

undercurrent

The Private, Exclusive Guide for Serious Divers

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Jardines de la Reina, Cuba

is it the marine paradise Anderson Cooper claims it to be?

IN THIS ISSUE:

- Jardines de la Reina, Cuba.....1
- Send Us Your Reader Reports
for the Chapbook.....3
- Raja Ampat Dive Lodge5
- Improving Rebreather Safety:
Part II9
- Is a Caribbean Cruise for
Serious Divers?10
- The Mouthpiece Retainer11
- Rebreather Resources.....12
- More Etiquette from the
Scuba Snobs.....13
- Anatomy of a Dive Death
Investigation14
- One Cavern Plus Panic Equals
Four Dive Deaths.....16
- Books to Make You Smarter
Divers.....17
- What a First Dive for This
13-Year-Old.....19
- Flotsam & Jetsam20

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Dear Fellow Diver:

It was expected to be a dark and stormy night. I awoke to the whistle of wind and a persistent tapping like drops from a rainspout. It was my fourth morning aboard the Tortuga, my Cuban floating hotel, in early March, and El Norte had arrived.

Four days before, I had left Havana at 5 a.m. with two American couples aboard a chartered motor coach, and rode for six hours to the port of Jucaro on central Cuba's southern side. Then we had boarded a motor launch for a three-hour journey to the Tortuga, our floating base for the next six days, only to be greeted with the news that an impending storm would require us to dive three times a day instead of two, so that we could get all our allotted dives before the weather closed in.

On my first morning, I awakened well before the room-service coffee delivery to get my system booted and my gear assembled to avoid any last-minute stress. Then I joined fellow divers for a continental breakfast, including eggs and fresh bread (coffee lovers, bring a large cup). This was to be the standard, but sometimes fresh cookies or slices of cake were added. Breakfast introductions revealed one thing we divers all had in common: We were motivated to dive Jardines De La Reina (Queen's Gardens) because of Anderson Cooper's glowing 60 Minutes report on the place (see the video at www.cbsnews.com/video/watch/?id=7392092n).

We would soon take our checkout dive where he had praised the most pristine reefs in the



The Dive Deck on the *Tortuga*



Caribbean, and I was ready to find out if it lived up to my expectations.

I geared up on the uncluttered, 22' x 25' aft dive deck, where the only photographer's amenity was a dunk barrel with fresh water. There was a freshwater hose for wetsuit rinsing but no drying rack. All went well until I jammed my left foot into the sleeve of my 3mm full wetsuit. Chinese hand cuffs would have been easier to escape from. I hobbled around and finally fell into a deck chair; four fellow divers politely ignored the fiasco. I untangled myself, stepped into the skiff, and

we departed for our checkout dive. Briefed and geared up, I backrolled and descended to a 30-foot-deep flat at Anclitas. I expected the southern side of Cuba, the side that seems to attract most Florida-bound hurricanes, to show some destruction, but the exceptional water clarity, and the health of the sea grass meadows and gorgonians amazed me. It seemed as if every square inch of the reef flat was competing with its neighbor for the nutrient-rich tidal flows. Sea fans were healthy, with perfectly-formed new tip growth, not like the tattered, diseased fans of Bonaire. I followed Fausto, our dive guide, off the flat and down to a sandy level at 60 feet. The photographers studied the bottom for subjects as we moved along a sloped side hill of hard coral. Fausto positioned me so I could be the one to make the discoveries, like a five-inch channel clinging crab, an edible-sized spiny lobster backed into a tight crack, an upright green moray lurking ominously from a series of pillar corals, and a 20-inch-long tiger grouper supporting two remoras.

After I reached 900 psi, I began a slow ascent to a safety stop so I could breathe down to 500 psi and check my buoyancy. This was not to be. Our bubbles signaled Roberto, the boat driver, to drop tiny pieces of fish, attracting one, then three, then five more silky sharks that began circling the boat. The tiny scraps did not produce the melee I had seen on Mike Ball's Spoilsport when dead fish were dropped, just a continuous slow circling. For 15 minutes, they gave us almost every possible angle and pose. The silkies came close enough to touch (I did) or to observe the sun-lit muscle ridges along their sides as they undulated past. I checked my buoyancy and found I had overcompensated for my wetsuit. The consistent 79-degree water would have allowed me to use my 2mm shortie. The belt weights available were exclusively 1.1 pounds each, which made exact buoyancy and trim adjustments easy. Once up the vertical ladder, I exclaimed what a fantastic dive it was. "Just the beginning," said Fausto, "wait for the next dives." And I knew I had eight more dives before El Norte.

The skiff's gunwale perfectly matched the dive deck's height. The five of us stepped off while Roberto took our aluminum 80s and BCs to a small island to refill back to 3000 psi (air only). No noise from the compressor or the power generator ever reached our floating hotel. I walked up a stairway to the second floor and the Tortuga's seven cabins. Refurbished in 2008, the upstairs is tiled throughout and has room for 18 guests in a variety of individually controlled air-conditioned room configurations. My wood-paneled cabin, with a double bunk and single bed, had been cleaned by the two young female staffers, and my bed had been made. A large sliding glass window allowed me to sleep bug-free and without air conditioning. I had the choice of 220- or 110-volt outlets to charge my camera and strobe. My gear and clothes alone filled most of the storage space, so I can't imagine sharing the cabin with two others. In my bathroom were a porcelain commode, basin and a tiled shower with a powerful hand-held nozzle. Surface interval over, I dove again and returned for lunch.

Noel, the other dive guide, and I talked about the Tortuga's history while we ate. This 25-foot-wide, 100-foot-long wide steel hotel on a barge was built 15 years ago and intended as oil workers' living quarters. It's now run by the Italian Avalon Company and the Cuban Marlin Company, which have an exclusive license for the Jardines De La Reina protected zone, offering fishing and diving trips from the Tortuga and four other liveboards. Noel has been with this boat from the beginning, working up from laborer to divemaster, and both he and Fausto speak good English. A day later, he began guiding a group of four Canadians from a separate skiff, not crowding everyone in ours.

The lunches and dinners emphasized health and value rather than gourmet deliciousness, and used seasonal local products rather than imports. Shredded cabbage with tomato slices and vinaigrette dressing was the daily salad, and mango chunks and pineapple slices showed up three times daily. The starch choices were white rice, rice and beans, and yucca. Fresh fish lovers will love that snapper, grouper, lobster, and shellfish dominate the meals, and I was able to get red meat or chicken if I requested it.

By the third day, I learned the routine. There were no whiteboards communicating dive site names, planned depths or attractions. If I saw fish carcasses in the back of the skiff, it was going to be a shark feed. Twice as many tanks meant bring sun protection; we were going to off-gas at an island beach. Fausto, an SSI-certified divemaster with five years' experience at Jardines, followed routines I was used to: first dives were deep, with an average depth of 102 feet. This was necessary for the deep shark feeds, where a fish carcass was put into a barrel sponge and covered with several pieces of coral. Reef sharks compete with groupers, yellowtails and queen triggerfish, all circling for a chance to stick their heads into the sponge. A great opportunity for over, under, head-on or profile shark shots. Then back to the Tortuga or an island beach for the surface interval. The second dives averaged 82 feet, and could be another deep shark feed or an excursion to caverns and a surface feed for silky sharks. Yes, the emphasis of Jardines is the shark show. More than 80 percent of the dives were shark-oriented, possibly in deference to the photographers -- or because I never stepped up and asked for changes of scenery. The depth, duration and activity did not allow me to depart and follow my own profile unless it was to ascend for greater safety. On several dives, I found my aggressive computer indicating only three or four minutes out of deco. Fausto was watching and occasionally motioned me upward. (The nearest decompression chamber is six hours away in Havana).

We usually departed at 3 p.m. for the optional third dive, averaging 70 feet in depth. That was followed by happy hour on the shaded foredeck, where we watched the sunset while a friendly freshwater crocodile watched us, mint leaves were mulled into Mojitos, and multiple plates of pizza and focaccia were passed. Seven of the

We Need Your Reader Reports

You may still be browsing through our 2012 *Travelin' Divers Chapbook* (or you can get it at www.undercurrent.org/members/UCnow/chapbook2012.php), but we're already starting to gather reader reports for the 2013 edition.

To send us your reviews of dive operators, liveboards and resorts, complete the online form at www.undercurrent.org/members/UCnow/SubRRTopMA.php. You can also follow the link "File a Report" on the left side of our homepage (www.undercurrent.org); or after logging in, follow the "Reader Report" link in the top navigation bar.



Multiple Sharks on Every Dive

Jardines de la Reina, Cuba

| | |
|----------------------|-------|
| Diving (experienced) | ★★★★★ |
| Diving (beginner) | ★ |
| Snorkelling | ★ |
| Accommodations | ★★★★ |
| Food | ★★★ |
| Service and Attitude | ★★★★★ |
| Money's Worth | ★★★★★ |

★ = poor ★★★★★ = excellent
Caribbean Scale

nine divers were smokers and probably never noticed the diesel smoke floating by as we talked. Beer, non-diet soda and liters of water were \$1 each, while wine, liquor, and mixed drinks were offered for \$2.

The fourth morning arrived, but El Norte's dreaded effects never materialized. The whistle of wind I thought I heard was from my closed cabin window, the tapping of raindrops was actually early-morning maintenance work on a nearby storage barge. Castro's flag had changed directions in response to the slight breeze from El Norte, the temperature had dropped from the normal 82 to 77 degrees, but the sun was rising and the gray clouds were breaking up as three of us boarded and shoved off.

The twin 60-hp Yamahas took our narrow, 26-foot skiff through lagoons without a splash, and steeply banked around mangroves close enough to touch. I sat along the side, facing center, with my dressed BC flat on the floor at my feet. Eight divers could be carried comfortably. A small sunshade shielded only the driver and standing dive guide, so sun protection is a must.

The ride showed the unique magic of Jardines De La Reina. I was in a text-book barrier reef ecosystem 40 miles from Cuba's coast, significantly different from Bonaire's fringing reef fronting a polluted and rapidly developing coastline. The incoming tide brought very clear water and high visibility to the reef, while outbound flows from the mangroves reduced visibility, and nourished the flats backing the hard coral barriers. Approaching the open Caribbean felt like leaving a protective jade necklace of tiny green islands. After our 12-minute trip to the mooring buoy at Farallon, Fausto briefed us, Roberto handed me fins, and lifted my BC and tank, and I backrolled over 10 or 12 (no one was counting any more) waiting silky sharks. I descended to 85 feet, following Fausto through tight but sunny, open-roofed passages, and left the group to solo glide through a maze of contorted, twisting swim-throughs. We met in a box canyon and reversed our journey, then ascended to yet another surface-interval shark feed. Once aboard the skiff, I expected a quick return to base, but one of the divers had dropped his camera when exiting. We were deposited onto an island while Roberto went off to get fresh tanks, leaving with the admonishment: "If you see a three-foot iguana, well, it's not an iguana!" I walked the sand, finding pristine pieces of plastic trash deposited on the shore and washed into the island's dense foliage. The skiff returned, I boarded, we left, tied up, back rolled, found the camera and re-did the previous dive at a slower pace.

I inspected the underside of overhangs with my Sola 1200 compact light. These shadow zones, illuminated by powerful strobes or high-powered handhelds, revealed psychedelic displays of brilliant algae in shades of red, purple, pink and burgundy, with splotches of yellow thrown in, as well as leaf-hanging vine alga and strands of red and purple wire corals. But there were few small reef fish. Unlike Bonaire's variety of butterflies, angels, parrots and chromis, Jardines is infested with squadrons of plump, lazy lionfish. No removal efforts are being undertaken, and they probably would be ineffective. A guided ascent past multiple castles of fuzzy pillar coral ended my dive.

Back aboard, a diver said to me, "I notice you don't wear gloves." Fausto replied, "Gloves are prohibited in national parks, but you should wear them here so the sharks don't mistake your white hands for fish." Say what! My hands shriveled back into my wetsuit sleeves as though I'd been doused with ice water. Why wasn't I briefed?

The question was answered that evening by Antonio, Tortuga's manager. He admitted he had been taking care of a problem on one of the company's liveboards for several days, allowing his competent and gracious staff to perform their duties, but not his. We had missed the welcome, C-card check, and briefing completely. He did tell me that the best diving season is from December to April, they never come close to the annual limit of visitors, and he invited me to bring my sling and shoot lionfish next time.

Americans willing to accept the challenges and reap the benefits will like diving in Cuba. The diving is not difficult, though one may find the outmoded facilities a little basic. Regardless, I know I will return. Thank you, Anderson Cooper, for highlighting this wonderful place.

-- J.J.



Divers Compass: Cuban Diving Centers, the Tortuga's owner, runs both fishing and diving trips from its liveboards, and its website gives excellent suggestions on money matters and getting there . . . The price runs about \$3,630; the cost in U.S. dollars fluctuates because the package price is in Euros, but it includes round-trip flights from Cancun to Havana, two nights in a Havana hotel, the motorcoach and boat launch ride to and from Jardines, six nights lodging, all meals (including four liters of water and one Mojito per day), and 12 dives, but no night dives . . . The

flight schedules prevented any tourism, so my shallow impressions of Havana are lots of neat old cars, quiet streets, grand old hotels, faded glory and no convenience stores . . . The Cressi rental equipment seemed in very good shape . . . I was told oxygen and first-aid kits were on the skiffs, and the drivers were in touch with base by marine radio and cell phone . . . It is illegal for Americans to spend money in Cuba, and the moment of truth occurs when presenting your CBP form 6059B to the Customs agent upon return to the U.S., so omit listing Cuba; if you are asked if you visited another country than Mexico, you must say yes, but you don't have to incriminate yourself by stating you spent money there . . . Minimize the risk by obtaining a GOES pass (<https://goes-app.cbp.dhs.gov>) to simplify your return to the U.S. from all foreign countries, and bring Euros as your currency . . . Cubana Airlines allows 66 pounds baggage and did not even consider my carry-on; overweight luggage charges are paid by the kilogram . . . Tortuga's website: <http://cubanfishingcenters.com/tortuga.php>

Raja Ampat Dive Lodge, Indonesia

not all the great diving here is only by liveboard

Dear Fellow Diver:

Ting ting! Rico Londam, my dive guide, rapped his steel pointer on his tank. Black-tip reef sharks were down the coral slope. Ting ting! Guide Jamie Lambaihang tapped his own tank. Bumphead parrotfish were grazing the top of the reef. Ting ting! A school of yellow-tail barracuda. Ting ting! Several hundred horse-eye trevally whirled in a slow silver vortex. Ting ting! Come look at this pygmy seahorse! Ting ting! Ting ting! My head was swiveling off my shoulders, and I was making no progress in our drift along Crossover Reef in the Dampier Strait of Raja Ampat. How could I possibly be expected to



One of the Bungalows



see the entire reef if we stopped every minute to see a new wonder, or in the case of schools of fish, thousands of wonders? This was my last dive of the 19 I made at Raja Ampat Dive Lodge, and there were four guides in the 83-degree water with me and my partner, the only two guests at the lodge that week in July (it was entirely booked for August).

Earlier that day, we started our first dive pulling ourselves by hand over the coral into the current at Cape Kri. The lodge brochure recommends bringing gloves but I didn't wear them

until I sliced my thumb open hanging on at Chicken Reef. They also advise you to bring your own reef hook. My partner didn't have gloves (she accidentally left them in Singapore) or a hook, so one guide would precede her, hook the reef and pass the cord back to her. She would pull herself to the hook, where a second guide waited with the cord to his hook. In this leapfrog fashion, her "dive sherpas" got her through the initial rigorous minutes.

Many dives began into the current, the logic being that if we started the dive drifting with the two-knot current, we'd blow right past the reef well before we got to the end of our 60-minute dive time and end up in blue water. So we typically pushed into the wind until we went around a corner or ascended to the top of the reef where, likely as not, the current would change vectors for a gentle drift back in the direction we had come. We would take a five- to 15-minute safety stop on top, passing over luminous displays of purple, yellow, orange and ecru dendronephthya soft corals, dotted with bi-color crinoids and packed with juvenile fish. And fish is what you will see. My count: six species of triggerfish, five species of sweetlips, four kinds of trevallies, three of barracuda, two tunas, various batfish, turtles, more butterflies than I'd ever seen, barramundi cod and so on. Of sharks, there were just black- or white-tip reefs and the ornate wobbegong, but they were on every dive. If you get tired of the big stuff, the guides will find dozens of different nudibranchs, sea horses, pipefish, shrimp, eels, etc.

This profusion of life is not easy to get reach. We flew from New York to Singapore and decompressed before flying all night to Jakarta, Makassar and Sorong, where we were met by Jamie and another guide, Kris Pinustena, at 8 a.m. After shopping for snacks, they took us to the dock for a two-and-a-half hour boat ride to the resort. We passed through a large pod of dolphins and a pocket of marlin before gliding up to the hilly island of Mansuar, with its palm trees lit gold in the noon sun. Just east of Mansuar is Kri Island, home to Kri Eco Resort and Sordido Bay Resorts. Despite our being the only two guests, the lodge, built in 2009, still had a full complement of 40 staff members. When short of divers, it offers locals from Sorong rooms at half price for the weekend. Eight Coast Guard men arrived with their families on a patrol boat, which they used to ferry the kids to snorkeling spots.

Our superior room faced the ocean, but coral, rocks and mangroves prevented any beach entry. Standard rooms were located in a row behind our two-unit bungalow. The A/C and ceiling fans provided respite from the dense July humidity. The queen bed was firm and its mosquito netting came in handy. I took Malarone as a malaria prophylaxis, and my typhoid and tetanus shots were up to date, but there's no preventative for dengue fever, so I used the netting inside and bug spray outside. The large but spartan bathroom had a roomy shower in which, water pressure being at a premium, I ran around to get wet. Staff changed towels every other day, linen at mid-week, and they cleaned rooms and made beds daily.

Bottled water was provided and we were urged to refill our empties from coolers in the open-air dining room.

I had signed up for four dives a day but was chagrined to learn that the fourth dive was either a Mandarinfish encounter off the dock at 5:30 p.m. or a night dive at 6:30 off the same dock. The Mandarins popped out on cue, but the dock area was lousy with lionfish, and I constantly checked my position so as not to bump into one. I finally cajoled the staff into two afternoon boat dives, but didn't get back until 6:30 p.m. when we had to hustle to clean up for dinner at 7:30. I usually knocked off after the third dive and did my logs -- quite a task when there are hundreds of species to identify but only one well-thumbed, three-volume set of fish books in the lodge. Evening would find us sipping a Bintang beer on the dock, watching the clouds turn slowly pink then tangerine. For alcohol, it's Bintang or nothing. Alcohol is not sold in airports, or rarely anywhere else, so BYOB from home.

When there are more guests, meals are buffet style, but our solitary status earned us table service. Breakfasts included eggs, beef bacon or sausage, Asian noodles, fruit, cold cereals and toast. Chef Donny Indrawan pulled out all the stops at lunch. After an appetizer of cold or hot spring rolls or salad, there would be chicken or beef satay in a spicy peanut sauce, grilled calamari, chicken curry or sautéed shrimp in garlic, veggies, and a dessert of black rice pudding or ice cream and cake. Dinner followed the same pattern, with a Western dish like baked spaghetti or tenderloin of beef substituted for one of the Indonesian dishes, then fruit for dessert.

After dinner, I would chat with the dive guides who dropped by to use the wi-fi in the lounge and confirm the following day's plan. The TV room was always occupied by staff members watching Indonesian shows, so I would wander back to my room to read and fall into the Land of Nod before awakening to the snare drum percussion of rain on the corrugated roof of the bungalow, followed by a rattle of branches and the tympani of the odd coconut or two. June through August is the so-called dry season, but this year, it rained every day at one time or another. We were lucky; we had two glorious days of sun and four over-cast days when it rained on and off.

At 7:45 a.m., I would pull on my damp suits and shake my booties. I'm referring not to the sway of my posterior, but rather a method of dislodging any insect having sought overnight refuge in my footwear. No kidding. Once, I found a cricket the size of my forefinger in a dive sock. When I unknowingly stuck my foot in, I thought it was the dreaded Black Scorpion of Mansuar, to the great glee of my partner.

Our gear would already be set up on the boat. The aluminum 80s were always filled to 3300 psi by a new electric compressor 150 feet upwind of the diesel generator. By 8 a.m., we were off on a 30-minute ride on mostly flat seas to nearby reefs. By 12:30 p.m., we'd be back for lunch, rinsing our suits in the tank reserved for rubber. However, by mid-week, I figured out that suits were the only things being rinsed. My regulator and backpack were given just a quick hose-off on the boat, and the wings slowly whitened with salt. There was a separate tank at the shop for cameras and computers, one for suits, one for booties, and another for masks, fins and snorkels, but only the suit and camera tanks were filled. The dive shop had an open storage area with a milk crate for each of us, and a shower allowed us to clean up before lunch. The camera room was never opened, nor was there a photo pro on site.

After a dive, handing up my weights and BC before climbing the narrow ladder made a



The Lodge's Dive Boat

Raja Ampat Dive Lodge, Indonesia

| | |
|-------------------------------|--------|
| Diving (<i>experienced</i>) | ★★★★★ |
| Diving (<i>beginner</i>) | ★★★★★ |
| Snorkelling | ★★★★★ |
| Accommodations | ★★★1/2 |
| Food | ★★★★ |
| Service and Attitude | ★★★★★ |
| Money's Worth | ★★★★★ |

★ = poor ★★★★★ = excellent

World Scale

lot more sense than trying to wedge myself and my gear under the low-hanging sun cover. After banging my head several times on the pipes supporting the cover and conducting an ad-hoc class in colloquial English, I also learned not to stand upright in the boat.

The guides were friendly, attentive, interested in our well-being, and adept at finding macro life, but they were guides, not divemasters or instructors. While the boats had first-aid kits and DAN double oxygen kits, there were no radios. Communication with the lodge was by cell phone. When I asked what they would do if a diver was lost, they said they would call the lodge manager, who

would in turn phone the authorities on Sorong, and then make individual calls to the Kri lodges and liveboards in the area. Several times, we surfaced to find the boat hundreds of yards away and had to use our Dive Alerts in unison to get their attention. We were often within swimming distance of land, and liveboards and other craft were in the area, yet watching the driver pull the starter cord on one engine a dozen times before it caught made me cognizant of where I was.

An all-day, three-tank trip to the north end of Gam Island was nixed because of rough water, so Kris took us to his favorite spot, Citrus Ridge, a saddle between Gam and Yangelo where the "bommies are full" of yellow and orange soft corals, open and feeding in the current. We stayed with a banded sea krait, a poisonous sea snake with a tiny mouth, for five minutes as it foraged in the coral heads.

At Manta Sandy, a line of rocks denotes a highway down which the rays are supposed to pass on cue. However, no one told Manta Central Casting, so my partner wandered off on her own and then frantically banged on her tank when the manta swam through the 80-foot visibility, while the rest of us were amusing ourselves watching the blind shrimp and goby show in the sand. I spotted a large scribbled puffer hanging above the reef and slowly sidled up next to him until we were side by side, only two feet of water separating us. The fish at Raja have no fear.

Between dives the boat would stop at a village or small island, and the guys would serve coffee or tea, cake or fruit, and large bottles of water. At the islet of Friwen, hundreds of giant fruit bats wheeled overhead in a perfect blue sky. That afternoon at Chicken Reef, the guides motioned me to a vantage point behind a small coral head form, where I watched three black-tips and three giant trevally thrash a school of baitfish.

Passing a vast field of blue coral at Kembuba Reef, we parted a river of thousands of yellowtail fusiliers, one bank blending into the blue beneath us, one burnished bronze by the sun above. Rounding the northeast corner, the slope was darkened by clouds of small-toothed emperors accompanied by a few dozen long-nose emperor guards. Further on, blue triggers consorted with hump-back unicorns aided by blue surgeons. Rising to a pastel seascape of soft corals, we surfaced at a deserted white sand beach, and rested on calm water near arching palms.

Is it remote? Yes. Is it hard to get to? Yes. Does it lack a few amenities? Yes. Could the dive operation benefit from an on-site professional? Yes. Was

this flat-out the most outrageous fish-and-critter-rich diving I have ever done on the healthiest reefs I have ever seen and do I wish I was there now?

Yes.

-- D.L.



Divers Compass: I booked with Diversion Dive Travel, the Australian agency that handles reservations for the lodge (www.diversiondivetravel.com.au); the rate through the end of 2013 for a superior room with four dives a day and all meals is approximately US\$2,400 per person, but if you only want the morning dives, \$2,175 will suffice . . . The resort's website notes a special through the end of 2012 that will save \$350, but you need to contact Diversion for an exact quote . . . The lodge operates on a Friday-to-Friday basis (if you wish to arrive on another day, they will charter a boat for you for \$1,000), so your departing date needs to be thought out, unless you want to spend a day or two in Singapore or Hong Kong; you could stay in Bali for a few days, but the connecting flights from Bali to Sorong requires an overnight in Ujung Padang (Makassar), and flying from Manado to Sorong means backtracking to Jakarta or elsewhere . . . The cheapest JFK-Singapore flight I could find was \$1,155 on Delta going through Tokyo; the cost of flights within Indonesia varied widely depending on routes and airlines, but I ended up paying about \$1,120 round trip Singapore-Sarong on Sriwijaya Air . . . Singapore Air did not charge extra for our dive bags, weighing in at 27 kilos each; if you tell the Indonesian airlines that your bags are scuba gear, they may exempt extra fees as well . . . If you do overnight in Jakarta, I highly recommend taking a Club Room at the Mandarin Oriental hotel, because by then, you will need a gin and tonic . . . Two excellent resources are Underwater Paradise by Ricard Buxo, which covers all aspects of Raja Ampat diving and traveling, including health issues, and Diving Indonesia's Raja Ampat by Burt Jones and Maurine Shimlock, available on the Books page at www.undercurrent.org . . . Website - www.komodoalordive.com/RajaAmpatDiveLodge.htm

Improving Rebreather Safety: Part II

oxygen analyzers: the rebreather's weakest link

Last month, I highlighted a number of issues discussed in May at the Rebreather Forum 3 (RF3), sponsored by PADI, Divers Alert Network and the American Academy of Underwater Scientists.

When talking about diver error, it's common knowledge that most sport divers avoid rebreathers because they seem too technical and complex, and it is indeed the technical side that causes problems. Bruce Partridge, CEO of Shearwater Electronics, summed it up this way, "Divers must interpret the readouts from three roaming oxygen sensors, which are known to be unreliable. They dive with no carbon dioxide gauge, and they don't have good data on the risks, or what is most likely to go wrong."

Most experts agree that current oxygen-sensing systems are the weakest, yet most critical, links on a rebreather. If the PO₂ (partial pressure of oxygen) in the loop is too low, the diver will suffer hypoxia, go unconscious and drown; too high, and the diver risks hyperoxia, convulsions and drowning.

But what most divers might not appreciate are the limitations of oxygen-sensing systems, which were made clear at RF3 by Arne Sieber, CEO of Seabear Diving Technology. Sieber explained that the galvanic oxygen sensors, made especially for the biomedical industry, were never designed to be used in diving. In fact, the sensors are meant to be calibrated under the same conditions that they will be used, but that's not how it's done in diving.

"Divers do all the wrong things," Sieber explained. "We calibrate the sensors at 0.2 bar (air) and 1.0 bar (oxygen) at ambient pressure and temperature, then use the sensors at up to 1.6 bar at much hotter temperatures." This leads to increased sensor errors, as well as a decreased lifespan.

Sensors can err because of the gradual consumption of their reactive material and aging, and thus fall out of calibration. Worse is that "transient failures" from a loose electrical connection or condensation cause the sensor to generate erroneous data, and then go back to working correctly when the condition abates. Nigel Jones, principal at RMB Consulting, believes that these "transient failures" are likely behind many unexplained rebreather diver fatalities.

Because of known unreliability of these sensors, the first closed-circuit rebreathers had three oxygen sensors and a voting logic algorithm -- the computer averages the readings from the two sensors whose readings are closest, and uses that average for its oxygen calculations. The idea was that the redundancy of three voting sensors would greatly reduce the risk of sensor failure, and the concept stuck. Today, virtually all rebreathers except the Poseidon use this 50-year-old sensing technology. The problem, says Jones, is that it is simply not reliable. It assumes the failure of sensors is independent; the failure of one sensor does not change the likelihood that others will fail, too. Jones says that's not true; the sensors are dependent because they may have come from the same manufacturers' lot, they experience similar use, share a common environment, suffer common abuse, and use shared measurement and calibration gas. "Having three sensors is barely better than one in some circumstances." Also, risk reduction is eroded further because a diver doesn't know if the reading is correct or incorrect.

During a routine dive, Rich Pyle, database coordinator for natural sciences at the Bishop Museum in Honolulu, found his oxygen sensors read .4, 1.0 and 1.3. At his RF3 presentation, he asked the audience to make the call, "what is the correct PO₂ reading?" (The computer's logic would average the 1.0 and 1.3 reading, and call it 1.15). Unfortunately, the majority of the audience got it wrong. The correct answer was 0.4;

Is a Caribbean Cruise for Serious Divers?

Doc Vikingo, who has written many articles for us over the years, recently embarked on a Caribbean cruise, not so much because he wanted to, but because he somehow won it. Should a serious diver follow his wake?

Cruise ship travel, is seen by many divers, including yours truly, as despoilers of both the environment and culture at their ports of call. Bigger and fancier floating megaresorts are regularly launched and new piers constructed for the vacationing overfed, newly wed and nearly dead at such once-idyllic and hitherto unsullied places as Grand Turk. Despite holding cruising as anathema, some prodding by my significant other and a re-reading of "Taking a Caribbean Cruise on a Ship of Thousands?" (in the July 2005 issue of *Undercurrent*) resulted in my taking the freebie.

I did learn that cruise ships afford some advantages to the enthusiast. A cruise ship allows groups with non-diving members to vacation together, a number of locations to be cost-effectively screened with relative

ease, a nitrogen fix for divers who are not up for dedicated gonzo scuba. And of course, you get to gorge and relax back onboard the mother ship. For the less sedentary, there literally are non-stop activities of one sort or another from early morning to late night, so that you can start with Tai Chi and end with disco.

On the downside, excursion dive packages often involve moo-type ops that are limited to the least-common-denominator divers on the boat, and the padding of prices is routine. Where ship time limitations permit, I strongly recommend that the knowledgeable diver select his or her own dive operator (well in advance). The difference between my cost vs the ship excursion cost ranged from \$20 to \$50, depending upon the port. To be fair, the excursion prices do include transportation from port to the dive shop, and basic gear if you need it, which I don't. Bon voyage.

You can read my full trip report, "Cruise Ship Diving," which includes reviews of the diving on Roatan (Anthony's Key), Grand Cayman (Off the Wall), Belize (Sea Sports Belize) and Cozumel (Liquid Divers) by going to www.undercurrent.org/blog/cruise-ship-diving

the system had experienced a double sensor failure. Fortunately, Pyle got it right. If he had ascended at that point in the dive thinking his PO_2 was 1.15, he would have risked hypoxia and possible drowning.

Leon Scamahorn, CEO of Inner Space Systems, which makes the Megalodon rebreather, pointed out that “Meg” users could go the “millivolt screen” on their handsets, which actually shows sensor voltage (a linear function of PO_2), and with some simple math, determine that the low sensor was correct.

This assumes, of course, that the diver was alerted to the problem in time. But I couldn’t help wondering if I’d have the presence of mind to do “millivolt math” at 300 feet with the stress of a possible alarm and knowing one or more of my sensors were crapping out. Couldn’t a computer do this better than I?

Both Sieber and Jones urged the industry to develop and adopt “active validation” type systems, such as that used in the Poseidon MKVI, which calibrates and test the validity of the oxygen sensors (it uses two) throughout the dive using onboard diluent and oxygen. Sieber added that solid-state sensors, which are currently in prototype form, also hold promise for the future.

However, several rebreather builders I spoke with disagree with Siebers’ and Jones’ assessment, and said that they overstated the oxygen sensing problem, given improvements in sensor manufacturing, testing, and voting logic software. Nevertheless, in consensus, RF3 strongly endorsed industry initiatives to improve oxygen measurement technologies.

PCO₂: The Dark Matter of Rebreather Diving

PCO₂ is the term used for the partial pressure of carbon dioxide, and is a measure of how much carbon dioxide is dissolved in the blood. A high PCO₂ level (0.03 bar and above) can cause hyperventilation, confusion, mental impairment, unconsciousness and death. It may lower oxygen toxicity thresholds in the central nervous system, and it’s believed to be a factor in unexplained rebreather fatalities, hence the moniker “the dark matter.” Worse, the diver may not be aware of the problem before a full onset of symptoms occurs.

Divers have two information needs. The first is to monitor the duration of the scrubber canister, which varies with workload, depth and temperature. The second is to detect a carbon dioxide breakthrough because of a spent canister, mechanical failure or channeling. Kevin Gurr, one of the gurus of carbon dioxide sensing, shared data from a recent Internet survey of 323 rebreather divers using 25 different models of rebreathers. The results were surprising. Twenty-three percent of the divers did not know the maximum operating depth of their units, and another 19 percent did not know the manufacturer’s stated scrubber duration. Forty-two percent of divers said they experienced symptoms of hypercapnia (elevated PCO₂ levels); however, 64 percent of those said they didn’t bail out, while 19 percent said they bailed out sometimes. The results suggest better training -- and a cultural shift -- are needed.

Gurr recounted the methods used to monitor scrubber duration, and noted that while thermal sensing, also referred to as the “Temp Stik” (it’s used in Ambient Pressure, VR Technology and rEvo rebreathers), is a reasonable predictor of duration, it is slow to react to fast-changing variables like work rate. However, none of the methods is able to detect carbon dioxide breakthrough, e.g., a catastrophic scrubber failure due to spent carbon dioxide-absorbent material, a seal failure or channeling (the creation of a channel through the scrubber bed, which enables exhaled gas to bypass the absorbent).

Dan Warkander from the Navy Experimental Diving Unit reminded us of the days of early scuba, when divers didn’t have a pressure gauge, so instead dived with a J-valve. “Wouldn’t it be nice to have a gauge

The Mouthpiece Retainer

Though it’s not the trigger, the primary cause of death in most rebreather fatalities is drowning. Some of these fatalities might have been prevented if the diver had used a retainer to secure his mouthpiece. Full-face masks and retainer straps have long been the standard in military diving, and they were also a key recommendation from the Rebreather Forum 2 in 1996. While full masks are not very suitable to sport diving, retaining straps have the potential of saving lives.

for your scrubber to tell you how much time you had left?" Warkander explained that scrubber duration can vary by a factor between 5 and 20, through combined effects of workload, temperature and depth. What's worse, when a scrubber is spent, the threshold between no CO₂ and too much can happen in a matter of minutes.

As far as detecting scrubber break-through or a seal failure, VR Technology's Sentinel is currently the only production unit with a gaseous infrared CO₂ sensor. Gurr said that we are 80 percent there in fully characterizing a proper CO₂ absorption system. The last piece is a mouthpiece sensor that can measure end-tidal CO₂, regarded as the "Holy Grail" of CO₂ monitoring. Gurr estimated it is still at least three years away.

RF3 acknowledged the poor understanding of operational limits with regard to depth and scrubber duration among trained rebreather divers. Panelists recommended that training agencies do more to emphasize these issues, and manufacturers make data more readily available.

Dive-By-Wire?

Poseidon's latest lovechild, the Poseidon TECH rebreather, is scheduled to ship this November, and features the latest in diving automation. "Our goal is to increase the level of automation by using smart systems that monitor every breath, make adjustments accordingly and interact with the user only when they need to know what's going on," said Poseidon CEO Peter Swartling.

In addition to the many automated features in Poseidon's MKVI recreational rebreather, (such as a wet switch, an auto-checklist that verifies cylinders have the correct gases and that their values are open, and auto-oxygen sensor calibration and validation), the new TECH offers a "Dive-by-Wire" handset that is truly breaking new ground. Smaller than an iPhone, the device provides system information to the diver, letting him control the rebreather to the extent of doing a loop flush or adding oxygen at the touch of a virtual button. The computer, of course, would warn or prevent the diver from taking an action, like adding oxygen if it was ill advised.

This level of automation gave the heebiegeebes to many tech divers I spoke with, but I can't help wondering if this is indeed the future of dive automation. Granted, roughly 15 percent of rebreather divers prefer a strictly manual unit without an electronic solenoid switch for adding oxygen, and other groups, like the "Doing It Right" community, don't even trust dive computers -- not the kind you strap onto your arm, anyway. Ironically, I'm sure most of these people have no trouble trusting their cars' anti-lock braking systems versus feathering the brakes on their own. In fact, their vehicles depend on computer automation, as do the commercial aircraft that flew them to RF3.

Bill Stone, CEO of Stone Aerospace, which builds autonomous vehicles for space exploration (and is working with Poseidon on its new TECH rebreather), addressed the issue by posing the question, "Can we trust automation?" He recounted the development of the autonomous car that can navigate city streets sans driver, and showed video of prototypes in action. Stone said that within five years, you'll be able to buy a

car that will drive you home if you had too much to drink, and it will do it as safe as, or safer, than a human driver. Could rebreathers be far behind?

One of the major problems in rebreather (or car, train, plane, spacecraft, etc.) safety is humans' ability -- or rather, inability -- to manage and operate complex machines without incident. Stone's solution, similar to that of VR Technology's soon-to-be released Hollis Explorer, is to simplify the human machine

Rebreather Resources

RF3 included several discussions of how rebreather incident reporting and analysis could be improved, resulting in several forum recommendations. In addition, DAN announced its new online non-fatality dive incident reporting system for rebreathers, which was endorsed by the Forum. (<https://DAN.org/IncidentReport>)

You can read all the consensus statements from RF3 at <http://rubicon-foundation.org/News/rf3-consensus>

interface by reducing the ways people interact with these systems, and letting the computer do more of the work. “We have to move out of the test pilot era to a new paradigm,” he said. Given that Stone’s vision 25 years ago helped drive the creation of a consumer rebreather market (he could arguably be considered the godfather of modern rebreathers), his ideas should not lightly be dismissed.

The Final Question

At RF3’s closing session, Andrew Fock, head of hyperbaric medicine at the Albert Hospital in Melbourne, Australia, walked up to the mike and put the following question to the community, “Given that fatality rates are five to 10 times that of open-circuit scuba, should we morally offer this technology to the recreational diving community before putting our house in order?”

There was silence as if no one wanted to tackle the question, then another participant took the stand and changed the topic. Eventually, Mark Caney, PADI’s vice president of rebreather technologies, worked his way to the mike and addressed his comments to Fock.

“Yes, we should,” he said. “Within certain parameters.”

Michael Menduno, based in Berkeley, CA, published and edited the monthly magazine aquaCorps: The Journal for Technical Diving (1990-1996), which helped usher technical diving into the mainstream of sport diving. He also organized the first Tek, EuroTek and AsiaTek conferences, as well as Rebreather Forums 1.0 and 2.0.

More Etiquette from the Scuba Snobs

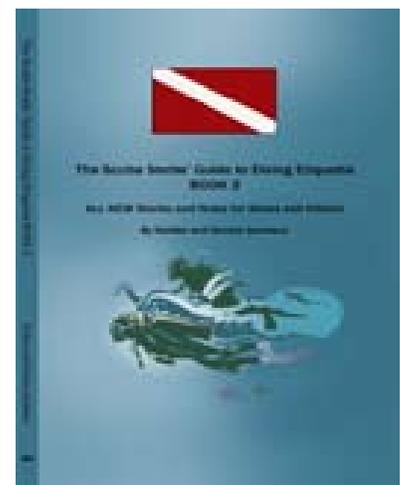
additional rules for you to dive by

Last year, we published excerpts from Dennis and Debbie Jacobson’s self-published book *The Scuba Snobs’ Guide to Diving Etiquette*. After receiving so much fan mail asking for a sequel, they produced it, with plenty more flouted and unspoken rules of diving. Based on additional “reporting” from recent dive trips and direct input from their readers, the Jacobsons have all new Dos and Don’ts for sport divers to follow.

Here are a few to follow from their new book, *The Scuba Guides’ Guide to Diving Etiquette: Book 2*, but for all the rules -- plus the fun, insightful stories the authors use to illustrate them -- order a copy of this book (and its predecessor) on our “Books” web page.

Don’t Loiter in the Entry and Exit Areas

We were on a day boat in Hawaii with about 20 divers aboard. It was a fairly calm day for the Pacific, with one- to two-foot-high swells at most. Following our first dive, people needed to re-board to change out their tanks for the second dive. As we floated in the water waiting our turn to board, Missy Jane boarded, stopped right above the boat ladder and started chit-chatting with a crew member, who apparently enjoyed the encounter. As his vision was locked on Missy Jane about 12 inches below eye level, neither he nor Missy Jane realized another diver had started to climb aboard. That diver was not looking up. He was focused on maintaining footing on a wet ladder. As a result, the boarding diver unknowingly butted Missy Jane’s butt with his head, sending her stumbling forward and into the crew member, who then fell into another diver who had boarded before Missy Jane and her cleavage. All three went down, but avoided serious injury. It could have been much worse.



The lesson is clear: To avoid collisions when re-boarding a crowded boat, move away from the re-boarding area as soon as you get aboard. It's also important to pay attention to what you are doing rather than staring at another person's body parts.

Leave People Alone Who Are in No Hurry to Get Back Aboard

If a diver is obviously "off gassing" (for those of you who haven't read the first book, that's a euphemism for peeing) or did recently and is honoring the "five- minute rule" (see book 1, pages 8-9), then please board and let the other diver rinse off for another minute or two. If you are ever diving with us,

Anatomy of a Dive Death Investigation

We have run many stories about how dive deaths are investigated, both here in the U.S. and in other countries overseas. It's a common lament in this country that we often don't have much public information about deaths to help divers or dive agencies understand the causes -- and how to correct them. This story, which ran in the *Caymanian Compass*, shows how much information can be provided by a coroner's report -- and how it can change opinions and even court rulings -- on unfortunate dive deaths. In the case of Vickilee Hettenbaugh, her death last year in Grand Cayman was ruled to be a "misadventure" on her part, after a coroner's jury heard details of her dive and the results of her autopsy report.

Hettenbaugh, 54, was a Florida native on vacation in Grand Cayman, making a shore dive off West Bay with her husband, Donn William Berg, on the morning of February 8, 2011. They had their own gear, but rented tanks and weights from Divetech. Steve Chenoweth, a dive instructor at Divetech, testified that the couple had signed the requisite forms with their dive certification numbers, and, from the way they assembled their equipment, he was confident they were experienced.

Around 11.15 a.m., he heard a cry for help and saw Berg supporting Hettenbaugh on the surface, about 75 feet from shore. He swam out, putting a life ring under her head to keep it out of the water. Divetech staff helped get her to shore and administered CPR until the ambulance arrived. Hettenbaugh was taken to George Town Hospital, where she was pronounced dead. A police officer secured her equipment, had it photographed and took it to Scott Slaybaugh, deputy director for the Department of Environment, who reported that the dive equipment was in good working order and well-maintained.

Berg told police he and his wife dived about 12 times per year, and this was their third trip to Cayman. Hettenbaugh had been diving since 2002, was a competent and cautious diver, and he never saw her panic. She was in good health, and while she had occasional migraines and took half a sleeping tablet for them, she didn't do so while in Cayman. On that fateful day, they had decided to dive a shelf about 300 yards from shore, and go down 60 feet. She needed about 13 pounds of weight. On their return, Berg was ahead of her, and when he looked back, she was swimming normally. When he looked back again, he did not see her. He was at 30 feet when he looked up and saw her on the surface. He inflated his BCD to get to her quickly. Hettenbaugh's regulator was out of her mouth, and her spare regulator was still clipped to her chest. Berg tried to give her "mouth to mouth," but couldn't get her to breathe, and so called for help.

Richard L. Laube, another Cayman tourist, told police he and a friend were diving with underwater scooters and chatted with Berg and Hettenbaugh before the dive. The couple went into the water before he did, and when he went out to the wall, Laube saw two divers coming down to 50 or 60 feet. "We waved to them, and I think the male waved back to us," he told police. "When we saw them in the water, they looked fine."

Coroner Shravana Jyoti testified about the autopsy he conducted. External examination showed no evidence of violence, trauma or fracture. Tests for alcohol and recreational drugs were negative. He said he found multiple tears over the lobes of both lungs, and multiple small areas of hemorrhage inside, along with frothy fluid. The combined weight of the lungs was 1,800 grams; the expected weight would have been around 850 grams. The multiple tears and hemorrhages were highly suggestive of acute pulmonary barotrauma, which is damage to the lungs from rapid or excessive pressure changes. The frothy fluid in the trachea was highly suggestive of drowning.

The physical cause of death was reported as acute pulmonary barotrauma and sea water drowning. Jyoti listed as a significant contributing factor "rapid ascent while scuba diving from a depth of 60-30 feet to the surface. Trigger unknown."

and see Debbie and Dennis still in the water, just assume that it's Debbie who is peeing or just peed, because that is what is happening, and Dennis is waiting for her (up current), like the gentleman he is.

If you offer to let a person board before you and he responds, "I'm OK, you go ahead," it means they are peeing or just peed. There should be no debates in the water about who is next when it is time to re-board. Keep the line moving, but remember the five-minute rule if you pee at the end of the dive. If you are not wearing a wetsuit but diving in only swimwear, you may reduce the wait time to board following peeing from five minutes to one minute.

If a Tourist Submarine Passes near You when Diving . . .

The only appropriate gesture is a friendly wave or its equivalent. A friendly wave is done with the entire hand, not just one finger. Don't flip off the sub or its passengers. Other gestures of contempt, usually associated with specific countries or ethnic groups, are also inappropriate. A shaka gesture is OK, but gang signs and signals are not. Remember, you are part of the exhibit, like the shark in the aquarium or the elephant in the zoo. Be friendly and polite. Smile. You can even remove your regulator to give a nice smile so one of the passengers on the sub can get a good picture. Sticking out your tongue is not appropriate, however.

Don't "Moon" the Passengers on a Tourist Submarine

We have received several reports from readers who have witnessed this inappropriate behavior. Not surprisingly, all of those offenses occurred in warm-water venues. That makes sense, because if you are in a full wetsuit with buoyancy vest and weight belt, you are not going to moon anyone. You could do it with all your gear on, but no one would notice or care. However, if you are in water warm enough to dive in only swimwear and maybe a rash guard, the possibility and the temptation does exist for you to "drop trou" and give the passengers a vertical smile. Even though all the complaints about this behavior dealt with guys doing it, we also received reports of girls doing it. In those stories, though, no one was complaining about the girls' actions. To be fair to everyone, boys and girls, please keep your trunks on when a tourist submarine passes by.

Don't Pressure Your Buddy to Start or Continue a Dive

Part of good manners is being sensitive to your dive buddy's feelings, including how he feels physically, and whether he is feeling stressed or anxious about doing a dive. Don't pressure your buddy to do a dive that she doesn't want to do.

We saw this rule violated once when we were diving in Cozumel. A boyfriend/girlfriend buddy pair was together, and Girlfriend had just completed her certification dives. Boyfriend was an experienced diver. Off we all went on a day boat to dive Columbia Wall. Girlfriend didn't really want to do the dive. Boyfriend made a big scene, yelling at her, belittling her, blaming her for ruining the trip, and otherwise saying things that we are pretty sure led to the rapid end of their relationship. His acting out sucked all of the positive energy from the dive boat, and we did not like him. Neither did anyone else on the boat. Of course, none of his efforts caused her to do the dive. Surprisingly, he found another buddy (not us) and dove without his girlfriend (his next mistake).

Non-Divers Should Take Steps to Pamper and Warm Divers after Night Dives

If you are aboard the boat, or standing by as the "shore guy" for a night dive, then you are responsible for the pampering of the divers as they emerge after their dive. Two primary tools for pampering night divers are warm towels and hot beverages. If you are on a remote beach, the warm towels may be a problem, but even then, you should at least have an abundance of dry towels and drape each diver in one as soon as they remove their gear.

Pampering of night divers includes assisting them out of their equipment, assisting in the stowing of equipment, and also patiently listening to them tell you how wonderful the dive was, and how it's

too bad you weren't with them, even if you wish they would shut up.

No Guy Should Wear a Tank Top Dining Indoors

And some guys should never wear a tank top, ever. This rule is kind of like the "cover up" rule in the first book. Don't embarrass yourself or those around you by being inappropriately dressed in public. Remember, you want to be an ambassador of our sport, encouraging other people to dive, and to act responsibly in the marine environment and on land. So take a shower, put on a clean scuba logo shirt that covers your shoulders as well as your belly, and prepare to tell everyone about the fantastic stuff you saw diving that day. If you don't stink, others might just linger close enough for a time to hear what you have to say.

If You're Not a Group Person, Don't Go on Group Trips

The answers to the following questions will help you determine if you are a group travel person:

Do you have special dietary requirements when travelling?

Have you ever been late to catch a bus, train, airplane or boat?

Were you an only child?

Have you been divorced more than four times?

Have you ever been kicked out of any club of which you were a member?

One Cavern Plus Panic Equals Four Deaths

Having studied hundreds of diving deaths over the years, I always shudder when I read about unsuspecting sport divers heading into a cavern, stirring up silt, getting deeper into trouble, and finding no way out. Sadly, four divers died near Palinuro Italy on June 30, and here are the reports from CNN and the *Telegraph*:

A British diver who had been living in Rome is believed to have been the leader of a party of divers who lost their bearings after kicking up mud from the floor of the "Blood Grotto," a popular destination with amateur divers because of its red walls, caused by a bacterial growth. According to Italian investigators, the group missed the exit to the cave after becoming confused, and instead entered a nearby tunnel, which led to a chamber with a dead end.

Massimo Ruggiero, the Coast Guard commander in Palinuro, said, "The entrance to the cave is through a tunnel at a depth of 13 to 14 metres. The group should then have swum up to a higher tunnel and made their exit from the cave through that. Beneath this channel, there is another tunnel that leads to a dead end in a chamber with a sandy floor. All the victims were found there."

Marco Sebastiani, one of four other divers who survived the tragedy, said he realized something was wrong when he saw their guide showing signs of agitation, but at that point, it was too late. "We suddenly found ourselves in a blind tunnel. We couldn't see anything. At that point, it was panic. The agitation of the least experienced took hold. Mud and sand came up from the bottom of the cave, and visibility was gone. At a certain point, I managed to find my way. I took as many people as I could with me, and we swam towards the light, which grew bigger all the time. When I came up, I looked around to count us, and I realized that Susy, Andrea, Douglas and Panos weren't there."

Roberto Navarra, the diving school owner who provided the group's equipment, confirmed that four of the group had swum into the wrong tunnel. "It's an easy cave, but there is a dangerous tunnel that people never use. Four people swam into that channel." He said he had tried repeatedly to save the missing divers but "the visibility was terrible. You could see nothing." Navarra said the group was correctly equipped and carried torches.

Valter Ciociano, an expert diver from nearby Marina di Camerota, said many of the 35 underwater caves that draw divers to the area have muddy bottoms. "Often when you go in, the water is clear and you don't notice that your flippers are muddying the water behind you, creating what seems an impenetrable wall. On these occasions, it's panic that rules the day."

The underwater caves do sometimes contain small air pockets under the roof, but experts say they are no guarantee of safety. In many cases, the air would not be breathable because of the presence of poisonous hydrogen sulphide fumes.

Have you ever been kicked off any form of public transportation for behavioral reasons?

Have you ever been convicted of a felony involving an act of violence?

When you were in school, were you ever tardy to class more than three times in any week?

Are you easily annoyed?

Do people often find you annoying?

Have you used the phrase “My way or the highway” in the past 12 months?

Are you a registered member of the Libertarian Party?

Are you presently taking more than three different forms of medication for behavior modification or mood control?

Do you get stressed out if someone is sitting in your favorite seat at school, church, the dive boat salon, or in your own home?

Have you ever been “shushed” by a stranger or an usher in a movie theater?

If you answered yes to six or more questions, never travel with a group of eight or more people, ever.

If You’re Going to Skip a Group Outing, Tell the Group

Dennis recalls a certain liveaboard trip during which many of the guests opted for a shore outing to Bimini to get beer and other things unique to that Bahamian island. While all were ready to go, as time was wasting, one person did not appear for the shuttle to shore. Everybody waited... and waited... in the hot sun...with clothes on, for crying out loud. After about 15 minutes, someone (guess who?) finally decided to knock on the absentee’s cabin door and inquire as to his status. There was no answer. Loud knocking finally elicited a sleepy response, an open door, and the missing person reporting that he decided not to go ashore. That person could have let people know ahead of time.

Books to Make You Smarter Divers

buy them through us, help to save the reefs

You may not be aware of how many helpful books for divers have been published in the past few years, but they’re all available from *Undercurrent*. Go to our list of books at www.undercurrent.org/UCnow/booklist.shtml. Click on any book listed, you’ll get the best price offered by Amazon.com, and our proceeds will be plowed back in to saving reefs and oceans.

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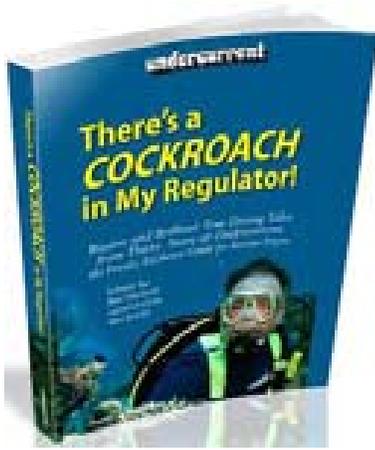
And thanks for supporting us.

— Ben Davison

Dive Travel Guides

Diving Indonesia’s Raja Ampat, by Burt Jones and Maurine Shimlock. This 146-page book is filled with descriptions of mind-blowing dive sites, photos of unusual critters, and good descriptions of the area, the people and what you need to know to dive there.

Diving Southeast Asia, by Beth and Shaun Tierney. A must for anyone contemplating diving in Indonesia, Malaysia or Thailand. Maps make it easy to pinpoint dive destinations and travel routes. Descriptions of 250 dive sites include tables on depth, visibility and currents.



Fifty Places to Dive Before You Die, edited by Chris Santella. A bevy of well-known divers wax about their top dive destinations, ranging from Indonesia and Utila to cold-water spots in the U.K. and New Zealand. The descriptions are brief and to the point, just enough to help you decide whether to do more research for your next dive trip.

Fish Identification

The Reef Set: Reef Fish, Reef Creature and Reef Coral (3 Volumes), by Paul Humann and Ned DeLoach. The three-set ID books are the unparalleled sources for information on Caribbean sea life and identification. These have been recently updated and expanded, with scores of new critters, even better photos and information unavailable anywhere else.

Coral Reef Animals of the Indo-Pacific, by Terrence M. Gosliner, David W. Behrens and Gary C. Williams. Perfect for your next muck dive, a complete guide to help you identify the uncountable variety of weird critters you'll see on any Indo-Pacific dive, complete with full-color photos of 1,100 species. The three marine biologists cover reefs from the Solomons to Sipadan, Palau to Papua New Guinea, with good notes to help you find and identify each critter.

A Diver's Guide to Reef Life, by Andrea and Antonella Ferrari. This colorful reference guide has 1,300 excellent color photographs of tropical marine species in reefs worldwide. The authors also give tips for better underwater photos.

Hawaii's Sea Creatures, by John Hoover. Know more about the islands' undersea realm through 600 color photos of lobsters, nudibranchs, octopuses, corals and a host of other lesser-known creatures encountered by divers in Hawaii. As in his fish ID book, *Hawaii's Fishes*, Hoover provides scientific, common and Hawaiian names for each animal, and a generous paragraph or more detailing its natural history, ecology and cultural importance.

Reef Creature Identification: Tropical Pacific, by Paul Humann and Ned DeLoach. The definitive identification guide to the region, featuring 1,600 extraordinary reef creatures of the Tropical Pacific. In this softbound guide, you get upwards of 2,000 exceptional photographs, including several photos of some creatures during their different life stages.

Adventure

There's a Cockroach in My Regulator, by Undercurrent. Our book 240-page book is filled with 30 years of the best of the unusual, the entertaining, and the jaw-dropping stories Undercurrent has published. They're true, often unbelievable and always fascinating.

The Devil's Teeth, by Susan Casey. In this bestseller, Casey writes about her time spent living on the barren Farallon Islands, home to the world's biggest gathering of great white sharks. She gives a fascinating account of the sharks, their behavior, killing strategies and long-distance travels, and life with the researchers who track them.

Shadow Divers, by Robert Kurson. A German U-boat discovered at 230 feet off of New Jersey in 1991 is the setting for this thrilling adventure, where divers on compressed air fight narcosis, ripping currents, bad visibility -- and themselves. Perhaps the best dive adventure ever.

Photography

A Diver's Guide to the Art of Underwater Photography, by Andrea and Antonella Ferrari. This book is filled with spectacular images designed not only to offer great technical guidance, but also to help the underwater photographer discover and develop the artist within. Rigorously field-tested digital techniques; the hidden techniques behind imaginative framing and lighting, wide-angle and fish-eye to macro

photography -- that and much more is in this highly-readable, technically-accessible, step-by-step guide.

Master Guide for Underwater Digital Photography, by Jack and Sue Drafahl. The book for digital photographers at levels, covering professional exposure and lighting techniques, dealing with blooming and backscatter, super macro, equipment maintenance. Includes scores of photos and diagrams every digital underwater technique. When you're back home from the dive trip, pick up the Drafahls' *Adobe Photoshop for Underwater Photographers*.

Step Zero: Getting Started on a Scuba Photo Trip, by Dennis Adams, and Cathy and Peter Swan. This book provides a full 17-page checklist of everything you need to travel and shoot for an underwater photography dive trip, plus an orderly planning and procurement schedule, and scores of insider's tips. An essential for anyone planning a first-time photo safari, just as useful for any diver who still kicks himself for leaving home without that one crucial item and missed out on a once-in-a-lifetime opportunity below.

For Kids

Shark Encounters, by Michael Patrick O'Neill. The text is for grades 1 to 4, but the photos are for all ages. O'Neill has a section for each shark type, with some description about markings, behavior and favorite meals. It will spark kids' interest in learning more.

World Without Fish, by Mark Kurlansky. The author of *Cod: A Biography of the Fish That Changed the World*, offers this full-color graphic novel for kids ages 11 and up, about what's happening to fish and the oceans. It also tells kids exactly what they can do to help them. A *Silent Spring* for a new generation.

This Was a 13-Year-Old's First Dive

Even if you dive daily in less-than-stellar conditions, you should have enough sense to realize that, if it's a day with strong current and poor visibility, you shouldn't be taking a youngster on his first openwater dive -- especially when there's no one on the boat to monitor your return. According to the *Mobile Press-Register*, two experienced divers from Gulf Breeze, FL, and a 13-year-old making his first openwater trip were rescued by a recreational fishing boat on the night of August 2 after a strong current made it impossible to swim back to their anchored boat.

The three were anchored 15 miles south of Orange Beach, AL, when they started their dive about 2:30 p.m. They were aware of the strong current and poor visibility, but went ahead with the dive because it was the boy's first trip. Upon surfacing, they realized the current had carried them much farther from the boat than they'd anticipated, and they could not make headway against the current to get back to it. Without a bubble watcher on the boat waiting for them to return, they had no choice but to drift with current and wait to be found.

A family member told the *Press-Register* that the men "dive just about every other day, so they were prepared for anything." As for the boy, well, probably not so much.

Luckily for them, the crew of the Reel Worthless was preparing to fish the Orange Beach Billfish Classic, going out past the tip of the Perdido Pass jetties that evening. At 10:30 p.m., Myles Colley was steering the boat 15 miles south of the pass when he caught sight of three green strobe lights blinking ahead. He eased closer and focused a spotlight on the blinking lights. "That's when we could hear them yelling and screaming and blowing their whistles," Colley said.

The crew got the divers, who were clinging to an inflatable tube, into the boat. Despite the 85-degree water temperature, the 13-year-old looked to be suffering the early effects of hypothermia after eight hours in the water, so the crew wrapped him in a blanket. Colley said one of the divers knew the GPS numbers where his boat was anchored, and requested that they be taken to it. He said the divers had drifted about three miles southeast of their boat's location.

All three divers were unharmed, according to the family member, but perhaps wiser for the experience. "They did it against their better judgment and they got in trouble. They'll live and learn from this and they'll try it again." Hopefully, that teenager knows now when not to follow in those so-called experienced divers' footsteps.

Flotsam & Jetsam

Another Recall of High-Pressure Hoses. We've written a few stores about Miflex, the issues with its double-braided, high-pressure hoses bursting at the consoles, and how the company had to recall 17,000 of them in North America last May. One of the dive shop owners we interviewed told clients to go for Phantom, hoses over Miflex. Well, turns out that Phantom is now issuing its own recall -- its double-braided, flexible high-pressure hoses can burst at the crimp fitting attaching to the first stage, leading to rapid depletion of air in the tank. The recall applies specifically to the 11Q3, 11Q4, and 12Q1 lots (the date codes) of those hoses. Phantom hose users should check the hose male fitting that screws into the regulator first stage -- if the hex is stamped with one of those date codes above, send the hose to Innovative Scuba Concepts, the distributor (no packaging or proof of purchase required). For all the details, go to www.innovativescuba.com/Phantom-hose-recall.html

Keep Your Dentures In While on the Dive Boat. Or at least don't clean them over the side. That's what British diver Keith Ashmall was doing while on a dive trip near Nab's Head in St. Bride's Bay. They slipped out of his hand while he was cleaning them. The captain immediately dropped anchor, and members of Ashmall's Pembrokeshire dive group hopped in to search for his choppers. After 90 minutes of searching, the slippery teeth were found at 65 feet. Talk about great dive buddies -- they saved Ashnall from paying US\$400 for another set of dentures.

Not Following in Dad's Footsteps. Guy Harvey is known for his marine life artwork and conservation work, but perhaps he's not passing on his teachings to his daughter. While the Guy Harvey

Expeditions Team was in Isla Mujeres last month to film whale shark gatherings there as part of a new documentary, Jessica Harvey, 22, took a film break to do some fishing and caught a 600-pound-plus swordfish, the largest caught on rod and reel by a female angler in the last 30 years, and the largest on record in Isla Mujeres. Jessica fought the fish for nearly three hours, then posed with her proud papa in front of the strung-up fish for a photo op. Very surprising for a man who calls himself a conservationist. What happened to catch and release, especially when they don't make swordfish of this size like they used to?

This Hit-by-a-Boat Diver is to Blame. The sherriff deputies in Ontario County, NY, show no mercy when it comes to divers who break the laws, even if they're the ones who get hurt. Frank Porter of Penfield, NY, was diving 20 yards off the shore of Canandaigua Lake when he was hit by a pontoon boat while attempting to surface. Porter, 63, broke his right arm, and the pontoon driver got him to shore, where he was taken by ambulance to the hospital. When the deputies arrived to investigate, they quickly ruled out drugs or alcohol as having a role in the incident, but they did issue Porter a citation for not using the proper marker flag while diving.

A Good Signaling Device. Next time you're diving, consider wearing a yellow bikini. It came in handy for Candy Tutino of Naples, FL, when she got separated from her husband and son while diving in the Gulf of Mexico last month. The Tutinos had taken their boat four miles offshore, and when Candy surfaced from the dive, the boat had drifted away. She started swimming for shore, but then had the idea of tying her yellow bikini top to a flipper and waving it in the air to attract boaters. It caught the eye of David and Lyn Hunerberg in their 58-foot boat. Luckily, Tutino was only three-quarters of a mile from shore, but she still enough time to put her top back on and look decent before arriving back at shore, where her family had alerted authorities.

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