

undercurrent®

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THE PRIVATE, EXCLUSIVE GUIDE FOR SERIOUS DIVERS

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The Pacific Nomad, Fiji, South Pacific

-- Three If By Land, Five If By Sea

Dear Reader,

Very late one Saturday night in April after a cross-country flight I found myself in the Los Angeles airport scanning several hundred sleepy travelers bound for the South Pacific. My Qantas flight was already six hours late and most of us had had various combinations of flight delays, cross-country two-lunch afternoons or hours of near-starvation. Life had become primal. With the prospects of 14 more hours' flying time ahead, there wasn't a lot of playfulness apparent.

I was off to go diving where few had gone before, aboard the Fiji-based Pacific Nomad. According to the trip manifest prepared by See and Sea Travel, 16 paying customers were joining underwater photographer Howard Hall and his spunky wife Michele, who had become stand-in hosts for this adventure.

My journey to Fiji was broken up by three in-flight breakfasts and a stop in Tahiti, where we were required to deplane. As more than one passenger learned, if you forget your boarding pass when you deplane, you will be treated like an international fugitive by the Tahitian gendarmes. While airport sitting, I found it tough to get a cup of coffee, a postage stamp, or a word in English that didn't come with some Frankish sneer. The memories of discomforts and Tahitian effrontery quickly dissipated, however, when we began our descent to Nadi (pronounced "Nandi") on the island of Vitu Levu.

From far above, the few hundred islands and reefs below looked like Divers' Heaven and I started to shake off the scales I'd grown on the long flight. We were going diving! Down there. In all that beauty! Yeah!

The journey would not be over until it was over. The advertised one-hour bus ride to the Nomad was really three, so finally, sort of like Moses and the Promised Land, we arrived after what seemed like 40 years, late in the afternoon but early in the adventure, at our ship.

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Swaggering out of the foc's'le cabin came a cherubic Englishman who introduced himself as "Steve Steward, Jack of All Trades," serving in this incarnation as "Dive Operations Manager." His briefing was the first of many little talks and "rhapsodic dive plans" we were to hear from our witty and competent leader during the next 11 days.

I was assigned a miniscule cabin, one of three on the bridge deck. Even a fish-eye lens couldn't adequately expand these closets. My first inclination was to rebel, but I decided to give it a chance. As the days passed, the tiny cabin became more and more pleasant and I grew to like it. For those more fortunate to be quartered in the six cabins on the deck below, there was no period of adjustment. They are "just right."

The Pacific Nomad was a Japanese fishing vessel before Marine Pacific changed her into a first-rate ship for full-time diving. She is not, as advertised, 115 feet long, but really only 101 feet. She is, however, perfectly maintained, as one can see whether looking superficially at the clean decks and floors or more critically at the catwalks and machinery in the engine room. She has a ship-shape galley that handles five meals a day for 18 divers and 11 crew.

In charge of this well-tuned tonnage is a wonderful Fijian Captain named Kapi, who always had a smile and a good word. Capt. Kapi has sailed Marine Pacific's bigger ships for three decades in the South Pacific, so for him running the Pacific Nomad is a breeze. Indeed, the entire crew makes it clear from the beginning that they are there for one reason: to facilitate your diving experience. They communicate a genuine pleasure in having guests aboard and made me feel better and better as the days passed.

The only non-Fijians are English: Steve and his wonderfully cheeky wife, Pauline. Steve gives an entertaining dive plan before each departure in the "rubber duckies" (aka Zodiacs) that builds on itself day by day until we all began to giggle in anticipation. But don't be misled by the fun: this is a serious and carefully planned operation run with pride. Example: On our second night out someone forgot to light the market buoy for our night dive. We searched for our site for some time and only quit when we mutinied and made the Duckie return to the ship. Steve took the error seriously enough to call a crew meeting. That was the first and last of our problems with diving, and I'm talking about some 40 dives in all kinds of places. Good show, what?

Underwater, there was always the sense that while everyone was accounted for, we were all thought to be grown-ups who could take care of ourselves. One could, however, tell when Steve was not happy with the odd, inappropriate maneuver by one of us, because he would take off swimming like an aquatic Bat(ray) Man. We're talking about one strong swimmer, here.

The only obstacle to my full endorsement of the splendor of the diving was that I had to rid myself of some over-rich expectations. I think See & Sea Travel's enthusiastic advertising may get in its own way. Owner Carl Roessler calls this "World Class Diving." Makes me feel like an Olympian when I hear him

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talk about it. Diving elevated into the Mystic. He's got the most seductive brochures in the dive travel business to entice guests aboard the first-rate live-aboard ships he represents. Now I know that to sell travel, even great travel, one has to make the customer feel like buying. But somehow the message seems to create the assumption that it is you, the diver, who is the superlative player in the diving drama. The truth is that it is the diving environment and its wondrous life forms that are the superlative forces. As soon as I shed the Olympian hype, I myself into to astounding reality into which I descended.

An example of my minor gripe leaps to mind. In "The Brochure," you are told that "This vessel offers you the finest diving in the Fiji Islands -- Beqa, Wakaya, The Lau Group and Great Astrolabe Reef . . ." On board, I learned that the Nomad does not visit either The Lau Group in the remote eastern fringes of the Fijis, nor does she dive Great Astrolabe Reef far to the south of Viti Levu. The two main obstacles to diving these areas are the jealously guarded fishing rights of the Fijians who live there, and, in the case of The Lau Group, the economics and logistics of the lengthy crossing. I would have liked to know this ahead of time. And I would have gone anyway.

We spent most of our nine-and-a-half dive days near the island of Wakaya and its nearest neighbor, Makongai, about nine hours northeast of Suva. We started out, however, steaming just south of our embarkation point to anchor for two-and-a-half days in the region of Mbenga (the "Coral Coast"), where Fijian Fire Walkers still practice their amazing rituals. We did our first dives in the environs of Yanuka Island. Just in case anyone needed spiritual inspiration, the dive sites carry uplifting names like the "Three Nuns," "The Bishop," and "The Seven Sisters," near the "Two Monks."

These were our get-acquainted dives, but they also provided wondrous opportunities to photograph huge coral heads comprising many species of soft corals, and multitudes of bright sea fans. While the close-up kit specialists were establishing their territorial rights among the coral heads, Steve took several of us on a quick swim away from the madding crowd to the "Two Monks." As we descended to 70 feet in the coral gardens, we saw an enormous bump-headed wrasse. It had to go a few hundred pounds. Nearby were five or six smaller grouper, and circling the whole menagerie were two white-tip sharks. I was excited, but we stopped and quieted down to watch. A few moments later a much larger shark came at the whole scene from the east and trucking. Tension became palpable. Fish scattered everywhere. It was a grey whaler and it, too, seemed in a lurchy sort of mood. Right there I got over my "Olympian Dissonance" and got where I was. Even the screens on my computers seemed to brighten up. The whaler came right at us and veered off suddenly upward, into a large school of shining barracuda. Yow! This was great!

Here's where I decided to become a "Large Animal Encounter Specialist" for the rest of the trip and put away my camera. While the camera hounds went for

Fiji. It's Not That Far Away

In neither time nor money is Fiji that far away. Especially for West Coast divers, for whom it may not take much time or much more cash to fly to Fiji than it does to Bonaire.

Once you get aboard a flight in the Los Angeles airport, you'll be in Fiji in between 12½ and 14 hours depending upon where the plane stops. For West Coast divers flying to certain Caribbean destinations, they must overnight in Florida or New York or take a red eye flight.

From Los Angeles, the air fare to Fiji begins at \$850; from New York it is \$1123. Qantas, Air New Zealand and Air Canada (from Canada and Hawaii) make the trip.

The best diving season is April through October.

teeny green polyps and gorgeous emperor angel fish, I went for thrills.

Even though we all earned places on what Howard Hall aptly named the "Nada Patrol" on the occasional uninspiring dive near Wakaya and Makongai, there is an abundance and variety of terrain and creatures with deep and shallow dive choices. Outer walls to hundreds of fathoms or the tops and inner gardens that tended to bottom out at less than 90 feet. There were almost always large pelagics on the deep dives and all the tropicals your film could hold inside the reefs. Four dives were scheduled each day, but more or less were up to the individual. I kept to the schedule because it fit the right profiles on my computers. Of course, everyone was computer diving and I urge you not to even consider leaving home without one (or two).

You like clown fish? I saw enough to populate Paris. Want to see the pictures right away? E6 Processing is readily available and reasonably priced. Want to dive between the scheduled departures? Just ask. The compressor fills 14 tanks an hour and there's always an extra one. Night dives? Always. You get to hang out with lobsters, stone fish, crabs, reef sharks, puffers, porcupine fish, green sea turtles, and schools of surgeon fish flowing like streams into the depths from above. Lionfish are common. I saw enough sleeping parrot fish to satisfy me for ten lifetimes. How about coral shrimp? Or flashlight fish? Everybody is out at night to entertain and enlighten you.

But, for me, it was the big creatures that brought the thrills. At Vatu Vula and Howard's Mountain at the entrance to the Makongain Channel, nearly every dive began with shark encounters. There were always white-tips, or black whalers, or bronze whalers checking me out. On one dive there was a large hammerhead swimming right for me. As usual, either my bubbles or my brawn seemed to scare him off. I would often drop in on top of a school of very wild-looking barracuda. Not your snaggle-toothed Caribbean beggars, but pristine fighter pilot-type 'cudas with whom I swam in rhythm.

On one dive we were approached by two large Mantas. For 15 minutes they played with us. Let's fly loops. O.K. How 'bout, "can you do wingovers?" I think so. Good. Let's do them together. Now, let's dive to about 130 and practice a few rolls! This is diving. No, this is living. At its finest!

Now fine living requires fine dining, and although the cuisine would not qualify as fine, it was consistently good. Always salads at both lunch and dinner. Excellent New Zealand lamb, including several lamb curry dishes. Samplings of starchy local cuisine, including fried or baked taro. And ice cream for dessert every night.

Before signing off, I must report another event that summarizes my joy in being free to dive the outer walls so often. I was cruising along at 70 feet when I saw something 40 feet below lying on a ledge. It looked like an enormous tadpole from that far above. With no maniacal camera jockeys nearby to spoil my fun, I descended slowly to check it out. This thing is huge! About 12 feet long. It's breathing. Look at that tail. Whoops. Somehow, Howard Hall showed up. You know how some football players are "always around the ball"? Well, Howard is like that about images. We just watch. This is, I find out later, a Zebra Shark. It is wondrous! It just sits there. Uh-oh. Some of the others have been watching Howard. Here they all come. This shark is about to be irradiated by strobes. It can't be long for our eyes. A few inconsiderate shoves later, the Zebra decides to split, but even then, as it rises slowly from the bottom and swishes its fuselage into dynamic motion to split from our "photo opportunity," it thrills me. I follow it out into the deep blue until it shakes

me off, too, and disappears into the darkness. I wish everyone on this water planet could have one magical chance meeting with this great creature; it makes something important a whole lot better.

I could, of course, go on and on. I could tell you about kava (the national intoxicant), cannibalism (a 4,000-year practice among Native Fijians discontinued only a little over a hundred years ago, with the consuming of the late Reverend Baker) and coups d'etat (of which the Fijians have experienced two, of the bloodless variety, since 1987). But I've said enough. Shipboard living, the experience of getting to know people in this special way and the constant marvel of life on the reefs of our waterplanet all come together on the Pacific Nomad in the best way possible. You will, as I have, return home with new friends and special things to think about for the rest of your life. I hope you have as fine a time as I did.

Divers Compass: Although the Nomad carries enough water for all the showers you want, the shower on the bridge deck doesn't work when the ones below are in use; just go below for your interdive showers. . . . Plan a few days at the end of your dive trip to hang out on land; the Fijian hotel is more native in design, the Regent is more staid and pacific, the Sheraton is beautiful and very American. . . . Don't buy anything in the waterfront markets in Suva when you land, if you're staying a few days elsewhere; the prices and quality all get better when you shop around.

Na Koro Resort, Vanua Levu, Fiji

Warm, floral-scented breezes, beautiful mountains silhouetted against the rising sun, slow pace . . . exciting diving. My destination would be Fiji's newly-built Na Koro Resort, on the island of Vanua Levu, a one-hour plane ride from Nadi aboard a twin-engine 8-seater Britain-Norman Islander. My only concern was that I would be arriving in February, the rainy season. The cyclone season.

A van from Na Koro met my buddy and me at the gravel air strip. We traveled for half an hour along a hot, dusty road over the mountain ridge to Savusavu Bay. Here, you cannot be in a hurry. No one else is. For one thing, the heat and humidity slow you down. For another, there is just no hurry available. The weary and impatient traveler is advised to take deep, soothing breaths as the van stops so the driver can chat with friends or run errands on the way to the hotel. You will get there, all in good time.

The resort consists of a main open-air building for dining and music, and about 20 "bures" -- individual thatched huts arranged for privacy of the guests -- as well as a salt-water swimming pool, tennis courts, sailboards and sailboats. This lovely complex rests in the midst of a coconut plantation, framed on one side by a towering, cloud-shrouded, fern-and-coconut-covered

Booking Fiji

These firms can provide booking service for one or more Fiji locations:

Adventure Express Travel, 185 Berry St., #503, San Francisco, CA 94107 (800/443-0799, 915/442-0799).

Aqua-Trek, 1980 Mountain Blvd., Oakland, CA 94611 (415/330-2550).

Sea Safaris, 3770 Highland Ave., #102, Manhattan Beach, CA 90266 (In California: 800/262-6670; 800/221-6670).

See and Sea Travel, 50 Francisco St., #205, San Francisco, CA 94133 (800 div-xprt; 415/434-3400).

Tropical Adventures, 170 Denny Way, Seattle, WA 98109 (206/441-3483; 800/247-3433).

mountain and on the other by the clear blue waters of the bay. While checking in, I asked about diving. The dive manager, I was told, would get in touch with us. I walked down to the water's edge to feel the warm water. I couldn't wait to get wet!

Diving is arranged through an on-site dive shop, operated by H2O Sports of Australia. Since May, 1988, they say, they have spent more than \$100,000 on a new dive facility and gear including a new 42-foot 25-person dive boat. In addition to reliable equipment (which they had), the visiting diver hopes for a knowledgeable and friendly guide. Unfortunately, I found the manager of diving, Tony Greene, a surly, "customer-is-always-wrong" kind of fellow who made himself unavailable the first few days and later in the week, would you believe, uncooperative about arranging diving. I finally located his assistant, Chris, a young Swede, who was friendly and seemed eager to take us diving. As it turned out, he was more eager to take care of personal errands, meet with friends, and go fishing . . . and promise to dive "tomorrow." Consequently, the night dive he promised never happened, and two day dives were cancelled because he was nowhere to be found -- even after making specific plans.

Another dive master, however, a Fijian named Rokko, was absolutely terrific. When it was possible to go with Rokko, we did, and found him to be friendly, helpful, and eager to go diving. Diving is from a 40-foot cruiser, with Captain Pele at the helm -- very friendly, and very competent in these reef-laden waters. Although most of the island is ringed by coral reef, the two to six divers daily were taken only to nearby dive spots (an economic decision, I surmise). Within Savusavu Bay, coral heads are abundant (one is almost within swimming distance of the hotel). I made four dives just outside the bay (about a 30-minute ride) and four more inside the bay.

Names for dive sites sometimes refer to the wildlife in evidence (Shark Alley, where we saw one lonely white tip shark), sometimes to the geography of the area (Split Rock is a coral head rising from the sandy bottom at 25 feet to within inches of the surface, containing a horizontal split near the bottom, forming a gorgonia-filled tunnel), and are sometimes difficult to make sense of (Fingers, Mystery Reef, Nugget, all of which contain interesting coral and sponge formations and are home to large populations of reef fish).

All of these places made for fantastic diving, a special delight because water temperatures made a wetsuit unnecessary: 87°F on the surface, down to 83°F at 90 feet, and in some caves the water was a nearly unpleasant 92 degrees. (A lycra suit is essential for protection from stinging coral and ubiquitous tiny jellyfish, too small and too numerous to avoid.)

Visibility ranged to 50 feet -- primarily because of the presence of lots of plankton -- but it was ample, nonetheless, to reveal the abundance of colorful life. The coral, both hard and soft, both inside and outside the bay, was plentiful, varied, and healthy in fantastic arrays of color. Colorful, shapely sponges grow in healthy numbers, as well. Although we never saw pelagics, small fish were plentiful. And I took special interest in tiny grass eels that live in the sandy bottom of the bay at about 60 feet. Many dozens of them stand like blades of grass, about five inches of their pale green bodies sticking out of their sandy holes, taking in plankton. To photograph them, I learned to approach slowly, crawling along the bottom. I could get within ten feet before they would instantly disappear into their holes -- then reappear cautiously, within a minute or so, when safety seemed assured.

I often look ahead to meals with the same vigor as I look ahead to diving,

but the meals here did not stack up. Breakfasts were either Continental or a fixed choice such as eggs, fried (sort of), and lunches ran to fish and chips or sandwiches. Dinners offered choices, usually, between chicken or beef, or beef or chicken or, occasionally, chicken or seafood. Toward the end of the week, guests tended to make tasteless jokes about the food and its repetitiveness. Coffee was nonexistent; instead, "kava" was served, but in this case it was not the Fijian ceremonial intoxicant, but a beverage tasting remarkably like Postum.

So without food to talk about, let's get back to the diving. Although I never depend on a dive master for my safety, I am confident that Rokko was vigilant and responsible. If needed, I think he would have been a help. I cannot say the same for Chris, however. Although he appears to be in his mid-twenties, he acts much younger. Underwater, he was often out of sight, and almost never at a safe distance from me or other divers. He clearly lacked maturity and judgment. The following is an example:

Because wind and currents pick up by midday in Savusavu, it is best to dive in the morning. On one day, however, five newcomers wanted to learn to dive, so Chris spent the morning in the pool giving these folks their first lesson. Even though the forecast predicted inclement weather, Chris insisted that our diving would wait until the afternoon. After lunch, storm clouds threatened, but Chris assured us the weather would hold. Captain Pele didn't seem so sure, but . . . with eight divers waiting, and Chris arrogantly insisting . . . we headed to open sea. The rain began as we rode the dinghy to the dive boat anchorage. By the time we were underway, the wind began to pick up, as a squall approached. As the boat pitched wildly in the heaving seas, everyone was drenched by either rain or ocean spray and many suffered the ill effects of diesel fumes. Visibility above the surface had been reduced in rain to about an eighth of a mile, and the darkened sky meant poor visibility below the surface. Still we pressed on. The faces of the would-be divers reflected deep concern about their decision to learn to dive. What an awful introduction to the pleasure of diving!

The increasing size of the swells now gave Captain Pele no choice. He confronted Chris' stubbornness and turned the boat around. We finally arrived safely, and while the others waited for the dinghy to take them ashore, I jumped in and swam the hundred yards, glad to be in the warmth of the water and pleased to be free from the hour of drenching, pitching and tossing.

Unfortunately, I had to depart and this was my last attempt to dive at Na Koro. It's a lovely hotel, but the dive operation was rife with personnel problems. Perhaps they are now resolved; nonetheless, in reading my colleague's report of diving from the Pacific Nomad one can easily see the limitations and risks of traveling to remote destinations and selecting a land-based operation. For the hard-core diver, with such superb diving at hand, those limitations and risks would be too

Na Koro:

Diving Quality	★ ★ ★ ★
Diving Services	★
Accommodations	★ ★ ★ ★ ★
Food	★ ★ ★
Moneysworth	★ ★ ★

* poor, ** fair, *** average, **** good, ***** excellent



Pacific Nomad:

Diving Quality	★ ★ ★ ★ ★
Accommodations	★ ★ ★
Food	★ ★ ★ ½
Boat Overall	★ ★ ★ ★ ★
Moneysworth	★ ★ ★ ★ ★

* poor, ** fair, *** average, **** good, ***** excellent

much to bear. For someone wanting more of a laid-back, resort-style cultural experience, those risks go with the turf. In my judgment, the diving, when considering the obstacles posed by the staff, is three stars by land, five if by sea.

Divers' Compass: Na Koro runs a little under \$1000 per person for a week's accommodations, two meals a day, and ten dives. . . . If you're headed to Fiji, you might wish to pick up a copy of Rob Kay's Fiji: Travel Survival Kit (Lonely Planet Publications, Berkeley, CA 1986) from your local bookstore.

Readers' Comments:

For divers unimpressed with our review of Na Koro, there are options. Qamea Beach Club, according to readers who have been there recently, is well liked and the diving services have improved over previous reports. A typical comment comes from Debbie Underwood (Milwaukee, OR): "Some of the best diving I have experienced. I give an A+ to Bob, our dive master. The pre-dive instructions, equipment, and photo experience were excellent. The dive groups were never more than 6 people. Night diving is a must. Overall, the food, service, and accommodations were excellent." . . . Dive Taveuni has super diving, but because there can be strong currents this is no place for new divers. Elise and Bob Kremer (Marlborough, CT) were there last year in May: "Although we were traveling in the 'good' season, we had almost constant rains. We were told this was atypical, and assume we just had bad luck. Dive guides generally high quality. Unpretentious, family-style resort, friendly staff, good and simple meals. High marks overall." A few readers complain about boring breakfasts and ramen-only lunches, and now and then our readers get on owner Ric Cammack for his arrogance, but most people come away pleased. . . . Carol Johnson (Anchorage) left the Alaskan winter to visit Waya Island in April: "Beautiful coral, but few big fish, as the villagers net them and several villagers, including the dive guide, spear fish with tanks, while diving with the guests (me). The bures are spartan and furnished with old, used furniture (Salvation Army-type) -- a bed or two, an old couch or two, with a cheap linoleum floor. There is a communal open-air shower and toilet and hot water -- if you let someone know in advance. Plenty of food, plainly cooked. One day the dive guide/boat operator forgot his mask (I had a spare one), the next day, his wet suit. One day he had a headache, so I dove with a local guy about 70, who put his BC on his tanks upside-down, then disappeared over the side with his reed spear." . . . Matagi Island, all 240 acres of it, says Bill Sandison (Hacienda Heights, CA), "is a diver's paradise. There are only 6 bures on the island and the owners will encourage you to plan your own diving and recreational day and accommodate you in every way. Exceptional diving; many soft corals, caves, beautiful walls." . . . If you're a longtime reader of Undercurrent, you may remember a lovely little place we visited years ago in the San Blas Islands off Panama. Unfortunately, Moody's Pidertupo Village was raided by drug-crazed Indians, the Moodys attacked and driven from the island. Now they're operating Moody's Namena (Moody's Namena, Private Mailbag, Suva, Fiji) in Fiji and though we have not received a first-hand report of their operation, we certainly liked the quality of their operation in the Caribbean.

Our readers tell us that the Mollie Dean is every bit as good as the Pacific Nomad. Says Judy Ovard (Dallas), "As good as a liveboard can be -- 72 feet, 8 cabins with private heads. Our group wanted minimum currents and maximum bottom time and that's what we got. Great Astrolabe is truly pristine diving. Boat was clean -- sheets and towels changed every three days -- and food wonderful. When requested more fish be added to the menu the cook outdid himself with variety. Sharks most dives. A 12-foot manta; a 10-foot+ leopard shark. Variety was amazing."

Sudden, Unexplained Death In Scuba Divers

-- Why the 35+ Year Old Male Is At Risk

In 1979, L. Eldridge reported on a series of sudden deaths in scuba divers, all of whom were males of 35-55 who had been diving in cold water. In her analysis of the problem, Eldridge proposed that a cardiovascular mechanism was at work in the deaths. Discussing the cardiovascular stresses peculiar to scuba diving, she highlighted cold water, the age of the divers and possible previous cardiac problems as significant among the variables contributing to the deaths.

Normally, there were no perceived symptoms to alert others of an impending problem or sudden death. The victims had been perceived by their diving partners as being "calm" or perhaps "tired" but sank suddenly beneath the surface and subsequently perished.

Sudden Death, Exercise and the Heart

Sudden cardiac deaths occur in individuals who are engaged in physical exercise. In an analysis of 30 deaths occurring to squash players in the United Kingdom, R.J. Northcote, *et al.*, found that 29 were males, with a mean age of 46. In all but one case, death was almost instantaneous. On the other hand, the overall ratio of cardiovascular problems to exercise is favorable. I. Vuori, for example, reported one cardiac fatality in every 600,000 long distance cross-country skiing participant hours, around four times the rate for a comparable resting population.

In the analysis of squash player death, an overwhelming majority of the victims had preexisting coronary heart disease; 22 of the 30 had reported prodromal symptoms such as chest pain, excessive breathlessness, dizziness or palpitations or indigestion and heartburn. Of these, only four had sought medical advice about the symptoms. As Northcote and his colleagues observed, "A high proportion of subjects, despite having prodromal symptoms or discomfort, played squash and ignored these factors."

Eldridge analyzed the accident records maintained by NAUI to determine what role cardiac problems might have play in accidents. She found that the majority of fatalities happened to divers older than 35 (even though most divers are younger) with a significantly higher incidence in cold water. Almost all the cardiac-related deaths revealed at least 40% to 60% occlusion of coronary arteries upon autopsy.

Eldridge's data, when coupled with the other studies, show an alarming fact. Many, if not most, of the victims had demonstrable cardiovascular problems. If they were aware of them, they apparently chose to ignore them.

The Denial of Risk

The denial of potential problems is not unusual. While there is controversy about "Type A" behavior in which individuals (mostly males) display aggressive, impatient and "macho" behavior, there is a reality about certain persons who exhibit such behavior. The diver who says that he can dive deeper, consume less air and stay longer than others is competing with others instead of developing his own skills and enjoyment.

G.L. Engle relates macho behavior to a loss of consciousness (vasovagal syncope) or passing out that occurs when strong emotional stress occurs. A.C. Guyton refers to this as "emotional fainting" and describes what occurs: the muscle vasodilator system is powerfully activated, markedly increasing blood flow through the muscles. Intense stimulation of the vagus nerve also occurs, slowing the heart rate significantly. This results in an instant drop in arterial pressure, which reduces blood flow to the brain and causes the individual to lose consciousness.

Engle observes that such fainting occurs in our machismo culture more commonly among men than women, "especially in settings in which the man feels the ambience to be one of strong social disapproval of any display of weakness. . . . the need to exaggerate bravery, strength, aggressiveness, and other culturally defined attributes of manliness and to deny, minimize, or at least not to acknowledge fear, coupled with shame for failure to live up to such standards, constitute the classic psychological preconditions for [vasovagal] syncope."

Physical exertion, itself, does not drastically affect a healthy heart. In the majority of cases seen in various studies, some previous history of a cardiovascular problem was demonstrated or inferred. In fact, most authorities agree that regular exercise can contribute to a fit cardiovascular system (but the risk is great when a sedentary person suddenly engages in strenuous physical activity).

It may well be, then, that a significant risk factor leading to the possibility of sudden cardiac death in a diver is the unwillingness or inability of the individual to recognize warning signs, a mechanism of denial possibly related to a "macho" type of behavior.

Psychological or emotional stress can also exert marked physiological change. Indeed, the emotional fainting of which Engle wrote can also be associated with neural reflexes which can lead to cardiac arrhythmias, eventually causing ventricular fibrillation (unregulated quivering or arrhythmias), the ultimate event in sudden cardiac death.

The Stresses of Diving

Cold. Cold water is the most severe stressor in diving. Of the many cardiovascular responses elicited by cold water, a primary one is the *diving reflex*, a response that evokes a slowing of the heart (called *bradycardia*) as well as a marked peripheral constriction of the blood vessels (vasoconstriction) in muscle and skin. The slowing of the heart compensates for this constriction and maintains blood pressure. The constriction allows for shunting of blood and oxygen to the heart, lung and brain. The diving reflex, with its potential for conserving oxygen and the cooling effect on the brain by cold water are the major factors in survival of victims of cold water near-drowning who remained submerged for periods of up to an hour and were revived.

The diving reflex normally begins when the face is immersed in water and the sensory endings of the trigeminal nerve, which branches along the sides of the face, are activated. Immersion of the face in water can elicit a slow down in the heart. But the combination of face immersion and breath-holding produces the greatest effect. Cold water also increases the degree of bradycardia or slowdown.

Eldridge has observed that the degree of heart slow down is highly variable; environmental influences or anxiety may block or intensify the response. Cold water produces arrhythmias that, in a fit person, may be normally restored to balance. In the person susceptible to cardiovascular problems, the arrhythmias may not be restored to balance and ventricular fibrillation and death may result.

Fatigue. Diving is strenuous. The underwater en-

At Last! A Book To Teach Photographic Techniques

I've been shooting photos underwater for 15 years and I'm still an amateur. I've never tried to sell a photo and never exhibited one. Still, I'm proud of those "professional" shots I do get. I must admit that sometimes the outcome is just plain luck.

When I look at the photographs of the real professionals such as Chris Newbert I marvel at how they find beautiful images when I might not have even taken a shot. The perfect lighting . . . the framing . . . the angle . . .

That's why I'm an amateur photographer and the professional is an artist.

The only way to learn photography is to take pictures, but I supplement my learning by reading what I can. In our February issue I decried the lack of a first-class book on how to take good underwater pictures. Then, one landed on my desk: Charles Seaborn's *Underwater Photography*, replete with 149 beautiful color plates. There is hardly an amateur underwater photographer who will not benefit by it.

I value this 144-page book for a single reason. Seaborn has provided a descriptive paragraph about the composition and technique of each of his photographs. For example, there are a million photos of schools of striped grunts, but Seaborn offers an unusually interesting image and writes:

"Having seen the blue strip grunts in the same place on a reef in Roatan several days in a row, I was able to size them up and go back with the right system. I decided to stack them vertically in the branches of the soft coral and let it frame them. Shooting from a camera to subject distance of three feet, I used Nikonos V, a 35 mm lens, a

Nikon SB 1202 Speedlight aimed almost directly at the grunts, and Kodachrome 64. The exposure was f/11 at 1/90 sec."

From these sorts of comments, one can learn well.

Seaborn's eight chapters have some obligatory information on environmental factors, planning and equipment, while his sections about lighting, closeup and wideangle photography and composition are especially helpful. But most of all, the value comes with the study of each of his shots:

"When I came across this elephant ear sponge in the Philippines, I wanted the sponge to stand out against the reef wall. I also wanted the numerous white sea cucumbers to be visible. Because the cucumbers provided an eerie look, I decided to enhance it by letting the surroundings go dark. To accomplish this, I aimed my Oceanic 2001 flash directly at the sponge from a short distance; this reduced the beam angle. And, by shooting from a camera-to-subject distance of two feet using a 15 mm wide angle lens, I was able to show the reasonably small cucumbers. With my Nikonos III, exposed at f/11 for 1/60 sec. on Kodachrome 64."

Underwater Photography is published by AM-PHOTO (Watson Guptill Publications), 1515 Broadway, New York, NY 10036, and can be found in many photography stores or ordered through your book dealer. The publisher of *Undercurrent* is making it available by mail order for \$22.45, which includes postage and handling: Atcom, 2315 Broadway, New York, NY 10024 (1/800-521-7004; 212/873-5900).

Ben Davison, editor

vironment itself, with its weightlessness, current and lowered visibility, is taxing on a diver, as is the equipment which creates drag and requires energy expenditure. In fact, even preparing to dive can be taxing. In midsummer, divers donning a 45-pound tank, 10-20 pounds of lead, and wearing a ¼-inch wet suit have been found to have peaked heart rates in excess of 160 beats/minute before beginning the dive.

Extreme fatigue can have a serious effect on individuals who are at risk for arrhythmias. Coupled with the effect of cold on cardiovascular performance, the importance of minimizing fatigue cannot be overemphasized.

Equipment. In breathing compressed air in a cold water, as Eldridge observes, the air in the tank can be cold enough to elicit cold air inhalation reflexes. The air you breathe in is cold and dry; the air you exhale is warm and moist. The process of warming and moistening cold, dry air incurs a certain amount of respiratory heat loss even under optimal diving conditions. In cold water, the problem worsens.

A properly fitting wet suit or dry suit should minimize or prevent water from entering the suit, a result largely dependent upon an adequate neck dam or neck seal (as well as cuffs and leg seals). The placement of the average neck seal is precisely on the carotid artery and pressure upon the carotid sinus can produce a slowing of the heart. Eldridge notes that people with coronary arteriosclerosis show the highest incidence and degree of response to carotid pressure, followed by those with hypertension and other cardiovascular problems. She also notes that the response is more prevalent in males and increases with age and can lead to serious cardiac arrhythmias.

Age. The middle-aged male is at high risk for cardiovascular stress in many forms of strenuous activity. Physical changes associated with normal aging are to be considered in assessing risk, to be sure. One sign that should be monitored is the premature ventricular contraction (PVC) -- a change in the heart rhythm in which a beat occurs out of normal pattern. PVCs, as B. Lown notes, occur in normal individuals; they are rare before the age of 20, occur with frequency between the ages of 40 and 50, and are to be expected in those over 60. Lown states that

there is a growing body of evidence that in persons with known coronary heart disease, PVCs found on even a single recorded standard electrocardiogram warn of an increased risk for sudden cardiac death. PVC incidence increases in cold water. Cold environments, even without the added stimulus of water, are arrhythmogenic and special care should be exercised, especially by older males.

Sex. Older males appear clearly to be at higher risk than other segments of the population. Females tend to lag twenty years behind in risk, although increased stress involvement and cigarette-smoking may narrow the gap.

Stress and panic. Lown notes that psychological stresses may provoke major ventricular arrhythmias and lower the vulnerable period threshold for ventricular fibrillation. Increased heart rate, sweating, muscle tension, and changes in respiration rate and pattern are the physiological consequences of stress and impending panic, which inevitably lead to worsening the diver's situation. Rapid, shallow breathing, for example, is a common sign of panic. It leads to inadequate ventilation because the air is not moved sufficiently to maintain a balance of oxygen and carbon dioxide. The inadequate ventilation can exacerbate a sense of air hunger and further accelerate the panic. The stress activates the sympathetic nervous system, increasing heart rate to a potentially dangerous level. In cold water, in particular, the risk of an arrhythmia is high. And, as we have seen, the possibility of a loss of consciousness is very high.

A diver who is not in optimal physical condition is at higher risk of experiencing stress and other physiological changes that may occur in a diving situation. In addition to maintaining ideal physical condition, the only means of reducing the potential for panic is to be properly trained, with the skills needed for coping with situations that arise. One must have the self-confidence to be able to solve problem situations.

Conclusion

Divers with any stage of cardiac disease are at a

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much higher risk of sudden death while diving due to the interaction of the stressful environment of diving on a unhealthy heart. Males older than 35, especially those who diving in colder waters, are well-advised to have a proper cardio-vascular evaluation by their physician to determine their personal risk.

The authors of this article are Arthur J. Bachrach, Ph.D. and Glen H. Egstrom, Ph.D. Bachrach, who retired as head of the Environment Stress Program Center, Naval Medical Research Institute, National Naval Medical Center, now lives in Taos, NM and operates Moby Dickens, a bookstore. Egstrom, Professor of Kiniseology at UCLA, is currently president of the American Academy of Underwater Science.

Getting Bent By Computer

-- A Diver's Story

Bill Lovin, an underwater cinematographer from Chapel Hill, North Carolina, got bent while on assignment. The incident occurred nearly three years ago, but the story continues. We include this as a supplement to our series on computers and computer diving.

★ ★ ★ ★ ★ ★ ★ ★

To me, "bottom time is money." I produce underwater films and the ability to spend more time on the bottom translates into more film shots.

Many of my dives fall into the same profiles as many sport divers, that is, Caribbean wall dives with deep penetrations -- and a significant amount of time spent in shallow water. To maximize my bottom time, I settled on the Edge and tested it during 60 dives in the Caribbean and Red Sea against a calibrated precision depth gauge and the U.S. Navy Dive Tables. In all of those sixty dives my computer gave extremely accurate depth readings while allowing incredibly more bottom time. I felt comfortable with the computer and trusted it completely.

Soon I began shooting for a wreck diving movie. During one of my dives I suffered decompression sickness while well within the limits prescribed by my computer.

It is impossible to describe the physical and emotional trauma to someone who has never stared for long hours at the ceiling of a recompression chamber. My bends began as a curious sensation in my elbow which I can only describe as the same feeling I get

when I swim over to another diver and feel thousands of exhaled bubbles over my body. It migrated quickly up my arm and into my shoulder, where it just plain hurt. The feeling ranged from, at its worst, six needles stuck in my arm to feeling like I severely overdid it playing tennis at its best. Additionally, I felt a strong tingling sensation in my fingers and an almost complete loss of strength. A can of soda fell out of my hand while I was watching it.

"At first, I completely denied the possibility that I might be bent."

At first, I completely denied the possibility that I might be bent. I lay down with my feet up and didn't move, but also didn't tell anyone I felt bad. The boat trip home was three hours, and I just kept telling myself that I had wrenched my arm and the pain would go away. Looking back, it seems ridiculous, but this was serious denial.

Once on shore, I felt better, but the act of getting up and unloading the gear rekindled the pain. By this time I had begun to accept the fact that I might have "minor" DCS. Only after I was in the car heading home did I tell my diving companion that I was sick. Always prepared, she had carried oxygen on the dive and I agreed without much hesitation that I ought to breathe oxygen on the way home (about three hours).

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During the trip home, the pain would get better and then worse. Still, I did not even consider the possibility that I might require treatment.

Six hours after surfacing and onset of symptoms, I was home in bed. The pain had not diminished; it was getting worse. I made a most uncomfortable decision to call for medical help, something that I viewed as an ultimate failure.

I live only 12 miles from Duke University, site of the F.G. Hall Hyperbaric Lab and the Divers Alert Network. I was completely familiar with DAN and had friends who worked there, but it was still amazing to me that when I dialed that telephone number (the emergency number, which made it even harder), within minutes I was talking with a physician expert in diving medicine.

In less than an hour I was at the Duke University Emergency Room, met by three physicians all arranged with incredible smoothness by DAN. Thirty minutes later I was in one of the huge chambers at F.G. Hall Lab with a nurse, while two doctors, a chamber engineer and another hyperbaric nurse ran things outside. My treatment was accomplished in three and one-half hours. Still, it gave me a good deal of time to think.

I found myself totally embarrassed by the situation. It was a Saturday night and I couldn't help thinking about what each of these people were doing when they were rudely summoned to work in the middle of the night. When I walked out of that chamber at 2:00 A.M., I still felt some pain. It would take several more days to go away, but I knew I had done the right thing in seeking treatment.

My treatment cost was about \$1,500, and I got off *light*. That 14 minutes of decompression I didn't take cost me roughly \$100 per minute. It also cost me a good deal of anxiety and depression -- and a lot of time. For the months following I was required to have many neurological examinations.

Three months later I still felt the effects of being bent. Deep dives and dives in very cold water rekindle the shoulder pain (not as bad, but *very* noticeable). Three years later my shoulder only hurts when there is a change in the weather or a sudden change in temperature, much like arthritis.

When I was in the chamber I thought a great deal about the dives that led to my being there. Although my computer had suggested that no decompression was required after my second dive, the U.S. Navy dive tables suggested that 14 minutes at ten feet might have been a good idea.

"Perhaps our desire for those extra minutes on the bottom and fewer minutes on the line has become too great."

Perhaps our desire for those extra minutes on the

bottom and fewer minutes on the line has become too great. Today when I dive I spend as much time hanging on the line as on the bottom. I still use my Edge, but I don't blindly trust it. I keep close tabs on it and carry a backup Skinny Dipper, a backup depth gauge, a backup time, and a U.S. Navy Dive table permanently cemented to each of my camera housings. I always make sure that the pixel display on the decompression computer has moved well away from the "mythical" danger line before I surface. I will not again become complacent and overly trusting of any computer.

But I do believe that the use of decompression computers is valid. There is every reason to believe that figuring our decompression time using so-called multi-level tables should work. But I suspect that we are in an "experimental" situation where we are the guinea pigs. Nonetheless, I believe that a person's health and welfare is that person's own responsibility. Unless we are deliberately deceived then I feel we essentially pay our money and take our chances by making our own choices based on our own knowledge and inclinations.

You must never feel embarrassed or reluctant to seek help following any diving accident. This is no time for "macho." I was told that breathing oxygen probably saved me from greater problems . . . there was oxygen on board the boat, but I was too embarrassed to ask for it. I could have essentially begun treatment three hours earlier and, perhaps, saved myself from even more long-term effects.

Join the Divers Alert Network. DAN is currently doing exhaustive research on decompression for sport divers, and provides a compassionate and knowledgeable voice on the other end of the telephone when that emergency happens.

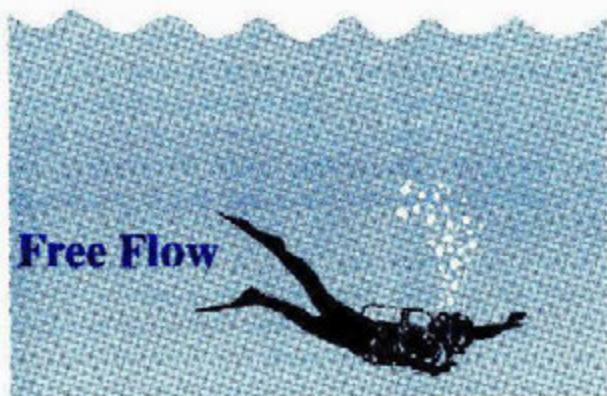
Editor's note: Lovin continues with his cinematography off the North Carolina Coast and in the Great Lakes, but limits his depth to a maximum of 150 feet and never misses a stop at 20 feet or ten feet. He speaks of his bends incidents to groups around the country, stressing his experience and the need for rapid treatment. He also has another insight into his Edge.

"Interestingly, the depth transducer on my computer failed on the first dive I made after being bent. It produced increasingly erroneous depth indications until it was as far as fifty feet off. Is it possible that I was bent because the computer was using incorrect depths supplied by a faulty transducer? I would assume that depth would not have to be far off to push a diver into the 'danger zone.' It seems to me that the weak link in the computer can be the depth transducer (which converts depth information from an analog form to a form that can be processed by the computer)."

To get more information about DAN, write Box 3823, Duke University Medical Center, Durham, NC

27710 or call 1-919/684-2948. The \$40 annual membership fee includes a newsletter and insurance

to cover the costs of treatment for decompression injuries.



If you treasure the peace and quiet underwater, it's a good thing you weren't diving on Florida's Looe Key on July 8. It was the Underwater Music Festival and for three hours, a Florida Keys radio station blasted tunes by Jimmy Buffett and the Beach Boys through six underwater speakers. "When music is broadcast underwater it seems to envelop you from all directions," said Bill Becker, the station's news director and coordinator of the event. "Because sound travels five times faster underwater than it does in the air, it generates an unforgettable effect." What Becker didn't say is how he can justify destroying the sanctity of a marine sanctuary with rock and roll. Apparently, the 375 divers and snorkelers who joined in didn't care about the answer to such an ethical probe.

A few months ago, a Detroit jury awarded a \$5.2 million judgment against Soniform Inc., for negligence in the manufacturing of an oral inflation valve that led to the death of 32-year-old Philip Slowik in 1983. A relatively inexperienced diver, Slowik was 45 feet below the surface when the valve malfunctioned. He panicked, threw off his equipment and shot to the surface without exhaling. He died from a brain embolism. The family's attorney argued that the valve stuck open due to an oversized spring valve guide. While this valve is no longer manufactured, it apparently had been supplied to many brands of BCs, although neither the attorney for the plaintiff nor Soniform representatives would disclose to *Undercurrent* what other manufacturers have used it. Ken Bell, corporate counsel for the Coleman Company, which owns Soniform, told us

that "there is nothing wrong with that valve. I have it on my equipment and see no reason to change it." They are appealing the verdict.

The 36-foot *Seahorse*, a charter dive boat out of Savannah, Georgia, had several divers in the water on July 2. It also had its engine running and its propellers turning. Two divers surfaced into those propellers. Both received multiple cuts and died immediately.

A while back we reported that a prescribed mixture of oxygen and compressed air, called "Nitrox," is being used by trained sport divers to provide as much as twice the bottom time at certain depths. Now, we have learned from Luxfer, the manufacturer of most aluminum tanks on the market, that some divers are now taking it upon themselves to put oxygen into an empty tank before adding compressed air. That's risky business. You see, the lubricants used to put valves into scuba tanks are ignitable, and since oxygen feeds sparks and fires, there is a substantially increased risk of ignition, fire, and rupture.

It's extremely rare for sharks to attack scuba divers, but this summer they have declared open season on freediving spearfishers. Richard Froias, 26, had a 30-pound grouper strapped to his belt while snorkeling in 10 feet of water, 500 feet off the Naples, Florida shore. A 5-foot blacktip shark put 10 deep teethmarks into his left calf. In the Bahamas, Judy St. Clair, a 31-year-old scuba instructor from Marathon, Florida, surfaced with a speared fish in her hand. A shark took the fish . . . and her hand.

A columnist in the British magazine *Diver* has just presented his Beachcomber Award for Useless Marine Activity to us Americans: "Those awful Americans," he writes, "are sinking a 312-foot World War II submarine, the *USS Turbot*, specially for divers in 60 feet of water off the Miami coast. The boat, which never saw war service, was used for research and the conning tower was removed. When I tell you that the sinking committee plan to build a facsimile conning tower and attach it to the sub before sinking it, and that the sub will then be sealed to stop diver penetration, you will realize why I have given them the award. If ever there was a Useless Marine Activity, this surely is it."

Undercurrent editors welcome comments, suggestions, resort/travel reports and manuscripts from readers of *Undercurrent*.

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