

undercurrent®

THE PRIVATE, EXCLUSIVE GUIDE FOR SERIOUS DIVERS

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Hedonism II, Negril Beach, Jamaica

—We don't mess around, hey!

"Now if you sample the ganja," our host explained to his thirty new guests, "begin with only a puff or two. Our ganja here in Jamaica is very powerful, you know, so if you're not used to it then get used to it slowly....And the same goes for the mushrooms, which you may sample as mushroom tea at Mrs. Brown's. You may order a taxi to Mrs. Brown's at the front desk."

Late for the orientation, I had just walked in from the bright sunshine to the cavern-like disco, which was illuminated only by two large, aquarium windows offering views into the main swimming pool. I wasn't sure I could believe what I was hearing, but the nervous chitters from three silly geese from Jersey made me realize that I was not hallucinating. At least not yet.

"The beach on the left," he continued, "is the regular beach. In the center it's permissible to go topless. The beach on the right, past the water sports shop, is the nude beach....No pictures please.... Here at Hedonism II you can do whatever you want to do, as long as it pleases the person you're with." With that, two nude bodies slowly drifted down in the pool, into our sight. The two young men, who after inspection should have been more modest than they were, came to greet the newcomers by performing what one person said was a reverse moon. Heaven forbid!

And there, my friends, was my introduction to Hedonism II. Of course, I objected, but not publicly. After all, I didn't come here to behave in any way other than I permit myself to behave at home. I was not about to return to fraternity days. Nor would I allow the sun to strike body parts which have never seen the light of day. So I was relieved when our host ended his pitch with the Hedonism II war cry...."we don't mess around, hey!" "Thank God," I muttered.

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I had first stepped onto Negril Beach back in 1973. It was just being discovered. The quiet little Sundowner Hotel seemed a world away from urban civilization, and indeed it was, being at least an hour away from Montego Bay via a tight and tortuous road. The palm-decked beach was as serene as one could imagine and the loudest noises at night were moonbeams bouncing off the soft ripples of the sea. When I learned that Negril Beach Village was being constructed nearby, I cried buckets, and vowed never to return to a beach sure to be destroyed by developers. As the years passed I began to hear tales of the Village and claims that it was

Create Your Own Tourist Attraction

Pennecamp Preserve has its own underwater Christ, a well-photographed structure which no doubt serves to attract many divers to the area. So, resort operators and tourist associations, why not have your own underwater sculpture?

Ceramic artists Peter King and Kathy Allen want to be your sculptors. Both divers, they'd like the opportunity to construct an underwater *object d'art* especially for an appreciative resort. And, they promise, *not* at New York prices. If you're interested, you may contact either at the Stonehaus, 2617 North 12th Ave., Pensacola, Florida 32503 (904/438-3273.)

the party resort of the western hemisphere. Even more disgusted, I renewed my vow never to return. It was only when Time magazine called the Village "raunchier" than Club Med did I realize that I must travel there. After all, you readers would have to be protected against raunch, no matter what the form, and I would sacrifice myself and suffer through a review to inform you, no matter what the cost. Then, when I learned the cost was \$995 for seven nights at the hotel, all meals, diving, and even round-trip airfare from San Francisco included, I knew the devil had his hand in this one. I dragged myself to the airport, in the name of virtue, for the next flight out.

Yet, I nearly canceled my flight. Embarrassed as I was to tell my friends that I was headed off to a hotel with the reputation of a singles bar, I nearly fainted when I learned the name of Negril Beach Village has been changed to, would you believe, Hedonism II. Painfully I wrote my check to my travel agent, who grinned lasciviously as he stuffed it into his wallet. "Take lots of protection," he said. "I'm never bothered by the sun," I responded. "That's not what I had in mind," he replied.

No doubt he meant that I should get a polio booster, for I had learned that an epidemic had been declared in Jamaica just four months before my early September departure. My agent knew nothing about it, but after calls to the Public Health Service and the National Disease Control Center I learned that, sure enough, more than 50 cases of polio had been reported in Jamaica, though they were confined to one small district and had touched no tourists. After an emergency immunization program, the epidemic had been declared over. Nevertheless, I got a booster, for I knew that if I were to enter the Devil's playground, I would need all the protection I could get.

After an all night flight, I landed in muggy Montego Bay, with my poison pen poised. I was ushered into an air conditioned bus and noted that there were twelve heterosexual couples aboard, and me and my all-male buddy. I protested, "I must have boarded the wrong bus." Our hostess handed me a Red Stripe, smiled, and said to cool it. After a 90-minute foray, we arrived at Hedonism II to the strains of a reggae calypso group, who appeared to have been straining long before Belafonte was born. "Your room is not quite ready (it was, after all, only 10 am), so please have a drink at the bar and come back in 20 minutes." Any other place would have handed me a complimentary rum punch, I groused to my associate; but once at the bar I noticed no money was changing hands. "There's only one

Fee, mon. The drinks is included." I crossed myself and ordered a double. And looked around. There was nothing but normal people. Having breakfast. Chatting. Floating in the pool. And what a lovely, open air dining area. Large. Tropical white tables and chairs to seat a hundred or more. An amphitheatre setting with a stage loaded with mikes and speakers and drums and guitars and and someone announcing a bus to the airport and saying goodbyes. People hugging. "Your room is now ready, sir." It was but a short walk to a condominium style, clean and orderly, air conditioned little room with two twin beds. I handed my hardworking porter a couple of bucks. He raised his hand, palm out. "No tipping, mon. It's not allowed." Welcome to Hedonism II.

Red Stripe beer after a red eye flight left me with no memory of my first day at Hedonism II, though somewhere along the way I had the presence of mind to sign up for the next day's dive. "First dive's deep, at 9:30 am," said the stonefaced director of Watersports, Bill Elkington, "but first time divers have to take the shallow dive at 11:30 am. If you have your c-card, that is. If not, you have to be tested." I must have had my card, because I don't remember having to be tested. I was assigned to tomorrow's 11:30 boat, and only hoped I'd wake up in time to make it.

But the next morning I found myself surprisingly chipper. Rarin' to go, I showed up for the shallow dive, joining a foursome (actually 2 plus one plus one) from Pensacola and a fellow from Boca Raton. We toted our tanks thirty yards to the awning-covered slow-moving dive boat, climbed aboard, and headed out on the mirrored sea. Now I have dived these Negril waters before and knew what to expect. Not a hell of a lot. Anything big enough to swallow a hook or slip into a trap is stewed by Jamaican fishermen to supplement their protein-poor diet, so many of the reefs have been left to the black sea urchins, who have dug in deeper than the Marines at Iwo Jima. But there are a few pleasant reefs for novice divers, so who's to complain at Hedonism II?

Divemaster Ernie Crooks provided a stern briefing on safety and signals, told us to buddy up, then wait at the anchor line. The dive, at 50 feet, was uneventful. With Ernie in the lead and us in loose formation, we cruised a number of little ledges decorated with a few nice sponges and corals, watched abundant fairy basslets (sometimes the biggest fish in sight) swim on their backs, swam into a school of at least a thousand blue chromis (that I loved!), stirred up a small stingray, and were ordered to surface after the first diver dropped to 500 psi. I had 1300 psi left from a 2900 fill.

As I recollect, I made a few more dives. The next day, at 80 feet, a sonic regulator honked and whistled, and Ernie rushed to the rookie diver with his octopus. Ernie stroked his neck to ask if the rookie was out of air. The rookie nodded. We all surfaced; this time I had 1300 psi and the diver proved not to be out of air. He didn't understand the signal. Another day we surfaced when I had 1100 psi. Otherwise, the dives were pleasant and calming. First timers gushed over the nice variety of sponges, an ocean trigger floating off in the distance, arrow crabs close up, and the fluttering black durgons, the biggest fish I saw. Ernie kept a close eye on his charges, the man above in the boat hurried over when we surfaced, and except for the rope ladder hanging over the side of the boat, everything was hunky dory. The rule is only one dive a day, but I was told I could have a second if the boat wasn't full. The boat wasn't full, but the pool was. I chose the pool.

HEDONISM II, NEGRIL BEACH, JAMAICA

Diving for Beginners	★ ★ ★ ½
Diving for old pros	★
Beach Snorkeling (off property)	★ ★ ★
Meals	★ ★ ★ ★
Hotel	★ ★ ★ ★ ★
Money's worth	★ ★ ★ ★ ★
*****excellent, ****good, ***average, **fair *poor.	

And I also chose the nude beach--everyday--where the camaraderie was special. For some reason, unlike clothed people, naked people sit around and talk to each other, getting drinks by the dozen, smoking spliffs, telling jokes, and having a good old time. At the other beaches, where t's and a's were covered, people read books or acted like they do at Coney Island. The only lead ballon was a crudity named Ralph who, with two underwater Minoltas strapped around his otherwise naked body, took a few indiscreet shots of the others. But, who cared. He was only a jerk. When anyone would start to get uptight, a rasta man with dreadlocks who called himself "Smokey" would stroke by in his dugout, offering ganja at \$20 a lid. The hotel guard would make some prefuntory effort to motion him away, but in waist deep water business was always transacted. Jamaica? No problems!

The physical culturists hung out (hanged out? whatever....) at the pool, where waist deep volleyball was as good as anything to occupy the time. (Lest you get the wrong idea, clothes were the rule until midnight). Others went horseback riding. Some took the morning bike trip to Negril. Urbanites boarded buses for tours of Ocho Rios or other exotic places. The more serious people worked out on the Nautilus machines or joined the 4pm, bi-weekly exercise class. The staff organized competitions in the pool once a week, as well as a big beach volley ball game (which was canceled by a giant lightning and thunderstorm whose warning, I'm shocked to say, no one heeded). On any day one may walk down the beach to get towed around the Bay while dangling from a splashy parachute. (\$20 U.S.)

So, where's the raunch? Most certainly on the little island at the bi-weekly beach party, where Daniel--Svelte Daniel--leads his innocents into oblivion. God help them. After finding myself forced--absolutely forced--to imbibe two full fifths of rum punch for failing to play a group game (with an unspeakable name) properly, I prayed for dear Daniel's salvation, but tired quickly of that crap and boogied to the band and snorkeled in three feet of water, instead. Thirty other sinners stumbled around entirely out of their minds, while another thirty sat and giggled.

A Return To Our Roots

In 1973, I read a wonderful story, complete with descriptions of the abundant tropical fish and photos of long and soft sandy beaches, of Jamaica's own "diver's hotel," the Chalet Caribe. I scraped together enough savings to journey there for my first tropical vacation, and it was nothing of the sort. There weren't many fish, there was no sandy beach, and for half the nights of my stay my buddy and I were the only people in the dining room at this "diver's hotel."

But thanks to the Chalet Caribe, I and an associate got the idea for *Undercurrent*. After all, if a man so wise as I got fooled, what about everyone else?

I returned to the Chalet Caribe in 1975 for a brief review for our premier issue. Seven years later, in September, I returned again. The service in the dining room was just as slow. Six of us, the only customers, waited an hour to be served lunch, but only after we were told that we would have a longer wait for chicken salad because the chicken would have to be cooked. We tried for dinner at 8:30, but the dining room had closed. But I shouldn't be harsh, things move slowly in the tropics. The small hotel is pleasant, the rooms are decent, the people kind, the prices right. A double runs about \$30/night.

As for diving, I suspect the Chalet Caribe reef is the best in Jamaica. The drop off, a swim of 150 yards or so from the beach, has canyons, and crannies, and cuts and ledges, all decorated with scintillating sponges and other stationary flora and fauna. The depths run well below 100 feet. It's really quite nice, although just like any other Jamaican spot, there aren't many fish, and those that are are the commoners: damselfish, big eyes, blueheads, and so forth.

Two or three dives here are quite nice. A week for a hard core diver would be a bit much. Our guide, Hani, who has been running the shop for several years, is damn competent and quite pleasant. When one of our group ran low of air at 80 feet she calmly swam over, switched tanks, and gave us all the time to empty our own bottles before we had to depart.

For novices--especially honeymooners--the Chalet Caribe is worth some consideration. For a brochure write P.O. Box 365, Spring Gardens, Montego Bay, Jamaica, W.I.

CC., travel editor

And if that's not enough, on the other days, people are called out of the lunchtime crowd to participate in such debauchery as "pass the bamboo." Some people, ladies that they were, even volunteered themselves for the wet t-shirt contest.

One day I wised up and joined my four friends from Pensacola who, it turned out, were camping at Little Bloody Bay. (They had paid about \$20 U.S. for full day's use of Hedonism II, including diving, lunch, and the open bar.) There I found some decent snorkeling (there's also decent snorkeling outside the compound, about 200 yards north) and one damn good diving buddy, whom I joined later at the Chalet Caribe (see insert). A Jamaican fisherman cooked us a damsel fish stew, told me that the scorpion fish I nearly put my hand on was really a "poison grouper," and said about the only fish they don't eat are trumpets.

I thanked him for the damsel, returned to Hedonism for my first nap, then dined on the night's fare, which included crispy chicken, baked fish (must have been imported), a hearty stew, potatoes, vegetables--brussel sprouts or breadfruit--a dozen salads, and as many helpings as I could eat. Oh, this evil place. The abundance of food, served cafeteria style, was almost always well-prepared and sometimes downright delicious. There were two or three entrees at lunch and dinner, a supporting cast of dozens of dishes, plates of cheeses and pastries, free wine and booze and, of course, free fat around the waist. Breakfasts were just as abundant. If you wanted a pound of bacon, take it.

Well, dear readers, I could go on about this hell hole forever, but by now you have the point. If you've been to a Club Med, this place is looser, cheaper, easier to get away from the organization, freer with the herb, and everything that I've reported. Under no circumstances, therefore, can I, or will I, recommend it. In fact, I was so disappointed with my trip, so disturbed by, so disgusted by it, that I must return to warn others there about the dangers. If they don't heed my warnings, I will photograph them and send their pictures to their mothers. Look for me with the Minoltas around my waist.

Diver's Compass: Most travel agents have cheap packages to Hedonism II... Water temperature in early September was surely in the low 80's; visibility ran from 80 feet upwards...I rented a car and picked up half-a-dozen local hitchhikers--Jamaica, No Problems!--the climate for tourists has changed, indeed. ...dive equipment is new and well kept; since the diving is calm and relatively uninteresting, consider leaving your own gear at home (but bring your mask, fins and snorkels, since the supply is short)...hotel car rental with insurance runs \$30+/day, with miles additional...hotel shops carry magazines, over-the-counter drugs, gifts, shirts and shorts...exchange rate at the hotel is \$1.75 Jamaican for \$1 U.S.; I got \$2 in the parking lot and friends haggled for \$2.50 on the island's other side...dress as you like at dinner, but the environs are classy so long pants and dresses add style...a few bugs bite, but not excessively (except on the beach at night).

Skinny Dipping Scuba Diving

—Our Travel Editor's Urge To Undress Underwater

On my recent trip to Jamaica, I got my first chance to drop my trousers and snorkel in the altogether. At first I kept my eyes peeled for monstrous morays and darting barracuda, but after awhile, when I became accustomed to the seawater sensations (and my self-perception became more aligned with my own

physical reality) I settled into what proved to be a truly free and sensual experience. Indeed, a simple pair of swim trunks restricted the sensation of my self submerged in the sea. Once nude, I at first felt unprotected, yet soon I became integrated with the watery universe. During my Jamaican stay I made a

couple more stripped-down snorkeling forays, and had there been much in the way of beach diving I would have grabbed a tank to take a shot at skinny scuba.

Of course, there were certain realities I would have had to consider. Luckily, I dive with a wrap-around BC, so I don't have to wonder what to do with the crotch strap. But I would have to learn what to do about pesky damsel fish, who have a knack for nipping where they shouldn't. And what would I do if I were to meet other divers below? Smile and nod? Act shocked that my suit was missing? Hide behind a coral head? Carry my camera a bit lower? I'd just have to figure it out.

Safely at home now, I suppose I should have simply tumbled overboard from the dive boat, dropped my suit in the water, stuffed it in my BC pocket, and proceeded on the dive without calling attention to myself. At Hedonism II, no one would have given it a second thought, which is either a testimony to the freedom of the guests at the hotel, or a commentary on what I have to offer. Either way, it would have worked out just fine.

Though I find it a bit odd that I might want to disrobe for a dive, I have since learned there are other bare-bottomed scuba enthusiasts in this world. Even dear friends have owned up to skinny scuba diving while on charter boats in the Caribbean, and plenty of my pals have admitted to snorkeling stark at deserted beaches. And a long-time buddy confessed he stripped just about every time he went snorkeling in tropical climes. Only he did it after he entered the water. "Where do you put your suit?" I asked. "I hang it from my snorkel," he responded.

Once I discovered all this devotion to disrobed diving, I figured there must be somebody who organizes it, and sure enough I found there's even the semblance of a club for those who like to dive without garments. The organizer—Rich Greenberg of Van Nuys, California (where else?)—has put out three newsletters for skinny-dipping scuba divers. I called Rich, who says his fledgling group may not be around much longer. "I don't have enough new information to put out a fourth newsletter. I had hoped that our readers would provide me with ample information, but so far, with only 23 names on our mailing list, I just haven't got enough support to put out a national newsletter."

Nevertheless, Greenberg's newsletter provides some useful tips for potential underwater naturists, and some interesting comments from readers about where one might go to engage in nude diving. He came up with one full-fledged naturist resort with first-class diving—the Kona Diving Lodge (which unfortunately, has since been closed due to the discovery that the local zoning laws permitted only residential, not commercial activity).

Whether Greenberg continues with his newsletter will be decided by popular demand. If he gets support from other skinny scuba buffs, more issues will follow. To add your support write Rich Greenberg at 13624 Sherman Way, #433, Van Nuys, CA 91405.

Naturist—as the erudite call nudity—information relevant to scuba divers and snorkelers can be found in a recently published book, the *World Guide to Nude Beaches and Recreation*, by Lee Baxandall. The book describes beaches in 44 states, six Canadian provinces, fourteen Caribbean locations, and in Europe, Africa, the Middle East, the Far East and the South Pacific. Illustrated with plenty of sensuous (and sometimes sensual) color and black and white photos, the book not only specifies beaches at which one may disrobe without fear of being pinched by gigolos or gendarmes, but also lists a few resorts which, in one fashion or another, permit naturism. It's a useful book, so if your book store proves too prudish, order directly from the authors by sending \$13.95 to: Free Beaches Documentation Center, P.O. Box 132, Oshkosh, Wisconsin 54902.

Author Baxandall also publishes a tasteful periodical *Clothed with the Sun: The Quarterly Journal of Clothes-Optional Living*. Illustrated topics in a recent issue include bare backcountry, families fitness, gay awareness, hot tubs and spas, massage, sex equality, singles sites, spirituality, water sports, participating clubs and groups, etc. It's available for \$15 per year from: The Naturists, P.O. Box 132, Oshkosh, Wisconsin 54902.

I can only conclude by saying that I've yet to try diving in the buff, but I have no doubt that I will. The next time you see a diver aboard your dive boat, sitting there with no trunks—and no crotch strap—it may very well be me. I'll be happy to shake your hand. But, please don't be offended if I fail to stand up.

C.C. Travel Editor

The Techniques For Diving Alone

—Thoughts On A Taboo Topic

In July, 1978, we published an article by Lou Fead, entitled *Never Dive Alone: An axiom in need of a challenge*. Fead wrote:

"A solo diver is one who when in the water cannot communicate with any other person. If you are in the

water with other divers but cannot attract anyone's attention, you are alone. If you pass through the surf with your buddy and separate to hunt lobsters you are both diving alone. If you and your submerged buddy are on the opposite sides of a patch reef or separated

by clusters of kelp, you both are alone. If you are inside a wreck and your buddy is outside, you are diving alone. If everyone is topside in the boat and you're decompressing or just burning up the last few hundred pounds of air, you're diving alone. Everyone who has been diving has been diving alone."

Fead went on to explain how he dives alone—dives without taking a buddy along—and enjoys it. He concludes with:

"So what we all tout as an inviolable rule—never dive alone—we all violate, intentionally or unintentionally. Instructors never speak about it. Books, magazines and manuals never talk about it. Nevertheless, diving alone is an integral part of our sport. Since it's practiced it ought to be taught. And since it's practiced, there ought to be a new rule about buddy diving which makes sense. My rule is:

"Diving alone has its risks. If you are a responsible diver, if you accept the risks and have prepared yourself for them, then your solo dives can be enjoyable and safe. That's what good diving is all about."

In this article, Fead explains how to prepare yourself for solo diving. His ideas buck the conventional wisdom of diving, and they need to be heard.

* * * * *

Have you made more than 50 open water dives?

Are you capable of surviving routine dives without any assistance, physical or mental, from a diving buddy?

"Yes" answers to the above mean you're probably experienced and capable enough to discuss another kind of sport diving—*SOLO DIVING*.

Solo Diving lets you satisfy the sudden urge for a dive immediately. It lets you linger underwater wherever and for however long you want—or jet away at full speed—or do whatever strikes your fancy. It even lets you change your mind at any time and not dive if that be your pleasure.

That's the main benefit of Solo Diving. . . diving with a freedom of choice not hassled by any other humans.

Without a buddy, the burden for enjoyment is on the soloist. There's no one else to point out attractions, share the dive delights, or swear to the size of the one that got away. All that comes with the camaraderie that most buddy divers say attracts them to the buddy system.

You can be ready to dive solo if you'll accept the responsibility for your own enjoyment, your own actions, and your own safety in the water. Accepting those responsibilities may be difficult in this day of suing someone else for not protecting you from yourself, but if you want to leave the beaten path and solo successfully, all you have to do is *plan* adequately to meet the personal responsibilities of solo diving to enjoy that special sport.

The Land Plan For Your Solo Dive

Planning differs from that for a buddy dive mainly in that it doesn't involve anyone else, obviously. In fact, the best solo dive planning is done to *eliminate the need for anyone else*.

There is one situation, however, in which even the finest of solo planning cannot achieve its purpose of eliminating the need for outside assistance. That's when a diver becomes incapacitated in the water. Survival then, without assistance, is just a matter of luck—the major disadvantage of being alone.

Since planning is the crux of a good solo dive, let's discuss the long-term variety where we'll find the first major benefit of diving alone—not having to coordinate your plans with a buddy, not "anybuddy." You can plan your dive to do what you want, when you want, where you want, and why, all without factoring "anybody" else's preferences in.

You wanna go into cold dirty water? You got it—with no squeals from the less adventurous. You wanna dive only in the Tropics? You can have that too, without some macho dummy berating your preference.

Other long-term planning, that of checking equipment, health, and the expected weather, is the same as for buddy dives. Its purpose is to give the greatest chance for a successful dive by confirming that everything's ready for the dive beforehand.

Immediately prior to taking off for a solo dive, take the one action that comes closest to involving a sort of a buddy—tell someone who's staying home where you're going, for how long, and what to do if you don't return as scheduled. You might call that "buddy" your *Search Organizer*—the one who will lead the way to your disabled boat, or your broken down dive van when you're late coming home. So file a dive plan, just as a flier files a flight plan and a boater a boat plan, to schedule some help in case of unforeseen breakdown.

The next step in planning comes at the dive site—deciding whether or not to dive. After comparing your current personal, physical and mental capabilities to the demands that will be placed on them by the environmental conditions and the in-water dive plan, your decision should be based on whether you can have fun safely.

Being alone for this decision makes it all yours. There's no one else to influence you, to stop you from diving when you shouldn't, or coerce you into diving when you don't want to. As a solo diver, you can decide "to hell with it," pack up your gear, and go biking without feeling you have to justify your decision to anyone. Or, you can make a dive in conditions within your capabilities that might not be pleasing to a buddy. The decision to dive or not should be a personal one for all divers, but isn't—egos often stand in the way of common sense when there's an eager, pushy buddy nearby.

The decision to quit at anytime should also be free, without fear of mental retribution from anyone else.

SEA BUDDY: Planning The Underwater Needs Of Your Solo Dive

An acronym for organizing the details is *SEA BUDDY*. *S* for *signals*, *E* for *emergencies*, *A* for *Activities*, and *BUDDY* for *buddy gear check*.

Signals of the diver-to-diver variety aren't patently necessary for a solo diver, but those summoning help in a sticky situation are. A whistle, a flare, perhaps a mirror can be carried for attracting attention. A float and flag tell others where you are—and double as surface support for carrying goodie bags. Of course, the standard sport diving signals should be known for interfacing with any other divers you might meet under water.

Emergencies are somewhat the same for solo as for buddies—out-of-air, entanglement, and surfacing down current. For a solo diver there will be no "lost buddy" emergency. On the other hand, the solo diver can face another more serious emergency—"incapacitation."

Unconsciousness, cramps and fatigue cause more trouble for a solo diver than the inconvenience they do for buddy divers. A solo diver has no one to count on for help when incapacitation strikes. A solo diver unable to help him or herself can only hope for the best.

The best emergency plan for solo divers therefore is to avoid situations which generate emergencies, especially the incapacitating kind.

Out-of-air, for instance, can be eliminated simply by never depleting your air supply before terminating the dive. For further backup in case of unlikely equipment failure, there are pony bottles, BCs which can be breathed from, redundant second stages, and even separate regulators mounted on Y-valves. Practice with a backup is necessary, just like practice with buddy breathing is necessary to make an out-of-air option ready for use. Saving some air for the surface is by far the best technique.

Entanglement can be avoided by watching where you're going, and is usually corrected by backing out or doffing gear. Surfacing down current from your boat or beach exit is better avoided than corrected—dive upstream, stay upstream, and know where you are at all times.

As for "emergencies" on the boat or beach—dead battery, lost keys, flat tire, out-a-gas, etc.—a CB or VHF radio is mighty handy for summoning assistance. An obvious "emergency" card, like MedAlert, can also be a lifesaver in case a non-diver finds you passed out. The best contingency is still a capable buddy—even a dry one is better than none at all.

Activities, the *A* in *SEA BUDDY* includes what you're going to do for fun, and the *limits* within which you'll do it. Maximum depth, maximum time, and minimum air pressure—the limits—are not for changing underwater where narcosis can muddle your thinking. To abide by the limits, you'll need your own depth gauge, time piece, and air pressure gauge, of course—you've got no buddy to supply them for you.

Depth and time limits recommended for solo divers are those for "no decompression" diving. Pushing or exceeding the "no-decom" tables can put your solo dive into the disaster category for several reasons: (1) no buddy to confirm your calculations, (2) no buddy with instruments to compare, (3) no buddy with spare air, and, (4) no buddy to help if you do get hit.

The minimum air pressure limit is best interpreted for two specific occasions on your solo dive—turnaround and surfacing. Turnaround is set for trekking home, with enough air to make it, and then some. Surfacing likewise is done with enough air to solve some last minute problems on the bottom, and some on the surface later. Both pressures should be set with room for errors in location and air consumption predictions.

BUDDY is for the buddy gear check that you'll do on yourself before entering the water. As with a buddy, it's to confirm that your inflators and releases can be

undercurrent®

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used quickly to make you float well for survival. Touch and operate your BC inflators, your weight and tank releases to ensure they're clear and operable.

To feel more comfortable with your "buddy" capabilities, you might even exercise those same operations, and your skills, at the beginning of your dive. Inflate your BC a bit every way you can, doff your weights, your tank, shuck your second stage and retrieve it, clear your mask, breathe without a mask, whatever gives you more confidence underwater. Early, when you have lots of air, you might even try a moderate depth emergency swimming ascent, with your regulator in your mouth, just to retrace that avenue of escape from an out-of-air situation.

With SEA BUDDY out of the way, plunge in for

fun—as a SOLO DIVER. Maintain an awareness of what's going on around you—a "global awareness" so to speak—to avoid emergencies while savoring the wonders of the world under water. And *dive your plan* to have a great solo dive.

For you inveterate buddy divers, at least try the planning procedures in this article. . .they just might make your buddy dives more fun and less hassled.

Author of the book *Easy Diver*, Chief Instructor at UNEXSO in Freeport, fun diver extraordinaire, and corresponding reporter for *UNDERCURRENT*, Lou Fead feels he dives alone most of the time in his work as an instructor/guide.

The Pig, The Owl And The Pussycat

—A Fable of Simplicity and Self Reliance

There was once a pig (a very bumptious, obese and arrogant pig), an owl (a very wise, sensible and responsible owl) and a pussycat (a very beautiful, charming but naive pussycat) who chanced to meet on a tropical island where they had gone for their diving holiday. One sparkling morning they put to sea in a boat (a beautiful pea-green boat, no less) and headed out to an exotic offshore reef. On the way they chatted excitedly about their past deeds and experiences. . .except the owl who listened and winced occasionally at some of the more bombastic statements, especially those of the pig.

"You don't have to worry about me because I'm an experienced instructor," boomed the pig, "and I always insist that my pupils use the very latest in the way of equipment. I sell it in my dive shop, you know." He paused to light a cigarette, flicking the still smouldering match into the bilge.

"My instructor made me buy all the latest equipment too," said the pussycat, "and it was very expensive so it *must* be good! He made us spend hours in the classroom learning all about the theory and techniques of diving, and we had to learn by heart the laws of Henry, Boyle and Dalton and the decompression tables too. We spent more time in the classroom than we did in the water!"

The owl said nothing.

Rummaging in his voluminous dive bag, the pig dragged out a dazzling array of shiny hardware: fittings, clamps and buckles plus a deluge of miscellaneous chrome-plated items. "Look at this!" snuffled the pig proudly, "the latest top-of-the-line RIP-SNORTER Mark Seven, ten stage regulator with fully balanced snot bypasses, multiple saliva outlets and automatic self-clearing mucus recycling valves. Breathes like a dream! Wouldn't use anything else." He then displayed his back pack which consisted of an enormous mass of flaccid rubberized material with

numerous tubes flopping in all directions. "Dig this!" he grunted, "the brand new Unitized Dunkpak Push-Button Buoyancy Compensator and Tank Assembly, put out by the Rigor Mortis Diving Company. It all fits on your back and provides 500 lbs. of lift when you press this button. To deflate it you lift up this tube and press another button. Simple! As it's all in one unit you just inflate it and drop it in the water, then you jump in, slip your arms through the special harness, vent the air and off you go!"

The pussycat gazed at the pig, her eyes wide with adoration. "What a handsome, knowledgeable pig you are," she purred, "and such wonderful equipment!"

The pig grunted with delight and flourished a flamboyant certification card. "I'm a TWIT," he blared arrogantly, "which means that I've passed my Turbulent Water Instructor's Training."

The owl blinked, but remained silent.

The pussycat now began showing off her own new equipment, exclaiming enthusiastically, "My instructor recommended this latest model GAGMASTER regulator with automatic foul language filtration, self-adjusting venturi action puke diverter and a two-way-stretch mouthpiece. And I swear by this perforated, lead-lined, off-the-shoulder sheepskin CADAVER-FLOAT buoyancy compensator with its built-in genuine Swiss cow bells for attracting attention in an emergency. It's also inflated from your tank and is made by the Rupturelung Company." She delved into her bag. "I'm a Mouser with Experience in Open Water," she mewed, producing a gaudy plastic MEOW certification card.

"And what sort of equipment do *you* use, son?" asked the pig patronizingly, turning to the owl.

With an air of complete confidence the owl produced an elderly twin hose regulator, a simple inflatable safety vest and a small weightbelt. There was a long silence.

"Is that all?" breathed the pussycat at last.

"What else do you need?" replied the owl with surprise. "The water's warm so I don't require a wet suit, which means that I won't need buoyancy compensation either. With the right weightbelt I'm just a wee bit negative underwater and I can regulate my buoyancy at will by the way I breathe. Most of all, I'm not dragging an enormous load of cumbersome fancy equipment around with me that just isn't needed on a pleasure dive like this. If I should have a serious emergency, my vest will support me *face up* in the water. . . not like that," the owl indicated the pig's horrendous heap of hardware, "which will float an exhausted diver firmly face down when he needs help the most!"

The pig bristled. "That's a load of hogwash!" he snorted, "why, I always depend on my Dunkpak and I certainly wouldn't dive with anything else, and neither would my pupils. I insist on it! And as for *that*," he broke off, sneering contemptuously at the owl's regulator while his snout curled as if he'd encountered an unexpected pleasant smell under his nostrils, "I thought they'd quit making those things years ago!"

"Yes, it's a Columbus Mark 1, Model 1492 twin hose, single stage regulator," admitted the owl, "but I've only had it for ten years so it's too early to know if I'm going to have any problems with it. There's only a couple of moving parts inside, and the unit was made by the Santa Maria Bilge Pump & Suction Corporation. It's not very fancy but it *is* reliable, it balances comfortably in the mouth, it doesn't freeze up in icy water or annoy my ears by filling them with bubbles all the time, nor do my own exhalations get in the way of vision when I'm trying to take underwater pictures. Most of all, however, it's SIMPLE, and to me simplicity of equipment plus a trained self-reliance on the part of the diver are the very essence of safe, relaxed diving."

The pig snuffled indignantly and ground his cigarette out on the new pea-green paintwork. Again the owl winced.

By this time they had arrived at the reef, so the pig dropped anchor and the boat rose and fell on four-foot waves. The pig and the pussycat fussed and fumbled over their equipment, wrestling with hoses, fittings, attachment rings, chromed connectors and associated plumbing. It looked as if they were trying to assemble grotesque bagpipes. The owl, already dressed, was sitting on the rail and waiting for the others who still battled with their sophisticated gadgetry, all of which seemed to be fighting back.

Finally they were ready. The pussycat gathered the last of her stray tubes and connectors and plugged herself in like a telephone switchboard. The pig pressed a button and his Unitized Dunkpak inflated with a loud hiss, consuming several cubic feet of air in the process. It sat bloatedly on the deck, looking like some grossly obscene stomach that had just escaped from an antacid TV commercial. With a cry of, "OK, let's go!" the pig heaved the blimplike mass over the side, donned

his mask and fins and jumped overboard after it.

The Unitized Dunkpak floated majestically, waving its appendages from the top of a wave while the pig wallowed in the trough beneath, as pigs are wont to do. Then, as their positions were reversed, the pig rose on the next wave where he collided violently with his Dunkpak which was now on it's way down. It struck him on the snout in passing and the pig squealed with pain. Again and again the pig tried to struggle into his harness, but the Dunkpak eluded him, dancing on the waves and slapping at him with its flying tubes and gauges. Winds and slight surface current bore the thrashing pig slowly along, and by the time he eventually managed to subdue his Dunkpak and get everything together, he was far from the boat and quite out of breath. He tried to snorkel back on the surface, but the sheer bulk of his Dunkpak plus the slapping of waves and his basically inefficient fin action prevented any progress. He decided to try underwater, so activating the appropriate valves among the plumbing, he vented air from his contrivance and sank beneath the waves. As he angled down, the lead ballast inside the Dunkpak trundled the length of its container with a rumble like balls in a bowling alley. His console informed him that he was rapidly running out of air, the water temperature was 82 degrees Fahrenheit, his depth was twenty feet, his heading was somewhere between north and south with a touch of east and west, and it was 3 AM the day before yesterday in Tokyo. The deflated mass of materials made an excellent drogue as it flopped flaccidly up and down above the toiling pig, giving him the appearance of a rutting manta ray. His frenzied kickings were getting him nowhere and very soon he flapped himself into a state of complete exhaustion. With the last squirt of air he inflated his Dunkpak which bore him far too rapidly to the surface.

"Bully for Rigor Mortis Divers! Their Dunkpak has saved my bacon! I'll just float around until I'm rescued," thought the pig triumphantly. His relief was short lived, however, for he found himself immediately faced down among the waves. Desperately the panicking pig kicked himself upright and saw to his horror that he was farther from the boat than ever. At that moment another wave slapped the Dunkpak and the unfortunate porker was on his snout again. Gagging and retching he once more righted himself. In the quiet waters of lake, quarry or swimming pool, his cumbersome apparatus would indeed hold him upright just as the advertisements claimed, but in a choppy ocean the pooped pig was in trouble. Because all buoyancy was located entirely on his back, a certain amount of work was needed to keep right side up and no matter what the hapless pig tried, waves insisted upon inverting him as he kicked and struggled among his now useless clutter of tubes, bladder, gauges and push buttons. He considered abandoning his beloved Dunkpak altogether and trying to snorkel back to the boat but realized he'd never make it in his totally exhausted condition. As each wave tipped him over, the pig's efforts

to right himself grew more and more feeble until at last he succumbed. In his final moments, the laws of Messrs. Boyle, Dalton and Henry flashed before his eyes, as did a complete set of decompression tables, but these were of no consolation to the stricken pig who had from the outset neglected to teach himself or his pupils the very basics of a good snorkeling ability with a smooth, efficient fin action, or to insist on adequate practical training with a dependence on SELF rather than on mechanical "assistance." The pig was never seen again.

Meanwhile, the owl and the pussycat were exploring the wonders of the reef. The cat's enjoyment, however,

was marred by her preoccupation with the festoons of dangling things which emanated from her Cadaver-float compensator. Her paws flitted nervously from one gadget to another, checking and inspecting her tank pressure gauge every few seconds.

The owl tucked his wings snugly behind his tank and, thus streamlined, sank gently into the depths. A casual stroke of his fins overcame the slight current, and a full inhalation at the end of his descent wafted him to a standstill. The drag from his completely deflated safety vest was minimal and his weightbelt held him nicely in suspension at all levels. With a gentle sweep of fins and the use of breath control, the fully

About The Author Of The Pig, The Owl And The Pussycat

Until his retirement in 1981, the author of this fable, Nigel Froome spent 23 years as the resident diving instructor at the Grand Bahama Hotel on the Island of Grand Bahama. Though the thesis of his fable is self-evident, a bit about Froome himself, in his own words, seems appropriate:

"In 1935 while at school in Guernsey, Channel Islands, Great Britain, a small group of us enjoyed our first hilarious and somewhat suffocating descents with a homemade diving helmet. It was made of wood, ballasted with scrap iron, had a glass window and was fed a reluctant trickle of air via a well-perforated garden hose, an old tyre pump salvaged from the garbage dump of a local garage, and by a lethargic operator. This was undoubtedly the seed from which grew my mania for diving. I drooled over Guy Gilpatrick's book, *The Compleat Goggler*, which was published about then.

"Back in Guernsey, after returning from Germany in WW2, I began diving professionally for a one-man trawling and salvage operation. It was strictly on a drown-as-you-learn basis. My equipment was again homemade and consisted of a Rube Goldberg combination of converted British Army gas mask, 300 feet of Woolworth's garden hose (on special sale at 3 cents a foot), an old pneumatic tool compressor driven by a geriatric car engine and, for transportation, a very leaky ex-ship's lifeboat, also propelled slowly and spasmodically by the same engine. The unreliability of this ensemble necessitated frequent emergency free ascents, some from within the bowels of wrecks and some from well over 100 feet. All these antics were to stand me in good stead and without doubt saved my bacon many times over on future occasions when a customer would get his knickers in a knot over some trivial matter (or sometimes over nothing at all) and would refuse to relinquish my mouthpiece on the way up. (Octopus rigs were not invented then).

"In the early 50's, sport diving in Europe began to boom and I slowly got out of salvage work in favour of instructing as soon as the Cousteau lung became available. In addition to putting about with homemade closed circuit oxygen re-breathing units (old bus innertube, tin can of soda-lime, oxygen bottle from a crashed German plane, and sundry bits and pieces which worked quite well in shallow water, but tasted like freshly squeezed armpits), I did some scuba instruction in the Mediterranean and explored some Greek and Roman galleys that had gone down over two thousands years ago.

"In recent years, my partner Shelby Tostevin and I have become very alarmed indeed at the poor quality of training that many certified divers seem to possess. We are both somewhat fanatical about the need to teach *self-reliance* as the basic foundation upon which to proceed with the training, and we are concerned by today's training methods which appear to stress altogether too much reliance on sophisticated gadgets (that frequently malfunction) and not enough on self. An underwater Christmas tree does not a relaxed diver make, and we are constantly appalled by the inept flappings of so many of our over-cluttered divers, a lot of whom have to be rescued. Thus it was as far back as 1964, after some particularly horrific experiences with a large diving club that we refused to accept any more large groups. Since then we have only taken out small groups, a maximum of four at a time, and dive with them personally. This makes for a relaxed, leisurely and safer trip, so popular that much of our business is from repeat and regular customers. Thus have we managed to keep a perfect safety record all these years.

"Our strict operating procedures may have aroused the ire of some gung-ho groups in search of special discount "cattle boat" type trips, but if one life has been saved in the process, then it's been well worth it."

relaxed owl soared effortlessly over coral heads and glided in slow motion into canyons where he gazed enraptured at the beauty around him.

The pussycat marveled at the ease with which the owl maneuvered himself and tried to emulate him. She fumbled with her plumbing and finally, after much trial and error, managed to attain some semblance of neutral buoyancy. By alternately adding and venting air, the pussycat laboriously roller-coastered her way like an animated pogo stick behind the effortlessly gliding owl.

Then, with her Gagmaster's faulty pressure gauge still indicating 1,000 lbs., the can ran out of air. She pulled her reserve, but nothing much happened. Panic! Her eyes bulged like an organ with its stops out, and with a yowl of terror into her two-way-stretch mouthpiece she beat her way frenziedly to the surface. Once there she pummeled madly at the Cadaverfloat's inflator button, but her tank was so empty that barely a belch emerged and the enormous flotation bag remained depressingly limp. She was far too puffed and panic-stricken to blow manually into it so she tried to snorkel, but her training hadn't included this activity while burdened with an empty tank, and her fin action was therefore too weak and uncoordinated to propel her. Waves slopped into her snorkel and the cat spluttered and choked. Her Cadaverfloat was now useless and the petrified pussy tried to jettison it, even though she knew she'd never be capable of snorkeling back to the boat anyway. More waves engulfed her and, like the pig, the diving laws and theories jammed into her in the classroom at the expense of practical time in the water passed before her eyes but were no help at all to the drowning pussycat, now *in extremis*.

Then the owl was beside her, supporting and towing her bodily with smooth, powerful sweeps of his fins back to the boat. Once again the pussycat's eyes became wide with adoration, only this time the owl was the recipient of her admiration.

"O you wonderful owl," she purred, "you've saved my life! How can I ever thank you?"

When the cat had recovered from her fright, the owl explained all about the dangers of a training system that stresses dependence on equipment instead of self. Quoth the owl, "Neither you nor the pig would have

had any trouble at all if only you'd been taught how to use your fins and snorkel properly in the first place. For pure sightseeing dives in warm, clear water you don't need all that fancy, sophisticated gear which holds you back and makes you work harder just to drag its sheer bulk through the water. . .and some of this equipment is actually dangerous!" He thought of the pig's devilish device and shuddered.

"But my instructor was very strict and he made us do everything," said the pussycat.

"Did he make you snorkel half a mile on the surface while wearing your tank, regulator and weightbelt, without stopping to rest or to inflate your vest?" asked the owl.

"No of course not!" replied the cat, "and I don't think any certification course requires such a feat."

"Well it should!" said the owl emphatically. "Every diver, before getting a C card, should be required to snorkel that half mile in his own time, at his own pace, without pausing to rest and while wearing complete SCUBA equipment. It could be done in lake, quarry or in circuits of a pool. . .anywhere! This would build up a style, stamina and, above all, a self-confidence that would always remain with that diver and enable him to face almost any situation he or she is likely to meet anywhere. So what if your gauge floods or sticks like yours did? It's quite common. What if you have a mechanical problem? Small ones happen all the time. If you *know* you can handle yourself, no matter what, you are then a completely relaxed and safe diver, so thoroughly at ease that you can revel in each dive without any nagging apprehensions about your equipment. A poorly trained athlete merely loses his event, but a poorly trained and overcluttered diver may lose everything!"

"You are such a wise and elegant fowl. . .would you be willing to teach *me* how to dive safely and gain self-confidence?" pleaded the cat.

The owl looked up to the stars above, and sang to a small guitar, "O lovely Pussy! O Pussy, my love, what a beautiful Pussy you are. . .I shall be delighted!"

And this is really why the owl and the pussycat went to sea in a beautiful pea-green boat. . .and how Mr. Edward Lear got the idea for his famous poem in the first place.

Why Divers Die: Part I

—An Analysis From The University Of Rhode Island

Each year the National Underwater Accident Data Center at the University of Rhode Island, under the authorship of John J. McAniff, publishes a compilation of diving fatality statistics. From that report, we condense annually the material we find most relevant to our readership, then publish select cases detailing the cause of fatal accidents.

In most cases the death of a diver is clearly preventable. By carefully reading these cases—and retaining the lesson explicit in each—sport divers, we hope, will help themselves to continue diving without accidents.

* * * * *

In 1979, there was a 10.7% increase in non-

occupational underwater diving fatalities compared to 1978. The 130 fatalities during 1979 is still dramatically lower than the peak year of 1976, when 147 fatalities were recorded. This is encouraging, since the national training agencies have been reporting a slight increase in numbers of divers trained in each of the past three years.

The state of Florida, which has persistently reported the largest number of fatalities of any state in the country (except in 1979) is showing constant decline in deaths, from a peak in 1974 of 42 fatalities to the 1978 figure of 26 fatalities. California, which presented a peak year in 1979 with 36 fatalities, reported 28 deaths in 1979 and exceeded Florida for the first time. Unfortunately, the state of Washington almost tripled the 1978 figure of 6 fatalities, reporting 17 for 1979.

Cave Diving

The incident of cave-diving fatalities is once again lower than might have been expected considering the peak year 1974 in which 25 divers lost their lives in caves. By contrast, the past three years (1977 with 7 fatalities, 1978 with 13 fatalities, and 1979 with 12 fatalities) are all considerably lower. Of the 12 cave-diving fatalities in 1979, four, or one-third of the total, occurred outside the state of Florida. One of these incidents occurred in an area known as Blue Hole Lake in Santa Rosa, New Mexico, and claimed two lives. The other incident occurred at Jacob's Well in Texas and was also a double fatality. The total of eight cave-diving fatalities for the state of Florida is only one more than the best year on record, 1977, in which Florida had only seven cave-diving deaths. The double fatality at Santa Rosa, New Mexico, involved two young divers with less than 15 hours of experience each. It was reported after the fact that the regulators used by the two victims were severely out of adjustment and breathed very hard.

The double fatality at Jacob's Well in Texas apparently was complicated by silt and boulders, which partially trapped the two men. Adding to this tragedy, the lead diver in a recovery team also became trapped at approximately 100 feet, and in his efforts to get loose from the boulders and silt, he apparently swallowed sufficient air to rupture his abdomen. This was the first of this kind of injury ever recorded by the NUADC and was nearly fatal.

Diver Depth

Once again in 1979 the NUADC noted that more than 50% of nonoccupational underwater diving fatalities occurred in shallow water; that is, the 50% point of such cases occurred in water shallower than 55 feet for 1979. Most authorities recognize a depth of 100

feet for safe scuba diving, and all agencies, including the U.S. Navy, suggest an absolute maximum safe diving depth of 130 feet. A review of the 1979 NUADC files reveals only one case in excess of the 130-foot safe diving limit. This fatality occurred in Lake Superior on a wreck dive to 225 feet. This dive by two very experienced men was calculated for 15 minutes at a maximum depth of 230 feet. All decompression stops were laid out in advance, and the plan went well until the victim's buddy diver encountered free-flow of his primary regulator, which functioned correctly, but the free-flow depleted the air very fast. The buddy diver asked the victim to turn off the primary free-flow, but apparently the victim didn't understand and ignored him. With the free-flow still in progress, the buddy started an emergency ascent by inflating his suit at depth. Upon reaching the surface, he immediately went back down for his staged decompression. Upon completion of decompression, about 40 minutes later, he learned that the victim had not surfaced. Extensive efforts were made to locate the body, but it was not recovered until ten days later. The medical examiner's opinion as to cause of death was asphyxiation in fresh water due to nitrogen narcosis at depth and running out of air.

Weather

During 1979, the NUADC recorded 22 cases in which conditions indicated wave heights of two feet or less. It is unlikely that such conditions are a serious inhibition to scuba diving.

"The trouble began at a depth of 100 feet, where the rubber mouthpiece of the victim's regulator supposedly fell off. Despite the victim's 12 years of experience, the attempt at buddy-breathing was a failure."

Six additional cases were recorded which indicated a wave height of over two feet. In one of these cases the trouble began at a depth of 100 feet, where the rubber mouthpiece of the victim's regulator supposedly fell off. Despite the victim's 12 years of experience, the attempt at buddy-breathing was a failure. The divers had been engaged in what is locally known as "drift diving," in which the float to the surface is followed by the tending boat. In this instance, the float was attached to the victim, and its line was used to pull him to the surface. The death was attributed to a massive air embolism.

In the second case in which wave heights of more than two feet were noted, there is also little probability that wave height was a factor. A 56-year-old man became separated from his son, with whom he had been buddy diving. He was found floating on the sur-

face, with his buoyancy compensator partially inflated, but unconscious. The cause of death was recorded as a massive air embolism. The dive had been at approximately 20 feet and for a period of approximately one hour.

In still another 1979 case, the victim surfaced amidst kelp and approximately three-foot-high waves and, apparently, a strong surge. The buddy reports that upon surfacing the victim simply slipped back and became entangled in the kelp without any apparent panic or thrashing.

This case typifies a situation seen more frequently in recent years by NUADC, which they have named the "sudden drowning syndrome." In such cases, the divers have typically been diving for quite some time in cold water, and upon returning to the surface find themselves in rougher conditions than they expected. It may be that the mammalian diving reflex in which there is a slowdown of heart rate as the result of cold-water immersion of the face leads to a cardiac arrhythmia, which could result in immediate drowning with no display of thrashing or panic. In all such instances we cannot overlook the possibility of an air embolism.

A combination of factors appears to have contributed to still another fatality in 1979. A class and their instructor were to make a 50-foot dive, and it was the victim's first ocean instructional dive after pool work. Sea conditions were such that other instructors had canceled dives for the day. The entry had been very difficult due to high surf conditions. When the student was discovered missing, the entire class surfaced and carried out a search for approximately five minutes; however, the victim's body was not recovered until the following day. Though the class was making a 50-foot deep dive, the victim had no depth gauge, no air pressure gauge, no watch, and no compass. There had apparently been no dive plan laid out in advance, nor a pre-dive buddy check of the equipment. Apparently, because of the rough conditions, there was also no surface float employed. It was later learned that the victim had noted to friends in the class that his regulator had been free-flowing in the last pool dive. To further complicate matters, this victim weighed approximately 130 pounds but carried 26 pounds of weight, seemingly far in excess of what would be necessary for neutral buoyancy. When the victim was recovered the following day, recovery divers attempted to use the victim's regulator at the 50-foot depth at which he was recovered and were unable to make it function. It would appear that this trainee had many things going against him besides poor weather conditions on this day.

Since the above scenario is repeated at least one or two times each year in training programs, the NUADC feels it is important to stress that an instructor should cancel his dive if weather conditions are severe.

The NUADC recorded a total of eight fatalities which involved heavy or dangerous surf. Five of these cases occurred off the California coast, one off the Oregon coast, and the remaining two in Hawaii. The rough surf conditions mentioned in each of these cases ranged in wave height from low of four feet to approx-

"The fifth California case involved severe head injuries when the diver was apparently thrown against the side of the boat by high waves."

imately 20 feet. In all of these instances, it appears that conditions were far from conducive for scuba diving. Three of the five California cases involved very high surf and head injuries leading to drowning. A fourth California case was a night dive also involving high surf. The fifth California case involved severe head injuries when the diver was apparently thrown against the side of the boat by high waves. One of the Hawaii fatalities and the Oregon fatality involved extremely high surf and surge against rocky cliffs. The second Hawaii case occurred when two divers attempted to enter a semi-submerged cave in a rock lava wall and the victim became trapped on a small cliff that was being pounded by the surge.

The presence of a strong current was reported in still another case during 1979; however, it is the NUADC opinion that the current played no part in this particular instance, which turned out to be one of the strangest cases in the history of this research effort. The fatality was attributed to apparent "experimental" suicide. An 18-year-old male, whose home state was California, traveled to Florida, rented diving gear and a boat with an operator, proceeded to dive alone, and disappeared; his body was recovered four days later. Upon examination by the medical examiner, the victim was found to have a bullet hole in the right side of his head, and the bullet itself was found inside the skull. Further investigation revealed that the victim allegedly was mentally disturbed, and on the day of the dive he carried with him into the water a small red plastic bag. He reportedly told the boat operator, "Let me have that red plastic bag. I want to try an experiment." Though the gun was never recovered, extensive investigation led to the belief that the young man dove underwater with the gun still in the plastic container, placed it to his head, and fired.

Current apparently played an important part in a fatality off the San Juan Islands in the state of Washington during 1979. In this particular incident, a young female diver completed a dive of 20 to 25 minutes at 40 feet with her buddy after they had become separated from the second buddy pair. Both

she and the buddy attempted to use the auto-inflator of her buoyancy compensator, but it would not work. They then inflated the BCs orally and proceeded to the surface with no apparent difficulty. Upon reaching the surface, the current caused them to begin to drift apart. The female victim apparently became panicked, dropped out her mouthpiece, and failed to continue to inflate her BC. The buddy's attempt to do so, or to drop her weight belt, was ineffective because of the constant fighting and thrashing on the part of the victim. When the victim began drifting to the bottom, the buddy, who had dropped the weight factor from his buoyancy compensator, could not submerge and attempt to retrieve her. The victim's body was recovered three hours later by a police diver.

During 1979, the NUADC recorded a double fatality in the same San Juan Islands area. Information from the accident report cites a very strong tidal current, though it is not clear whether this contributed to the accident. The two victims had been diving on a wreck in approximately 135 feet of water. Their actual depth upon recovery was inside the wreck superstructure at a depth of about 75 feet. Both of the victims were apparently well-equipped, including depth gauge, submersible pressure gauge, compass, decompression meter, bottom time gauge, and knife. Examination of the gear after the fact showed a number of discrepancies that may or may not have contributed to the accident. Neither of the victims had pull rods for the J-type reserve. One of these reserves had been activated, the

other had not. It was also noted that the buoyancy compensator of one of the victims had been "slashed." There is of course no way of knowing whether or not the slashing of the BC occurred during, before, or after the fatal accident. It was also noted that both divers carried spare demand second-stage regulators and that one of these showed a regulator exhaust port dented and the exhaust valve cover slightly displaced.

Diving under the cover of ice produced three fatalities during 1979. One incident occurred in a Midwest state in a large reservoir or lake, and resulted in a double fatality. The first victim was a certified scuba-diving instructor and his associate was a freelance photographer, but no indication is given of his level of scuba experience. Both victims apparently went under the ice without tending lines and without any kind of tenders. They were found about four hours later, both with quite sufficient air in the tanks. One of the victims had lost his knife, apparently in an effort to chop through the ice. Once again, with no survivors, it is nearly impossible to determine what caused the accident.

An encouraging note concerning charter boat activity is that although the charter boat fleet has increased in nearly every area of the country, the numbers of fatalities have gone down consistently since 1976. This decrease probably reflects the increased recognition by charter boat operators of their responsibilities and legal liabilities. *(Continued, next issue.)*

U.S. Navy Commercial Depth Gauge Tests

—Most Gauges Show Respectable Performance

The United States Navy Experimental Diving Unit in Panama City, Florida, provides the only independent and systematic testing of diving gear in this country. In June, under the leadership of Test and Evaluation Engineer James R. Middleton, the Navy published its findings on 28 wrist-worn depth gauges available commercially to sport scuba divers. Nearly all of the gauges tested performed reasonably well at the three temperatures tested (32°F, 70°F and 90°F) and at depths up to 200 feet of sea water (FSW).

We are providing an edited version of their findings, along with a chart showing the range of error of the 28 models tested. The U.S. Navy set no standards for pass or fail, leaving interpretation up to the reader. In the next issue we will provide more specific readings on selected gauges and indicate those gauges which we believe should not be used by sport divers.

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During January and February 1981, the Navy Experimental Diving Unit (NEDU) tested 28 commercial-

ly available, diver wrist-worn depth gauges. Unmanned tests were performed to determine accuracy, repeatability, watertight integrity, thermal stability, durability, readability and luminescence capability on all depth gauges.

These tests did not include cycle life testing or the length of time a gauge may be expected to remain in calibration during normal use. Since Navy use of diver wrist-worn depth gauges requires frequent calibration checks, these evaluations were not deemed necessary.

Capillary depth gauges were not evaluated since there is no internal pressure sensing mechanism involved, and their accuracy is implicit in the design. The only limiting factor in a capillary gauge is that since it follows Boyle's Law, the gradations on the face of the gauge get very close together at depths beyond 60 FSW which effects readability.

Accuracy and Repeatability Tests

Two of each gauge model were compressed in an

ambient temperature water bath (approximately 70 °F) to its maximum working depth in a hyperbaric chamber. The water bath just covered the top of the gauges and was used to check for leaks. Accuracy readings were taken in 10 FSW increments on descent and ascent. Gauge readings were compared to a digital ASHCROFT O-200 psig Digigauge ($\pm 0.05\%$ accuracy). A total of three compression/decompression scenarios were recorded on each gauge to determine repeatability.

Since the purpose of these tests was to evaluate the performance of new, previously unused gauges, cycle life testing consisting of numerous compressions to maximum depth was not conducted. Two gauges of each model were tested only during the accuracy and repeatability tests. Therefore, one of each model was subjected to all phases of testing, while the other was tested only for accuracy and repeatability in 70 °F water. This was done to give an indication of the quality control available in each model.

The vast majority of gauges tested were accurate within ± 5 to ± 10 FSW under most test conditions. Data showed the majority of gauges to be slightly more accurate during descent than ascent. Accuracy on most gauges was best at 70 °F.

One gauge was off by as much as 20 FSW. Since only two of each model gauge were tested it was not known whether performance of this gauge was indicative of this particular brand. However, this gauge was identical internally to several other brands which were off by only 2 to 5 FSW at 32 °F. This highlights the difficulty in calibrating on a mass-produced basis small, wide-range depth gauges with current state-of-the-art techniques. These large variations, however, occurred for the most part in 32 °F water, an extreme condition where conservative diving practices are already in order.

Most gauges possessed a constant degree of error, i.e., they varied from true depth by a relatively constant number of FSW. However, all gauges did read zero when on the surface.

Most gauges had much better accuracy at depths of 130 FSW and shallower. Most gauges at 70 °F were within ± 5 FSW accuracy to a depth of 130 FSW. Deeper than 130 FSW, accuracy diminished to between ± 5 FSW and ± 10 FSW for most models. This is important since 0 to 130 FSW is the depth range for the vast majority of SCUBA divers.

Watertight Integrity Tests

Each gauge was pressurized underwater a total of 14 times, including 2 open-water dives. All gauges tested maintained 100% watertight integrity throughout the evaluation.

Thermal Stability Tests

All models were evaluated in 32 ° and 90 °F water,

respectively, in comparison to the 70 ° tests, to determine the effects of temperature. At 32 °F, there was a distinct trend observed where the majority of the gauges read shallower than they did at 70 °F. Some varied by only 1 to 3 FSW, but several gauges read as much as 10 to 15 FSW shallower at 32 °F than measured at 70 °F. In most cases however, the shift was not significant.

In 90 °F water, the trend was reversed, but to a lesser degree. Most gauges gained 1 to 3 FSW over the 70 °F reading, but no major accuracy changes were noted as was the case in 32 °F water.

Durability Tests

One of each model was dropped from a height of three feet onto a concrete floor with the dial face up and then placed in a hyperbaric chamber for an accuracy test consisting of a single compression to its maximum operating depth while immersed in 70 °F water. Accuracy was recorded during descent and ascent in 10 FSW increments to determine if changes in accuracy had been caused by impact. The test was designed to simulate the type of blow a depth gauge might receive while being moved from place to place in a diver's gear bag or if accidentally dropped.

All of the gauges passed the durability tests with minimal variations in accuracy and repeatability as compared to the 70 °F tests.

Durability testing also consisted of inspecting each gauge for corrosion following salt water immersion. No corrosion problems were observed with any gauge after salt water immersion as long as they were washed thoroughly in fresh water following each dive.

Readability/Luminescence Tests

A test platform was constructed on which one of each gauge model was mounted. Following mounting, the gauge board was taken 60 FSW in the Gulf of Mexico. A minimum of eight Navy-qualified divers judged readability of all gauge models at depth on day and night dives. On night dives, readability was determined by each gauge's own luminescence after it had been activated by an incandescent, hand-held underwater light. The time of activation for the depth gauges was predetermined in a darkened lab by subjecting the gauges to different periods of direct incandescent light. A nominal time of 15 seconds was chosen to best satisfy overall luminous activation of the depth gauges. In order to standardize the readability testing, each diver's vision was required to be 20/20 or corrected to 20/20 by appropriate means. The distance from which the mounted depth gauges were read underwater was left to the diver's discretion.

All of the gauges tested were found to be adequately readable, i.e., ease of determining the actual depth reading from the dial face. In addition, all models which were advertised as being luminescent were, in

fact, highly readable under low-light conditions after activation by an incandescent light source such as a diver's hand-held light. The gauges remained highly luminescent for approximately 5 minutes after activation. The only gauges tested which were not designed for luminescence were the DACOR SFG 150 and SFG 300.

Discussion

Since 1965, depth gauges have been evaluated for accuracy according to a military specification developed to build, under contract, an extremely accurate, non-magnetic depth gauge specifically for use by U.S. Navy

U.S. Navy Depth Gauge Test Results

	DURABILITY TEST							
	32°F		70°F		90°F		70°F	
	0-50 FSW	51-200 FSW	0-50 FSW	51-200 FSW	0-50 FSW	51-200 FSW	0-50 FSW	51-200 FSW
DACOR SFG 150	1/2	1/5	2/4	2/10	3/5	5/11	2/3	2/10
DACOR LFG 150	3/5	3/7	4/5	5/10	4/6	5/11	7/9	7/12
DACOR SFG 300	0/1	0/4	0/2	10/-2	0/1	0/10	0/2	0/10
DACOR LFG 300	2/6	2/10	5/7	5/14	3/7	3/15	3/7	3/15
FARRALLON								
04-1610	-1/-4	-3/-5	2/5	2/5	2/3	2/3	0/1	1/-1
FARRALLON								
04-1630	6/8	1/5	0/2	0/-5	0/2	2/-5	1/3	0/3
FARRALLON								
04-1620	0/5	1/6	1/7	4/7	1/5	2/7	5/-2	3/8
PARKWAYS								
801900	1/2	1/3	1/4	2/4	0/2	1/4	0/0	0/7
PRINCETON								
TECHTONICS DG-10	2/5	0/-8	1/5	8/-10	2/-1	6/-7	1/4	4/-7
SCUBAPRO								
28-849	-1/-3	-2/-5	1/-1	0/5	1/-1	0/2	0/2	14/-8
SCUBAPRO								
28-850	-1/1	0/2	2/-2	5/-2	0/3	3/7	1/-1	1/5
SCUBAPRO								
28-503	1/6	1/-10	0/5	5/-10	5/-1	5/-5	2/5	5/-10
SCUBAPRO								
28-012	0/-3	0/-8	0/2	6/-2	0/3	0/8	0/2	5/-1
SCUBAPRO								
28-507	0/-5	0/-10	1/4	3/-13	0/1	1/-10	0/2	0/-10
SEAPRO DM-250	-10/-20	-10/-20	2/-1	2/-6	1/6	0/7	1/-10	1/-7
SEAQUEST 8010	1/4	+4/-5	5/-5	9/-2	1/5	6/-2	0/4	5/-1
SEAQUEST 8012	0/0	0/5	1/3	3/-5	7/-7	0/8	0/2	4/-2
SHERWOOD								
DG350	1/3	0/5	1/5	5/10	1/8	4/9	0/6	2/8
SPORTSWAY								
1406	1/2	1/4	-1/-5	0/-11	0/2	0/4	1/3	0/3
SAS 2069	0/-3	0/-3	0/2	2/4	0/3	1/4	2/-1	0/4
SAS 2069	1/5	0/5	1/-2	1/-5	0/-4	1/-4	2/-1	4/-4
TEKNA T-2600	0/2	0/9	0/3	7/-4	0/-3	5/-3	0/2	6/-3
U.S. DIVERS								
7044	1/2	0/2	2/2	0/2	1/2	0/2	1/2	0/2
U.S. DIVERS								
7042	0/1	1/-4	0/2	2/-3	1/2	3/-1	0/1	1/-4
U.S. DIVERS								
7043	-1/20	2/-2	2/-1	1/8	2/-1	2/5	0/1	0/4
U.S. DIVERS								
7045	0/1	3/-3	0/2	1/5	0/1	2/5	0/2	1/3
WHITE STAG								
51246	-5/-5	-4/-7	1/-1	1/-1	1/1	0/1	0/-1	0/0
WHITE STAG								
51247	-9/-10	-3/-15	0/-7	0/-7	2/-2	2/-5	-1/-10	6/-8

Range of Error (Feet of Sea Water) of Tested Gauges:

The numbers in the boxes beside each model represent the *minimum* and *maximum* deviations in feet from true depth. For example, the last gauge in the chart, the White Stag 51427 at 32°F and between 0 and 50 FSW always indicated a depth at least 9 FSW shallower than true depth and had a maximum deviation from true depth of 10 FSW.

Explosive Ordnance Disposal Divers. This Spec called for a gauge accuracy of ± 1 FSW between 0 and 50 FSW and ± 3 FSW between 50 and 200 FSW. This cannot be met by mass-produced, commercial depth gauges in price ranges generally considered affordable. Consequently, the gauges evaluated in this report are not compared to these specifications.

"The majority of the gauges tested read deeper than true depth under all test conditions."

The majority of the gauges tested read deeper than true depth under all test conditions. This is an obvious safety advantage to the diver from a decompression standpoint, but cannot be assumed carte blanc, since some models read shallower than true depth.

All models use a very similar mechanism for sensing pressure. Many gauges, marketed by different companies, are exactly the same gauge with different dial faces and commercial logos. This becomes significant when two models with the same internal mechanisms read ± 10 FSW different under identical test conditions. This makes it difficult to state categorically that one model is superior to another when, in fact, they may be exactly the same gauge.

In addition, test results showed repeatability of all gauges tested to be excellent (i.e. identical test conditions yielded nearly identical results on the same gauge after multiple compression/decompression scenarios). Consequently, any of the gauges tested may be used safely after comparing them to a known standard. This standard may be a calibration check in a hyperbaric chamber, use of a descent line marked in 10 FSW increments or comparing the gauge against known sea floor depths.

A 0 to 150 FSW depth gauge is commonly believed to be more accurate than a 0 to 300 FSW depth gauge in the 0 to 150 FSW range. The data in this report do not support this belief. While there is a definite trend in all gauges tested to become somewhat less accurate as depth increases, the deeper indicating gauges are normally as accurate as the shallower indicating gauges at corresponding depths.

Durability testing showed the rubber covers which protected all models against impact to be effective as long as the gauges were dropped in the dial face up position. This is significant since any blow to the side of a gauge is likely to cause the gears in the mechanism to jump and ruin its calibration permanently. Any depth gauge should have a calibration check when it has been subject to an unusual shock or if performance is suspect for any reason. Depth gauges, either military or commercial, are delicate instruments and cannot be expected to maintain any degree of accuracy if not treated as such.

Gauges were tested to a maximum depth of 300 FSW

even though several models indicated depths substantially deeper, well beyond realistic safe limits with open-circuit SCUBA. The U.S. Navy Diving Manual limits open-circuit SCUBA dives to 130 FSW. No discernable difference was observed between types of sensing mechanisms, i.e., bourdon tube, diaphragm, or a combination of the two. However, two models, the Tekna T-2600 and the Princeton Techtonics DG-10 had a zero-adjustment mechanism, which allows the gauge to be re-zeroed at altitude or specifically calibrated for a given depth. These features, while not affecting the overall accuracy as tested by NEDU, may be useful in special situations. However, important to note is that this re-zeroing capability does not correct these gauges for changes in decompression calculations considered inherent in altitude diving.

The Farallon 04-1630 has a maximum depth indication feature which automatically records the maximum depth reached on a given dive. This could prove effective and become quite useful in a multi-depth dive scenario.

Several gauges had expanded scales at the shallower depths. While this feature definitely enhances readability, these gauges were found to be no more accurate than the other models tested.

Conclusion

The overall conclusions are as follows:

- ★ Accuracy of the vast majority of gauges tested was ± 5 FSW from 0 to 50 FSW and ± 10 FSW from 51 to 130 FSW under all test conditions.

- ★ While accuracy of identical depth gauges may vary from unit to unit, repeatability of all models tested is essentially the same.

- ★ Accuracy of current diver wrist-worn depth gauges is reasonable considering the state-of-the art in manufacturing techniques and the unit price increase which would occur if a higher accuracy were required.

- ★ A custom calibration, i.e., a comparison of the depth gauge against a known standard on each individual gauge, should be performed by the user (including new gauges). This known standard may include hyperbaric chamber testing, a descent line marked in 10 FSW increments or by comparing the gauge against various known depth areas of the sea floor. The diver should then dive by his calibration sheet rather than the actual reading on the gauge.

- ★ Gauges should be checked for accuracy at least once every six months, or any time the calibration is in question.

- ★ The fact that a depth gauge is reading zero on the surface and is correct at a known depth does not necessarily mean that its calibration is still intact over its entire depth range.

- ★ Commercially produced diver depth gauges are considered sufficiently accurate and durable for U.S. Navy use as long as the limitations outlined herein are recognized and the diver responds accordingly.