin paradaxin and using this as a model a synthetic alternative was developed. The resulting substance is four times as potent as paradaxin... A patent has been applied for its use as a shark repellent... Commercial application of *Shark Stopper* is targeted to diving, boating, and other water sport industries."

But just what ingredients formed the base of *Shark Stopper* or how it got to Ocean Research remains a question.

In late August, 1983, Wayne Williams, Director of the Institute for Survival Technology at Nova University's Oceanographic Center (Dania, Florida) happened into a local life raft equipment company, Inflatable Services, where he was handed Rhodes' sales pitch for evaluation. Knowing the history of the development of paradaxin, Williams was quite surprised. As an expert in ocean survival, he was concerned that the product would create a false sense of security that could lead to safety problems. He tried to contact Ocean Research, but to no avail. He then contacted the University of Miami, which was quick to respond.

They acknowledged that the chemical was not ready for the market place; in fact, it had only been tested on small Lemon sharks and no one could predict the response of larger, more aggressive species. Furthermore, the notion that Ocean Research has a "patent pending" was equally disconcerting. Dr. Gruber told *Undercurrent* that "if this product were patentable, the University would have applied long ago."

In the meantime, it seems, no one had been able to speak with Steve Rhodes or to have calls returned from Ocean Research. (*Undercurrent* could find no phone number for the company or for Rhodes.) So, University attorneys fired off a letter demanding that they "cease and desist in marketing the product." Eventually Dr. Wisby, Associate Dean of the Rosentiel School, tracked down Steve Rhodes' father. There was no patent pending, he was told. Furthermore, Steve Rhodes was but an enterprising student at Harvard University. (A marketing major, no doubt.)

As quickly as it appeared, *Shark Stopper* was stopped.

At the University of Miami the research continues. Recently the product has proven effective on Blue Sharks, but commercial availability is still three years away.

A few *Shark Stoppers* may be left on the market. If you happen to have a bottle, you have contributed to the tuition of Stephen Rhodes—if not, his Porsche. No doubt that young man has quite an entrepreneurial future ahead.