

# Undercurrent

*The Private, Exclusive Guide for Serious Divers*

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## Socorro and San Benedicto Islands, Baja Mexico

*—The Copper Sky, the Baja Treasure*

Dear Reader:

The diving at the Islas Revillagigedos (Socorro and San Benedicto Islands), several hundred miles south of the tip of Mexico's Baja California, has been touted as comparable to the Galapagos. One hears of mantas waiting to be ridden, whales surfacing off the bow and other tall tales of the high seas. Two live-aboards travel to these islands --the Copper Sky and the Baja Treasure. Here are our reviews from correspondents aboard each vessel the same week.

\* \* \* \* \*

After selling the Baja Explorador, the travel company Baja Expeditions found Russ Weisner, a Canadian expat willing to charter his seaworthy 72 ft schooner, the Copper Sky, for long trips from Baja, Mexico.

The day after Thanksgiving, Expeditions' staff picked up our group of eight at the Cabo San Lucas hotel and drove us 90 minutes, halfway to La Paz, to board the boat off the beach. We loaded our bags on a small, unsteady skiff that took a huge wave and almost capsized. The bag containing my clothes got a good soaking. Fortunately, the sun was out and a breeze was blowing, so I could dry my clothes.

It's a long and boring 36 hours to the islands, with time to get everything put away, charge your batteries, meet your fellow divers and read a book. The passage to and from was rough; two weak-stomached people spent most of the time flat on their backs. Many days, the seas picked up and the weather deteriorated rapidly until it blew hard wherever we were (we were told this was the worst weather in 26 trips over six years.)

The Copper Sky is a narrow sailboat whose sails were often hoisted for speed and stability. It was not built as a dive boat nor does it perform as one. Space is cramped. There are no dive lockers, so we had to work out of our divebags. There are a couple of places to charge batteries (extra electrical strips came in handy), and we used the salon for cleaning cameras and changing film.

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Tank racks on both sides of the boat shrink the narrow gangways. Once BCs and regulators were hooked up, it was impossible for two people to pass each other without serious contortions. Anyone trying to get around had to climb over the wheelhouse or galley. After donning my gear, I would stagger around the deck, sliding precariously to the exit gate for a giant stride entry. Using rope, the crew handed down cameras to divers in the water. One diver watched as his camera disappeared when the rope gave way. He recovered it after a record descent.

We were dropped close to the dive sites, and left free to dive our own computer profiles. At the end of each dive, Luis, a crew member, or Mike, Baja Expeditions' divemaster and an old hand at spotting divers in gray water and 15 ft swells, would pick us up. Then, it took good timing and the right wave to climb aboard the mother ship.

Once, I surfaced in a surge so high that I couldn't see the boat. I relaxed when I saw Mike puttering out; he had kept an eye on my bubbles as I decompressed at 15 ft. Luis was another story.

## Socorro Alert

Just as we go to press, we have learned that trips to Socorro have been temporarily halted by the Mexican government. Volcanic activity about four kilometers off Socorro, not an unusual event in the Pacific Rim, has been generating pumice that has floated to the surface. The temporary closing of the area gives seismologists the opportunity to monitor the activity.

Everyone had the experience of whistling, waving, honking dive-alerts, or inflating safety tubes to attract him. One couple once had to swim back to the boat, because none of their signals were acknowledged. Mike tried to rectify this, but it proved hopeless; Luis did not improve during the week.

One day, we spotted three dozen mantas just below the surface off O'Neal rock (Socorro). Everyone jumped

in with cameras, some on snorkel and some on scuba. It was awe-inspiring to watch these huge, graceful creatures swoop around, performing a ballet just for us. One afternoon, mantas swam on the surface around the anchored boat. The siren call was too strong for our divers, who leaped over the side with snorkels to play with the feeding animals. Another time, I was alone underwater waiting for action, and heard the high pitched whistle of dolphins. Several 360 degree turns later, I saw two dolphins go by me 40 feet away.

The highlights were dives on the Pinnacle. The first day, a couple of mantas took a few of us on rides. The next day, at least 10 huge mantas had slug-like remoras on their heads. After being warned by a fellow diver of the remoras' sea lice, I took care to grab the manta!

If mantas don't want to be ridden, they speed away. But on this dive, plenty volunteered. One swooped over my head, then hovered until I climbed aboard for an amazing roller coaster ride. Somehow, I managed to hold my camera in one hand and grip the manta with the other, while clearing my ears and keeping an eye on my depth gauge and ascent rate. Some mantas played chicken, swimming at each other head on, then, at the last minute, flying to the surface, belly-to-belly.

One would expect that being so far from civilization, no other boats would be present. Wrong. The Baja Treasure, repped by See and Sea, was right there.

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Having made only one previous journey to Socorro, her crew relied heavily on Mike's knowledge for their diving. Had we been the only boat, we would have made several more dives at the Pinnacles, but we didn't want to be part of 20 divers jumping on the mantas. So, at the outset we made a deal -- one boat to a site.

Diving was about mantas. Without these critters, I was easily bored. Sometimes I kicked to the rocks to look for macro stuff, but even that was lacking except at the Pinnacle. There I saw a couple of tiger eels and an octopus. On other dives, jacks and Clarion angels appeared. Night dives were uninspiring, with little creature action. The weather led to 50-60 foot visibility, water temperature about 80 degrees.

Meals? Due to a lack of freezer space, bread ran out after several days, and tortillas were substituted. Breakfasts were cereals, eggs, pancakes. Lunches were sometimes bland chicken fajitas, but often great, fresh, homemade soups. Dinners were heavy British-Canadian cuisine: meatloaf, chewy steaks, roast chicken with roast potatoes and vegetables. Some nights we had fish, caught and frozen on earlier trips. Salad was always served. Ice cream was offered each night, and some nights fresh baked cake or pie appeared. Until the last banana disappeared into a daiquiri, fresh fruit was available between dives, and some-times cookies or crackers and cheese were served. The cook often prepared great guacamole before dinner. Over the last couple of days, we ran out of rice and some food had to be rationed.

There was no shortage of booze, though. Wine and beer were gratis and the captain's supply of liquor was left out for fresh margaritas or daiquiris.

As for cabins, request one of the two amidship (portside is larger than starboard). One behind the kitchen is hot and noisy - the main entrance to the engine room was through this cabin. Behind the fo'c'sle is a damp and narrow cabin with practically no storage space. It shares an entrance with crew quarters, so the door between this cabin and the crew was often open for air circulation. The smell of the crew's dirty underwear was far from sweet. The only privacy this cabin had for changing was either in the bathroom (which was often occupied) or by locking the door to the crew quarters and leaning against the other door. Air circulation was a problem on the boat. When all portholes and hatches were closed because of rough weather, there was no circulation at all. When the galley was going at full blast, the heat in the salon especially, and the rest of the boat, became unbearable.

Baja's description of the boat shows a guest shower and head amidship, with a crew shower and head in the stern; the crew used the guest head and shower, meaning 13 people lined up for the bathroom first thing in the morning. Everyone had their own version of how they avoided flying out of the shower as the boat rocked and rolled. There was enough hot water, provided everyone took Navy showers (midway through the trip, the captain warned of short supplies).

Though our group of eight filled up the boat, Baja added another diver without our permission. While he turned out to be sociable and a good diver, it was presumptuous of Baja to add a stranger to a boat we had chartered. Expeditions'

<i>Copper Sky and Baja Treasure</i>	
Diving for Beginners	Don't Go
Diving for Experienced	
With mantas	★★★★★
Without mantas	★★
Copper Sky Amenities	★★
Copper Sky Food	★ ★ 1/2
Baja Treasure Amenities	★
Baja Treasure Food	★
Money's worth	★ due to the weather ★★★ otherwise
★ poor, ★★ fair, ★★★ average, ★★★★ good, ★★★★★ excellent	

folks claimed he was on board to get experience to act as a backup divemaster to Mike. He claimed he was on a free travel industry FAM trip -- at our expense.

On our last morning, the Treasure, with their weather fax, warned us of an approaching storm. We decided to cancel diving and left after battening down the hatches for the dreadful ride home. We spent the last night on dry land, at the hotel (at our own expense), rather than spend another night in our cramped cabins. Expeditions' folks treated us to dinner in Cabo.

I would only go again on a boat far more comfortable (this one gets two stars, barely) with a full larder (three for the food). It's a long way to go for relatively boring diving (one star for most dives), interspersed with a few dives which, I do admit, are marvelous five star manta dives. Yet, I know people who have been out there 5 or 6 times. Yes, I saw it at its worst, so if you just gotta dive with mantas, this makes it. Otherwise, I think not.

Divers Compass: \$2695 for 6 days of diving, 10 days total trip, including airfare from San Diego or Los Angeles to San Jose del Cabo; transfers to and from the airport are included, only if you arrive the same day as boat departure and if you leave at the right time. . . .trips are run in May, October and November). . . . Bonine turned out to be the drug of choice; bring it or scop patches . . . .most nights, the captain anchored on the leeward side of whichever island we were close to, making sleeping possible. . . .I've been told of plans to put the Copper Sky in dry dock and expand her by cutting her in half, adding more cabins and moving the diving layout around. Whatever they do, she will never be a dive boat. Baja Expeditions, Inc. 2625 Garnet Ave., San Diego, CA 92109, phone 619/581-8311.

B.D.

## Failing to Get Bends Treatment

Dear Editor,

Your February 1993 article entitled "The Extra Weights We Carry," is excellent and serves well as a message that others can "learn by their mistakes".

The issue that needs to be clarified is the advice that Ms. Cheatham was given by "a doctor friend of hers who specializes in dive medicine" who told her that she was "mildly bent and everything would be all right in a few days."

All of us who treat diving cases with any regularity know that there is no such thing as a "mild case of the bends". Several articles in the diving medicine literature detail case histories of patients with "mild cases" who were not treated for one reason or another and ended up later having severe consequences. You may have done your readers a disservice by not making an editorial comment that most hyperbaric physicians would not tell a patient who was "mildly bent" to wait a few days and everything would be all right. If someone does have symptoms such as these, they should certainly seek experienced hyperbaric consultation.

The most outstanding experience I have had with this was that of a woman who was an editor of an underwater journal who was cave diving in Florida. After a deep decompression dive, she developed numbness in one finger of her hand. She realized immediately that she was bent, and presented herself

to a hyperbaric unit in Central Florida who told her that "she was too mild to be treated". She contacted me via telephone and we were unable to convince the hyperbaric unit to treat her. She waited a few days and flew back to California and, by the time she was home, her whole arm now was numb and weak. She was treated via chamber in Northern California and needed multiple treatments to finally get rid of her symptoms.

Unfortunately, the first time she went diving several months thereafter, her symptoms all recurred and at this point she is no longer permitted to dive. Had she been appropriately treated with a simple Navy VI table when she first had her problem, all of the complications, repetitive dives, and contra-indication for diving could have been prevented.

It looks like Ms. Cheatham is diving safely again, but she needs to be extremely careful on her dives. The fact that she had an untreated case of decompression sickness raises her risks for recurrent decompression sickness dramatically. She needs to be alert to slow ascents, and always have an extra long safety stop at 15 feet, no matter how shallow her dives to make sure she does not have a recurrence of her symptoms.

Tom Millington, M.D.  
Medical Director Hyperbaric Department  
Pleasant Valley Hospital, Camarillo, CA

\* \* \* \* \*

Dear Reader:

I joined a trip repped by See and Sea Travel aboard the Baja Treasure. It began with seven of us waiting three hours at the hotel for a pickup, which never happened, forcing us to finally call a cab to get to the boat.

Refurbished as a dive boat, the 115 foot Baja Treasure needs a lot more work and additional equipment. There's only one tiny, almost useless camera table on the rear main deck. The water on the deck from dripping wet suits makes it impossible to work there. Since no wet gear is permitted in the salon, it's nearly impossible to work on one's camera. Could this be why an inordinate number of cameras - including mine - and computers flooded during the trip? Tanks are new aluminum 80's, filled to 2,800 psi most of the time. On one day, the tanks contained contaminated air from oil in the compressor. While this did not make me sick, others refused to dive with this air. Located below the decks, the compressor could be heard, but never kept me awake.

The "staterooms" are adequate, each with a head, shower and sink. While the capacity is listed as 20, plus crew of six, some rooms are too small for two people, and the salon cannot seat 20 at one time for dining. Ideal would be 12-14.

The plumbing was a disaster. Sinks, toilets and shower drains backed up daily, making cabins unlivable for hours at a time - even in the middle of the night. Some people slept in the salon, and some even spent the last night - at their own expense - at a hotel in Cabo (as bad weather cut short the trip).

In contrast to the boat's pathetic amenities, the three deck crew worked hard to assist divers, helping us remove equipment, climb the ladders, and replace tanks. Tank racks are away from the dive lockers, and final gearing up must be done one or two at a time on the dive platform, which was often rocking and rolling. Moving the tank racks behind the lockers would add enough room to rearrange the deck and add camera tables.

While many dives were made directly from the back of the boat, some were made from the pangas or the inflatable Avon, which picked up divers after the dives. (Stick to the Avon; you can get bruised trying to climb into the hard-

## Cabo San Lucas

Before boarding the *Baja Treasure*, I stayed at Cabo's Plaza Las Glorias, a well established, large hotel on the waterfront - but without a beach. My Entertainment Club Card cut the room cost by 50 percent. When I declined the first room due to a long stairway, I was given a room with no stairs to climb - and a further reduced rate for the "inconvenience." Ultimately, without asking, we paid \$38 per night for a room that is normally \$110.

The room was clean, had a refrigerator, patio, and air-conditioning. The electricity is the same as the U.S., and all batteries recharged perfectly and quickly. Cabo is a "loose" Mexican version of Provincetown, at the tip of Cape Cod. There are dozens of restaurants at good prices. The most expensive was Seafood Mama's (connected with the hotel), where two of us had excellent seafood platters, soup, and a few drinks for \$40. In late November, it was sunny, breezy, air temperature in the mid 80's and water temperature around 78F.

Amigos Del Mar is the largest and best known of the dive operators in Cabo. They charge \$66 for a two tank standard dive and \$98 for a two tank "exotic" dive at Cabo Pulmo or Gordo Banks. While it is not far to walk from the Plaza Las Glorias (the closest hotel to the dive shop), store your equipment at the shop to avoid lugging it.

Amigos Del Mar caters almost exclusively to beginners. It is a follow the leader, stay close together, dive by the tables, and ignore the computers, operation. The dives were all rocks and small fish, except when a few sea lions came up to look into my mask with their big, brown, doggy-looking eyes.

The two "exotic" dives - Cabo Pulmo and Gordo Banks - were both cancelled day after day, allegedly due to winds being too dangerous for small boats and beginner divers. I suppose that by missing these two dive sites, we missed the better of the available dives, as these sites are well up into the Sea of Cortez, rather than at the tip of Baja.

P.M.

## A Leak Destroyed my Video Camera!

Dear Undercurrent,

I purchased a MPK-TRS housing with a TR-81 in August 1992. According to the owners manual, there are only "two o-rings" that require maintenance.

(1) Main body o-ring and (2) the o-ring that seals the battery compartment for the remote controls. Well, there is a third o-ring that also needs regular attention!

After three days on the *Belize Aggressor*, the system flooded! I was able to salvage it with some quick thinking by the captain. He had also had his system flood and traced it to the same problem that I had. Inside the housing on the right half is a small cover that guards the electronics that runs the controls of the camera. Inside are two electronic circuit boards, the smallest held in place with one screw. If you remove the screw and pull up on the board, you can push the lock/standby switch out and service the o-rings.

Not knowing this cost me one day of video and the repair bill was \$450 for the water damage to the camera and replacement of both circuit cards in the housing. Servicing this switch will now be a daily job.

I can't believe that Sony does not put this information into their owners manual. This is a great UW housing, compact, easy to use and only one external moving part!

*Mike Vande Lune, Des Moines, Iowa*

Dear Mike,

John Revie, Sony Marketing Manager, told us that after learning of 16 floodings, they wrote to those who had submitted warranty cards and contacted dive shops for customers who had purchased this housing, asking them to return their housing for a free inspection.

"We found a few leaks with the control zoom button and repaired those free of charge. But none of the housings indicated the problem that your reader had.

"Early in production we put an additional o-ring on the lock/standby switch to prevent leaks. We do not recommend customer removal of any of the electronics because of the potential of breaking one or more of the small wires running from the switch to the boards."

We asked how Mike's problem could be solved without opening up the electronics. Revie told us that it shouldn't have happened in the first place. "None of the other leaks appeared at this area," he said. "Factory servicing once every one or two years should handle it, but that second o-ring should have taken care of the problem.

"If your reader will call 800/398-7669 and ask for Marilyn Pott. Then, send us the housing and a copy of the repair bills for the camera, we'll pay for it."

Sounds fair enough to us.

*Ben Davison*

sided pangas in rough water.) You are free to dive your own profiles (although dives below 130 feet were not "officially" approved), go where you want, and use your computer. Some divers did decompression dives routinely. At times, the currents were vicious, and at one time or another, we were all carried far from the boat, resulting in shouting, wild hand waving, inflated safety sausages, dive-alert whistles (which were as useless in wind as was shouting)... and some panic. No one was lost, but some divers got frightened after believing they would never get picked up.

Many dives were dull, except for those with the main attraction - giant mantas. (Their arrival saved the boat from a mutiny.) We saw mantas up to 15 feet across on half the dives, and on one day, everyone who wanted could ride them. I rode one for almost an entire tank of air! They love to have their bellies rubbed, and seem to enjoy giving humans a ride. Many of us also snorkeled with mantas in the open ocean, but riding them without scuba made for an exhausting swim followed by a short ride (mantas do not stay at the surface for long).

Hard rains and storms created havoc with the visibility, made for difficult diving, missed dives, weird currents, and tough and exhausting exits into a panga and up a ladder. One diver lost his Nikonos system with a 15mm lens during a rough Zodiak pickup. Many Spare Airs disappeared. While most of us had, at best, four dives a day (sometimes only two), one old hand seemed oblivious to it all. See and Sea proprietor Carl Roessler put the kids to shame. A friendly guy with great diving stories, he got upset only one day -- when all three of his

Nikonos cameras had flooded, "forcing" him to resort to two housed SLR's. And he performed extra duty, buddy breathing a diver whose regulator had failed at nearly 100 feet up to the surface. They arrived exhausted, but safe.

We got to make only one night dive, the highlight a Synapted Cucumber, whitish, about 5 feet long, snakelike, with a head that contained about 10 smaller hydra-like protrusions. One of the thousands of marching urchins stabbed one diver through a wetsuit with a polar-tec suit under that.

Good meals can help rescue a marginal trip, but no rescue was forthcoming. Salads were noticeably lacking, and most hot meals were deep fried. Sandwiches for lunch were meager, served on plain white bread, and drowned in mayonnaise. Snacks were virtually nonexistent. Fresh fruit was always available and in abundance. Hog that I am, I actually lost weight on this trip.

While I've done shark feeding dives, Sting Ray City, and other interactive dives, my manta dives were the most spectacular. But, without the mantas, the trip would have been a bust. I can't recommend this boat at this price, even with my irreplaceable memories.

P.M.

Divers Compass: Bring backups for everything, as the boat has nothing. Even extra "O" rings for the tanks were usually of the wrong type. . . . Electricity was fine. . . .Details need attention; no library was aboard to help pass the long hours; only three bottles of red wine were aboard, and all were consumed in two nights; the bar quickly ran out of everything but beer; soda and juice were always available. . . .Booking agent Joan Clauson of See & Sea Travel was patient and helpful, and, wonder of wonders, she actually returned all phone calls and got us answers to our questions. . . .Since the trip, Carl Roessler has told us that the plumbing has been fixed and wet gear is no longer hung in the camera area. . . .Price is \$2195, plus airfare; See & Sea Travel, 50 Francisco St., San Francisco, CA 94133 (800/DIVEXPT; in CA, 415/434-3400).

## Diving Vacations with the Kids

### — Where they're safe while your underwater

Not many years ago, divers contemplating a dive vacation with their kids had to either leave the children with grandma or head to lesser diving at a Club Med, where childcare was available.

Today, as resorts recognize the trend in family travel, I've seen an increase in the number of resorts that attempt to meet the needs of family diving.

It was at *Club Med Eleuthera* in 1984 where my husband and I took our first resort diving class. It was not enjoyable — what with unsympathetic instructors, heavy sea swells and malfunctioning equipment. The intent of the diving operation was to weed out people, not encourage them, and they succeeded. Neither my husband nor I completed the course. But, our children, then 6 and 8, had scuba lessons in the swimming pool and loved every minute.

My husband and I hung in. The following year, after becoming certified through a local dive shop, we began to dive seriously. Within the first year, our travels took us to

Antigua, Cayman Brac, and Tortola.

The problem always existed, however: *What do we do with the kids when we dive?* Diving resorts were not equipped to handle kids, so my husband and I would take turns babysitting while the other dove — an unsatisfactory solution for new divers who want to share their underwater experience together.

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***"Our children, 6 and 8, had scuba lessons in the swimming pool and loved every minute."***

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In 1989, our oldest son, at 13, became certified on a vacation to Akumal, Mexico. While we still had two nondiving children, we were able to dive as often as we wanted in Akumal thanks to arrangements made by

## Contacts for Divers with Kids

The Dive Shop: 3013 Nutley St., Fairfax, VA 22031;  
703/698-7220.

Rascals in Paradise: 650 Fifth St. San Francisco, CA  
94107; 1-800-URASCAL; in CA 415/978-9800.

### Cayman Brac:

Divi Tiara Beach: Stake Bay, Box 238, Cayman  
Brac, BWI; 800/367-3484; 809/948-7553; FAX  
808/948-7316.

### Bonaire:

Sand Dollar: PO Box 262, Bonaire, NA; 800/766-  
6061; 599/7-8738; FAX 599/7-8760.

### British Virgin Islands:

Bitter End Yacht Club: PO Box 46, Virgin Gorda,  
BVI; 800/872-2392; 809/494-2745; FAX 809/494-  
4756.

### Roatan, Honduras:

Fantasy Island Beach Resort: Roatan Bay Islands,  
Honduras, CA; 800/676-2826; 504/45-1222; FAX  
504/45-1268.

### Turks and Caicos Islands:

Coral Reef Condominium and Beach Club: PO  
Box 156, Grand Turk, Turks and Caicos Islands,  
BWI; 809/946-2055; FAX 809/946-2911.

Ramada Turquoise Reef Resort and Casino: Grace  
Bay, Providenciales, Turks and Caicos Islands,  
BWI; 800/728-2248; 809/946-5555; FAX 809/946-  
5522.

Hotel Kittina: PO Box 42, Duke St., Grand Turk,  
Turks and Caicos Islands, BWI; 800/548-8462;  
809/946-2232; FAX 809/946-2877.

### Belize

Journey's End: PO Box 13, San Pedro, Ambergris  
Caye, Belize, CA; 800/541-6796; 501/26-2173;  
FAX 501/26-2397.

Rascals in Paradise, a San Francisco-based travel agency specializing in family adventure vacations.

Along with our oceanside villa came a full-time nanny — a delightful 13-year old girl whose mother was the housekeeper for the villas. The staff at *Akumal Dive Shop* provided considerable personal attention. We came to realize that one of the great pleasures of diving is to see the wonder and awe in the faces of our children as they joined our discovery of the magnificent beauty of the coral reef. Today, when we take a diving vacation, we have four certified divers.

The *Divi Hotel on Cayman Brac* has become a favorite destination. The accommodations are comfort-

able — especially if you can confirm a timeshare condo. (They will only confirm them within two or three weeks of departure — risky for a family traveling during peak vacation time.) The hotel staff has been friendly to the children and made babysitting arrangements upon request. While Cayman Brac is an outstanding destination for serious divers, I would not bring children who would tire of the beach or pool after a few hours; the real pleasures of this barren island are, of course, underwater.

A better situation exists at the *Sand Dollar* in Bonaire, where fine coral reefs proliferate. A lovely waterfront resort with a top-notch dive operation, the *Sand Dollar* offers two and three bedroom condominiums complete with kitchen facilities, living and dining rooms, even a TV. It's particularly economical, if you bring and prepare most of your own food.

The *Sand Dollar* features the "Sand Penny Club", a loosely arranged program of child care and activities including crafts, swimming and snorkeling. The front office will arrange for a local babysitter for children under six. We made arrangements with a bright, enthusiastic teenager who charmed our four-year old daughter with her games and songs. My husband and I felt comfortable diving every day with such a competent sitter. Our second son, newly certified at 13, received excellent attention from the Sand Dollar Dive Shop. Unlimited beach diving also provided our teenage divers with ample experience in clear and calm water.

At the *Bitter End Yacht Club* on Virgin Gorda, with a revamped Kilbride's dive operation, we were introduced to several staff members who babysat during their off hours. Children from six to twelve are eligible for a junior sailing program that operates every weekday morning throughout the summer. Kids can also sign up for boardsailing or snorkeling classes. While the classes usually end at noon, the dive boat may not return until 1 p.m. or later. It may take coordinating classes with sitters to make it work.

Although on the upper end price scale, the *Bitter End* offers a super "Two-Room Family Package": a two bedroom chalet or beachfront cottage for two adults and up to four children for the price of one room, plus meals. Most activities are additional.

*Rascals in Paradise* has designed a variety of tours including scuba vacations for families to travel together, sharing a "teacher/escort" who develops a program of activities just for the children on the tour. They operate "Divers with Kids" trips to Mexico, the Caribbean, the Bahamas and the South Pacific.

The *Dive Shop* in Fairfax, Virginia has been offering family weeks at dive resorts in San Salvador and Bonaire for years. Owner John Wall says, "We have tried to develop a program where we bring families together and take the time to organize activities for the children. This enables the parents to have some free time (most likely to dive) and the kids to be involved in fun and creative activities." Rather than bring an escort with them on their family diving trips, they rely on locals who bring a cultural interest and a special warmth to the program.

These Caribbean resorts offer both good diving facilities and a "child friendly" atmosphere:

## HONDURAS

*Fantasy Island Beach Resort.* Opened in 1989, this 15-acre private island is reached by bridge from Roatan. The resort has two family units, equipped with cooking facilities, a living room area and three air-conditioned rooms. In the main building, adjoining rooms can be requested for parents desiring a separate room for older children. They offer "Diver" and "Non-Diver" packages as well as a Child's Rate...all rates are inclusive of meals and there is no charge for children under four. While they have no formal program of activities for children, babysitting is available through the front desk. The local language is English.

## TURKS AND CAICOS

*Coral Reef Condominium and Beach Club* on Grand Turk (formerly Island Reef Resort) offers one and two bedroom self-catering accommodations that are ideal for a family. Depending upon the time of year, activities such as tennis, swimming and beach games can be arranged for 5-12 year olds for a small fee.

*Ramada Turquoise Reef Resort and Casino* offers a complimentary stay for up to two children, 18 years and under, when they share a room with their parents (rooms are available with two queen beds). Cribs can also be provided free-of-charge. Limited organized activities for children are dependent on the ages of the children in the hotel at the time. Babysitting can be arranged through the Housekeeping Department.

*Hotel Kittina* offers special rates for divers traveling with children, who may request studios or suites with a kitchen. They do not have any planned activities for children during the day. Babysitting is available day or

night and arranged through the Front Desk. (809/946-2232; 305/667-0966; 800/548-8462).

## BELIZE

*Journey's End*, located on Ambergris Caye, is a full service beachfront resort with a warm and friendly atmosphere. While babysitting is available, there are no special programs for children as yet. Older children requiring little supervision have ample activities to choose from—swimming, canoeing, windsurfing and volleyball. There are two 3-bedroom houses with kitchens but all other accommodations are in double and queen bedded hotel rooms. (011-501-26-2108; 800/541-6796).

## JAMAICA

*Boscobel Beach* is an all-inclusive resort modeled after the successful Club Med concept and designed for families only. The programs and activities are endless for children from two through teens. Unlike many of the family Club Meds, Boscobel also has a full-service PADI facility with one dive per day included in the package price. Diving is only average.

## CONCLUSION:

Any travel agent can arrange trips to the above mentioned hotels or you may call direct to discuss child care with them. Or, let an agency that specializes in travel for families — especially scuba travel — serve you. For a brochure, write Rascals in Paradise, 185 Berry St., #5503, San Francisco, CA 94107. Call 800/443-0799 (in California call 415/442-0799).

The author, Robin Fetch, has been diving for 7 years and involved with travel for 20 years. She is the president of Family Adventures Travel Services and editor of the quarterly newsletter *Family Adventures Travel News*. Subscriptions are available for \$25 per year by writing the newsletter at: 6535 Copa Ct., Falls Church, VA 22044.

# An End to Compressed Air Diving?

## —A new generation of rebreathers

You know that critters underwater shy away from your bubbles. Think of the turtles or sharks your bubbles have spooked. Or the fish that have fled from your lens as you exhaled.

There may be a solution — at a price. Upcoming are rebreathers, a closed circuit breathing apparatus (compared to scuba's open circuit). Exhaled gas is recirculated through a "scrubber" that removes the carbon dioxide and returns the remaining exhaled oxygen to a bag for reuse. This year at Tec.93, a meeting of technical divers held before the DEMA trade show, National Draeger, Inc. exhibited their SMS 2000. It created quite a stir, though

the initial retail price may be as high as \$5000.

Rebreathers will be of particular interest to technical divers —i.e., deep, cave and wreck folks—who have invested almost that much in what they carry on their back now for less bottom time. Gung-ho photographers will be interested. Those who like to go to areas where there are no compressors — or where there is no room to carry a compressor — will find rebreathers an advantage.

## Limitations

First developed in the early 1900's, oxygen rebreath-

## The Ultimate Test

Next year, a half-dozen cave divers will bet their lives on a high-tech rebreather, designed by Bill Stone. The U.S. Deep Caving Team, led by Stone, will tackle the vast black unknown of the Huautla Cave System in Oaxaca, Mexico, about 125 miles southeast of Mexico City.

The expedition combines the engineering challenges of space travel with the physical rigors of climbing Mount Everest. "I cannot think of any single expedition more horrendous, more difficult or more significant," said Dr. Nicholas Sullivan, president of the New York Explorers Club, an expedition sponsor.

Just to get to the point where they will need the rebreathers, the divers will spend a week lowering themselves down 40 vertical shafts on ropes, diving through flooded tunnels, and slogging through a raging underwater river.

As the pebble falls, they'll descend 4,500 feet from the surface base camp. But they will have hiked five miles, packing a ton of equipment for four months. Three thousand feet of the descent will be underground.

Then comes the hard part.

Six of the expeditions most experienced divers will strap on the rebreathers and slip beneath the underground river to grope their way into the unknown.

They hope to emerge about six miles away as the crow flies, where the Cueva de la Pena Colorads underground river emerges from the Huautla Plateau and flows into the Gulf of Mexico. But the actual distance is expected to be much greater because of the river's twisted course.

The Huautla System is a limestone plateau laced with as many holes as a sponge. The cave divers may have to feel their way underwater for up to 18 hours before they find a cavern where they can come up for air and rest. They may have to dive down 300 feet or

more.

If something goes wrong, the chances for rescue are so remote that they may as well be on the moon.

Stone, the expedition leader, is a fitness fanatic and veteran cave explorer who lives in suburban Washington. "Claustrophobic people were weeded out long ago," he said. "You have to enjoy the underground environment. You have to be intrigued by the idea of being underground for a long period of time."

Stone has been preparing to explore Huautla for more than 10 years. Previous expeditions were stymied by scuba's limitations. So Stone taught himself how rebreathers work and how to design a better one. The mission has already been postponed several times to permit the cavers to log more practice time on Stone's rebreather. The latest version is called the Mk-3R rebreather, but a fourth incarnation will be built in time for next year's mission.

While Stone is a scientific whiz—he can do complex calculations in his head—he is human. After making a lengthy descent for a cave dive, he discovered that he had forgotten his flippers.

Despite the awesome challenges of the mission, Stone and the other members of the team are struggling with some more mundane ones -- like getting enough time away from their regular jobs to train for the mission. They are also struggling to complete the mission before middle age saps their endurance. (Stone is nearing 40.)

The stakes are high. One deep diver -- not a member of Stone's team -- fell to his death in a 100 foot shaft in Huautla. Stone's group was also exploring the cave at the time and tried to recover the body, but they gave up the effort as too risky.

A version of this article, by Tom Nelson, originally appeared in the *San Rafael Independent Journal*. It is reprinted with permission.

ers were perfected for World War II and were seen extensively in those WWII frogmen films. Worn on the chest somewhat like the horse collar BC, they consist of a breathing bag filled with oxygen, a "scrubber" unit and a small cylinder of oxygen. The scrubber absorbs carbon dioxide and recycles the available oxygen. As the oxygen is used, the bag collapses. Once it reaches a given internal pressure, a mechanical valve adds oxygen from the cylinder to fill the breathing bag. Since pure oxygen limits depth to 30 feet (and some physiologists now recommend 21 feet), these units are restricted to shallow water work.

Scientific, commercial and military divers need rebreathers for deeper work; so another gas must be mixed with the oxygen-compressed air (making the breathing gas a Nitrox mix) or helium (for heliox). Since these dilutants must be added in controlled amounts to limit the partial pressure of oxygen (and the associated

oxygen toxicity problems), an electronic sensing device controls the gas breathing mixture.

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***"...a rebreather offers the diving capacity of 10 aluminum 80's for less weight than one aluminum 80 tank."***

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One advantage of a rebreather over scuba is that a diver can stay down longer and carry less weight, thanks to recycling his breath. One estimate is that a rebreather

offers the diving capacity of 10 aluminum 80's for less weight than one aluminum 80 tank. Richard Nordstrom, past president of Orca and now the CEO of CIS Lunar, a rebreather manufacturer, believes that, for certain divers, the reduction in needed equipment, particularly tanks and pre-mixed gasses, will soon outweigh the initial investment made in a rebreather.

The limiting factor with a rebreather is not the amount of oxygen or the dilutant gas but the "scrubber." As the rebreathed gas returns to the unit, it goes through a scrubber consisting of a canister of an alkaline hydroxide or superoxide filtration. The alkaline absorbs the carbon dioxide and releases the oxygen. The biggest limitation with rebreathers, says Cliff Newell, NOAA Deputy Diving Director, "is knowing how long the scrubber will work. Everyone used to talk about problems of getting the scrubber material wet and inhaling a caustic cocktail, but all that did was burn like hell. It told you to get out of the water. But with a saturated scrubber you can get a carbon dioxide build up, black out and maybe not come up."

This scrubber unit is the key both to the dive length and to the diver's safety. Ken Greene, General Manager of Carleton Technologies, told us that they can sense oxygen levels, depth, tank pressure, battery levels and the like, "but we have not come up with an adequate CO<sub>2</sub> sensor."

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***"...three companies are working on rebreathers that may come to the recreational diving market at a price of about \$5000."***

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Another problem, Greene told us, is that packing a scrubber unit is much like packing a parachute; it requires training and practice. "If not packed correctly, there can be channeling, that is where the recycled breath follows a channel rather than being dispersed throughout the scrubber unit. When that happens, the recycled breath is not scrubbed of the CO<sub>2</sub>. CO<sub>2</sub> does not have a distinct odor or flavor. If the scrubber is not working, the diver won't know until it is too late."

### **Under Development**

The US Navy uses a mixed gas rebreather called the Mark 15, manufactured by Carleton Technologies, but it is not on the commercial market. Commercial divers in Europe have been using the National Draeger unit called CRS 600 that was developed for North Sea oil exploration. Dr. Bill Stone has developed the Cis-Lunar model for cave penetrations (see sidebar). Handmade, they sell for roughly \$50,000.

Obviously, that price won't swing for sport divers, but three companies are working on rebreathers that may come to the recreational diving market at a price of about

\$5000. Carmellan Research Ltd. in England is doing design research for National Draeger's SMS 2000. Cis-Lunar is working on a fifth level prototype. And, Oceanic quietly announced, at this year's DEMA trade show, that they had acquired a license to use National Draeger's electronics in the design Oceanic is developing.

A recreational unit will most likely have the capabilities of handling nitrox mixes with a built-in dive computer. National Draeger thinks diver training will take about 50 hours, while Oceanic speculates they can get it down to 40 hours. With a rebreather, the diver must breathe all the time — no skip breathing or long pauses at the beginning or end of each breath as is common among scuba divers. If the diver does not breathe all the time, carbon dioxide will build up in his system and cause blackout.

"We do not know," says Russell Orlowsky of National Draeger, "if the average sport diver will use the equipment often enough to keep their skill level high. If we enter the sport diving market, we are looking at initial training and refresher courses. Diving with a rebreather is not as simple as diving with open circuit scuba."

Rebreather users must descend and ascend at a much slower rate than scuba divers to allow the breathing bag to gain or lose volume and for adjustment of the oxygen percentage in the breathing bag. This is a particular concern if the depth is beyond 130 feet.

This year National Draeger will be showing the SMS 2000 at several dive shows to gain some measure of consumer interest before they make a final decision. Cis-Lunar needs a cash infusion of around \$4 million from investors before their unit can be mass produced.

The only thing Peter Radsliff, Marketing Manager of Oceanic, would say is, "Our design is still on the drawing boards and our standard line of equipment will get first priority."

### **Will they make the market?**

Whether rebreathers ever gain hold in the sport diving community may depend upon the extent to which sport divers accept diving with Nitrox — a mixture that is essential for the rebreather. While forces in the diving community are fighting to keep sport diving exclusively compressed air diving, we speculate that Nitrox will gain gradual acceptance.

Yet a greater obstacle to the development of the rebreather for sport divers may be trends in the American legal system. National Draeger's Orlowsky told us that "product liability is not a problem with the military and only a slight problem with commercial diving. But the sport diving market is an entirely different matter."

The final obstacle: the price tag. Compare that \$5000 introductory price for the rebreather system to the \$1200 to \$1500 one puts out for a comparable compressed air tank, regulator and computer.

What are you prepared to pay for increased bottom time and no bubbles?

*Ben Davison*

# The Hidden Factor in DCS

## —Little discussed causes of dehydration

We can lose almost all our fat, half our body protein, and 40 percent of our body weight and still remain alive. But a 10 percent water loss is serious and a 20 percent water loss could be fatal.

Dehydration facilitates fatigue, irritability, shock, muscle cramps, hyperthermia and hypothermia. It may increase the risk of decompression sickness and be an unrecognized cause in a number of “unexplainable” bends cases.

Thirst and dry mouth are obvious symptoms of dehydration. Reduced urine output and a darkening color suggest dehydration is problematical. In a diver, it's even more problematical, because being immersed in water is, itself, a dehydrating activity.

### The Dehydration Journey

The journey begins the night before our trip, when we stay up late packing or partying. The next morning, we drink coffee or tea and experience the stress of travel. Normally, our bodies hydrate with every breath we take, but airplane air is recirculated and dehydrated. We drink dehydrating coffee, soda and alcohol.

We sweat upon arrival at our tropical destination. The welcome rum punch is dehydrating, and if we consume more protein than usual — for example, bacon and eggs for breakfast instead of a Danish — the metabolism of protein results in the production of the waste product urea and additional excretion of water from our body.

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***“...divers should drink approximately two, eight-ounce glasses of water before a dive.”***

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We lug our gear onto the boat, sit in the sun, put on our wet suits too early and come close to heat exhaustion. Seasickness, seasickness pills, and even decongestants may be dehydrating.

In the water, our peripheral blood vessels constrict, shunting blood to the body's core. The receptor in the heart interprets this as excess blood, increasing urine volume. Furthermore, immersion may increase dehydration by reducing voluntary intake of water due to decreased thirst.

Our regulator delivers cold, dehydrated air to our upper airway, where it is warmed and moistened before passing through the tracheae.

We often get dry mouth, that some instructors tell us, is a normal side effect of diving. “After all, you're breathing dry air.”

Wrong. Dry mouth means we do not have enough fluid in the uppermost airway where the process of hydrating inspired air begins. Dry mouth will not occur if we are properly hydrated. The more dives we do, the more water we need to drink.

If we do multiple dives over consecutive days, nitrogen may build up in our slow tissues. Dehydration may decrease the efficiency of offgassing and increase the risk for decompression sickness by decreasing blood and other fluids. Although this is theoretical, it is widely accepted.

Still, we tend to drink far too little water. When dehydrated, nonhuman animals will drink enough water to replace the deficit. But, many humans will endure “voluntary dehydration” if only “water” is available or if they do not like the taste of the water. And many people, even if hot and sweating, will not drink water if it's not cold enough.

### What We Need

The International Sports Medicine Institute recommends that on normal days, unless otherwise advised by your doctor, an adult should drink 1/2 ounce of water per pound of body weight (approximately eight to ten, eight-ounce glasses a day for a 150 lb person). An athletic person should drink 2/3 ounce per pound per day. Cool water, citrus flavors and cool juices all help facilitate and maintain the proper water balance.

These volumes may not be enough for divers doing multdives over multadays. At the 1991 DAN Europe International Scientific plenary meeting, Dr. Hans Ornhaugen suggested that divers should drink approximately two, eight-ounce glasses of water before a dive. And I would add, that for every glass of a dehydrating beverage, a like amount of plain water should be ingested.

Safe diving requires drinking enough water until your urine is clear and copious (just because you need to urinate when you dive does not mean you have copious urine).

And, remember: thirst and dry mouth, symptoms of dehydration, may be precursors of the bends.

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Author Andrea Zaferes is the head trainer for EMS cold water drowning and dive accident management for Lifeguard Systems. Coauthor of *Oxygen and the Scuba Diver*, she was the first woman to receive the Beneath the Sea/Underwater Society of America Diver of the Year Award for Education (1992).