

# undercurrent®

THE PRIVATE, EXCLUSIVE GUIDE FOR SERIOUS DIVERS

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## Curacao, Netherland Antilles

### *A Mecca For Non-divers And Casual Divers*

Curacao is not for gorilla divers, those frenetic folk who select their tropical dive vacations based on the number of tanks they can log in a 24-hour period. That's simply not Curacao.

Instead, Curacao is for a different sort of diver, one whose vacation must satisfy far more than his aquatic instincts, one who seeks perhaps a bit of history and a bit of charm, shopping, fine restaurants and, perhaps, a little urban stroll to offset the sunny days and tropical beaches. And Curacao especially is for one who may have a non-diving spouse with whom he or she cares to spend some time pursuing holiday delights above the ocean's surface. Indeed, Curacao is a rare destination in the Caribbean for here, on this extraordinary little island with its capital, Willemstad, looking like Holland transplanted in the Caribbean; one can take a tank or two and find pleasing, interesting, unfettered diving. But first, let me tell you of Curacao, the island, not its waters.

The oldest Dutch settlement in the Western Hemisphere, dating back to 1634, Willemstad is home to 160,000 citizens, many of whom live in tightly/knitted row-houses separated only by narrow streets. The flourishing harbor is one of the largest in the world, a source of supply for luxury imports peddled in the five-square-block Punda district. Here one may find the usual and not-so-usual imports, from cameras and watches to silver and crystal and linens. It's a shopper's delight. Outside of the shopping district one may visit a number of historical sites, including the Curacao liqueur factory, the Amstel brewery, the highest bridge in the Caribbean or the oldest synagogue in the Western Hemisphere. In the evening, try your luck at any of four gambling casinos, enjoy a big name entertainer, or dance to a large band or the latest beat at one of the several discotheques. And the restaurants? They are special here. The Chateau Suisse, Belle Terrace, Bellevue Bar/Restaurant, Bistró Le Clochard, La Bistrolelle and La Recif earn top Caribbean reviews. Reservations are sometimes required and some require a jacket. Indeed, Curacao holds quite a combination.

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Where to Stay? There are six major resort hotels on Curacao; Hotel Arthur Frommer, Avila Beach Hotel, Curacao Hilton, Curacao Plaza, Holiday Beach Hotel, and Princess Beach Hotel. Preferring smaller hotels, I chose the romantic Avila Beach Hotel. This historic governor's mansion "Pen of Belle Alliance" is furnished in old-Dutch style, with 45 air-conditioned rooms and lovely terraces with tropical plants and flowers and open air dining under rustling palm trees. Tea in the afternoon and evening cocktails are served in the delightful Schooner Bar overlooking the blue Caribbean. A private sandy beach is open for year-round swimming and barbeque parties. During my October stay the room rates ranged from \$36-\$52/day, double occupancy. Though the modified American Plan was available at an additional \$20/day/person, I skipped this feature and took advantage of Willemstad's many restaurants.

Some, such as the Chateau Suisse (located in a typical 240-year-old Dutch building) were only a short walk from the hotel. I sampled "bundnerfleisch" (thin slices of air-dried beef from the Alps) and steaming, bubbling fondues. Specialities are rahmschnitzel (veal in light cream sauce with mushrooms and noodles), tournadoes Swiss and scampi par excellence, and for the crowning touch--warm apple strudel with vanilla sauce. Service was personable and excellent.

Only two dive operators take visitors to Curacao reefs. Bert Knubben runs his shop, Dive Curacao, on the beach at the Princess Beach Hotel. Bert, who uses a seaworthy 17-foot Thunderbird to accommodate six divers, has but nine tanks. He charges \$25-\$30 for a single tank. A six-dive package runs \$150 and 10 dives are \$225. He furnished weights, belts and tanks with back packs. Ben and Eva Van Dalen operate Piscadera Watersports at the Hilton. They have two dive guides, a couple of dozen tanks, a 22-foot Aquasport carrying 8 divers, an 18-foot Custom carrying 8-10 divers and a 15-foot whaler carrying 2 divers. Both operations offer resort courses and snorkel instruction; boat dives are single tank. The Masterdive Scuba Shop in Willemstad offers PADI full certification courses, equipment sales, tank rentals and air fills and regulator repairs but does not take divers on boat dives. Owner Frank Engelhardt, with his three compressors, keeps the tanks filled for the two hotel-based operations.

Because the Avila Beach Hotel was near the Princess Beach Hotel, I chose to dive with Holland-born Bert Knubben, who has lived on Curacao since he was six. During his 15-year diving career, Bert has been a commercial diver, a hull cleaner and a dive instructor at many of the hotels. I found Bert a friendly and compatible leader--and interesting, as well. He believes, for example, that black coral can be planted then grown for commercial use at selected underwater sites and he himself is experimenting with it for his black coral jewelry business. An accomplished carver of black coral, Bert sells his exquisite work in his shop. Bert's also a lover of parrots; he keeps a dozen in his shop. His favorite parrot, Kuka, usually accompanies him and his divers on the boat trips where he keeps an eye on the divers from a perch on the bow.

Probably the most popular dive site on Curacao is the Superior Producer, a 200-foot-long steel-hulled Dutch freighter, which sank in October 1977, just outside the mouth of Willemstad harbor. She sits perfectly upright on a sand bottom in 100 feet of water. Arriving at the wreck was quite a thrill; after a short slide down the anchor line, the full length of the ship suddenly loomed into sight in the 100-foot visibility. Penetrating the hull I found was easy--and safe--all hatches were open and the hull is completely intact. She was

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carrying a general cargo--clothing, suitcases, wallets, aftershave lotion, and reportedly, cases of Rolex watches--and I reclaimed men's shirts still in their original wrappers. Small corals, sponges and black coral have begun growing on the ship and the railings are overgrown with Tubastreae cup corals. All the normal tropical fish life is here plus moray eels and barracuda.

Bert took us to the huge piling where supertankers tie up in Caracas Bay. Here one may find a number of bottles, china and other odds-and-ends from centuries of ships at anchor and, sure enough, I found a small vase while Burt himself retrieved an old Dutch gin bottle. The slope is steep and much of the findings are in water from 100 to perhaps even 150 feet. On the pilings themselves grow spiny oysters, a great variety of anemones, tubastreae cup corals and multicolored sponges. With the visibility running 80-100 feet and the sun filtering through the huge pilings, I discovered fine photographic opportunities. Cowfish, pufferfish, grey angels, 5-10 lb groupers, blonnies in the coral heads, a blue-spotted coronet fish (indeed a rare creature) and great quantities of christmas tree worms were among the plentiful marine life.

| CURACAO, NETHERLAND ANTILLES                         |   |   |   |     |
|--|---|---|---|-----|
| Diving for beginners                                 | ★ | ★ |   |     |
| Diving for old pros                                  | ★ | ★ | ★ |     |
| Beach snorkeling                                     | ★ | ★ |   |     |
| Hotel  | ★ | ★ | ★ | ★ ½ |
| Moneysworth  | ★ | ★ | ★ | ★ ½ |
| ★poor, ★★fair, ★★★average, ★★★★good, ★★★★★excellent. |   |   |   |     |

On the east side of the mouth of Caracas Bay the gradual slope drops almost vertically to more than 200 feet. Excellent coral formations abound and the diving, I felt, was somewhat reminiscent of Bonaire. I was smothered by enormous schools of creole wrasse and chromis. Morays, grey angels, many anemones, anemone shrimp, crabs, lobster, enormous feather dusters, trumpet fish, groupers, spotted drums, juvenile spotted drums and angels and a lot of black coral make this an excellent dive site.

In 15 feet of water rests the 35-foot "little tug." Having been there for more than 20 years, it is well overgrown and I viewed a large variety of marine life in the 80-foot visibility. It's an excellent place for photography and for the novice diver. All the hatches are open and I found it simple to crawl in.

Bus Stop Reef is an artificial reef which was created by lumping together two huge barges, three old buses, and thirty junk cars. Built in 1968 by the Curacao government to develop fishing, it has become encrusted with marine life and has indeed attracted many fish. Reportedly, the rare Jewel Box shell has been found there. The reef is nice and handy--only fifty yards off the Princess Beach Hotel.

Bert Knubben, an outstanding dive guide, was friendly, helpful, courteous and full of information about Curacao and the reefs. On the day we dived two tanks, Bert left his shop in the hands of an assistant and he and his wife Silvi took us for a single tank and then toured the eastern part of Curacao and Spanish Water Bay by boat. We had an excellent lunch at Jan Thiel and then dived our second tank. The four people in my party were Bert's only divers in late October; each day he picked us up and returned us to our hotel.

Coming here just after my trip to Bonaire, I expected to be disappointed. I was not. Yes, one tank is normal, and the reefs I visited did not compare with neighboring Bonaire. But then Bonaire's among the very best. Diving here was indeed enjoyable, beating many well-advertised resorts in the Bahamas and elsewhere in the Caribbean. For the time being given the limited facilities, Curacao is not for gorilla divers. But then, with all the amenities of Willemstad, it may not be long before some enterprising divemaster expands an existing operation

or creates a villa just for divers. For now, it's a fine retreat for couples who want just a little diving and a tropical vacation with an urban twist.

Diver's Compass: Make diving reservations before traveling; U.S. agent for Dive Curacao is Hotel Travel Resources, 502 Madison Ave., NYC., 10022 (212) 935-9279; for Piscadera Watersports contact Hilton Reservation Service, 415 7th Ave, NYC, 10001 (212) 594-4500....to arrange certification contact Master dives' Frank Engelhardt at Fokkerweg 13, Willemstad, Curacao, N.A. (telephone 54312)....English is widely spoken and the locals, I found, were friendly; the racial battles of 1969 seem distant history...restaurants and hotels add a 10-15% service charge, so don't tip unnecessarily....if you drop your wad at the gaming tables, you won't have enough for the \$5.75 airport departure tax.... Curacao is but 35 miles north of the Venezuelan coast...Heavy ocean chop often makes the journey to the dive sites a rough ride, though sites were all well sheltered.

## Reports From Our Readers' Travels—Part IV

DOMINICAN REPUBLIC: Charles Engles (Oklahoma City) went to the shop he saw advertised in Skin Diver, Mundo Sumbarino, in Santo Domingo. No one spoke English, but his wife (fluent in Spanish) arranged the dive for \$40 per person, which included renting two tanks and being driven to Ocoa Bay where they dived alone, since no dive guide showed up at the shop for two days in a row. They found few fish, average to fair corals, 35-foot visibility.

FIJI: Mana Island is a wonderful resort for tropical relaxation with a pretty fair wall though Steve Cohen (NY) says, "The wall is not as spectacular as Cayman North Wall; coral more drab and few large sponges and plenty of pelagics, including several shark varieties. Inside the reef are fine variety of reef fish--lionfish, morays, etc. Harold Moser (Bellevue, WA) wrote that last April only one-tank boat dives were offered because the compressor had been badly damaged in a hurricane. We presume the problem is now rectified.

FLORIDA: As an underwater park Pennekamp offers a fine array of corals and fish, including squadrons of large barracuda and schooling grunts. Maximum depth is about 30 feet, visibility runs from 30 to 100 feet and distance to the reef is about ten miles in speedy charter boats. Many readers complain of too many divers and factory-like charter operations. Ken Sherman (Toronto) complained that Key Largo Diving Headquarters promised good sites but took him to others and he did not feel he got his money's worth. Jim Williams (Blue Springs, MO) found the Triangle Dive Center at Howard Johnson's a "we try harder operation. What they lack in big organization they make up for in enthusiasm. The captain/dive guide loves the Park and it shows. I've never in 16 years of diving seen so much sheer concern for my dive enjoyment."....Jim Henry, (Sarasota, FL) likes the Tropic Isle Dive Shop in Key Largo where "the operators are knowledgeable and courteous. The crew were helpful, pleasant, informative and certified divers who made themselves known, received special assistance if requested." On the same trip Henry tried American Diver and said that one crew member "treated experienced divers as novices and novices as children. Though other crew members were helpful." But he found the dive boat "slow, rather crowded, disorganized and inconsistent.".... Key West is a resort town (for straights or gays) but the underwater scenery in no way matches what one can find in Pennekamp. D.W. DuFour (Chico, CA) likes the Key West Pro Divers. "They're the best shop in the Keys." John and Holly Dees tried the Reef Raiders in Key West and said they found it geared for vacation divers with too many rules." In Marathon, Richard Weiss (Mississauga, Ont.) said in the thirty years he's dived the Keys he prefers the diving at the Coral Lagoon Resort, which is close in proximity

to Looe where he saw 8-foot spotted rays, sea turtles, numerous barracuda. "For old pros, the three-day trip to Cay Sal was super, with plenty of big fish, drop-offs, and clear water. Captain Bob Tillman (The Bugaloo) and Captain Charlie Phinizy (Coral II) are helpful and knowledgeable in every way. Willing to go to any site in the area which pleases you."

GRAND CAYMAN We've gotten fewer responses on Grand Cayman this year than in the past. Are fewer divers travelling there? Divers complain that diving off Seven Mile Beach is deteriorating (no permanent moorings are in place for dive boats, so more and more coral is crushed.) The Holiday Inn on Grand Cayman is, as one diver wrote, "The poorest excuse for a luxury hotel. Very dirty, total lack of management concern, no hot water. Horrible." Don Hamilton (Sterling Heights, MI) simply said of the food, "Ugh." This Inn is not part of the American chain and that's why it's substandard. Bob Soto's operation (now owned by Ron Kipp), a classic example of the "cattle boat" concept, takes scores of divers to the reef every day...William Carson (Washington, D.C.) said, "The boats are excessively crowded; their shop seems more concerned with maximizing income than with providing services. One morning dive cancelled on short notice to use dive boat for ferrying the passengers from cruise ships." One reader who didn't include his name said, however, that he was pleased with Soto's operation. They were picked up on time every morning, except one, and that the staff was friendly and capable, taking them to decent sites less than a half hour from the hotel on Seven Mile Beach...Peter Milburn, (Dive Cayman, Ltd.) is, according to Dan Hamilton, "one of the greatest dive masters around. Very courteous, takes you to fabulous dive sites, fair prices. He carefully checks certification and gives you a good quick check out before diving." John Kreutzberg writes that Milburn "picked us up at our own beach each day and provided not only good diving and dive sites, but interesting critters during the dive. He is competent, responsible.

## Dear Undercurrent

### *You Are A Leader—Act Like It*

*Dear Undercurrent,*

*Undercurrent is my favorite scuba publication, but I was shocked and disappointed to read your travel editor admit (Cuba, January, '82) to thousands of readers that he exceeded the limits, skipped breathed, and generally "broke every rule in the book." Not everyone who reads your publication will be able to evaluate that information and deal with it properly. Many may use poor judgment as well. These were life threatening activities!*

*You are a leader and a guide—act like it. I would never buddy with that crazy person. I'd be safer diving alone.*

*Joan Conklin, Padi Instructor  
Alton, Ill*

Dear Joan,

Well, you're right. Now and then just about every experienced diver pulls a few tricks underwater that, after reconsideration, weren't very wise. So do our reviewers, and we suppose they'll continue to commit similar indiscretions in the future. We don't intend to encourage these activities, but then again we intend to report our trips just as they happened—with the errors, the craziness, the stupidity and all.

We have presumed our readers are well-enough trained to know when we're breaking the rules and that they'll "do as we say, not as we do." A review of our survey of diver certification (October, 1981), however, suggests that a goodly number of certified divers don't know their clasps from their elbows when they graduate.

So, we'll make it a little more clear in the future that our readers shouldn't play follow the leader—particularly if our writers are doing the leading.

C.C.  
Travel editor

and fun. His flattop typically holds twelve, so it's uncrowded." Frank Davies, Scuba Tours International, says that "the two best divemasters in the islands are Peter Milburn and Athlee Evans." We liked Evans when we dived with him three years ago at Spanish Bay Reef and now that he runs Quabbin Dives, Ltd. he is performing just as well. Arthur Card (Manchester, N.H) said, "When we asked Athlee for a trip to the North Wall he responded with a check-out dive to 100 feet for all the divers, then he took us to the Wall, which he knows as well as you know your own neighborhood. In fact, other dive boat operators call him on the short wave to ask how to find the sites. I can't say enough about Athlee." ....Cayman Kai, a condominium resort on the north side of Cayman, provides access to the better Cayman diving. Guides here are relatively conservative. Michael DeMello (NYC) wrote that after reading an article in *Skin Diver* about the beauty of wall diving to 120+ feet, he was disappointed that at the Kai dives were limited to 90 feet, though it was a "super-professional dive operation, safe, clean, and considerate." A 12-year Navy diver who did not include his name said that five-minute stops at 10-foot intervals were mandatory on each dive which, "considering the condition of most of the divers seemed reasonable. No dives deeper than 90 feet were allowed or actually necessary."...The Cayman Diving Lodge (once Bob-Soto's) seems to have been improved substantially. Though it's spartan--very spartan--it's relatively inexpensive and has access to excellent sites on the Northeast and East end of the island. Larry Nienow (Davie, Florida) said, "The food was stupendous (locally grown turtle steak, spare ribs and so forth), the wall diving fantastic, and Jerry Hytha, the owner, was a fine guide who led the wall dives and night dives."...The Casa Bertmar continues to get mixed reviews. Some love it, some don't. Nearby diving is not as fine as north wall diving. Bill Dignan (San Bruno, CA) said, "The hotel is not a dump, but it's not elegant and it's closer to a cheap motel. Food varied from good to very good. I always feel safe, never herded and respected once I prove myself to the guides. Steve Schermerhorn (Denver) complained of the closely monitored dives even though their group was highly experienced. Jean Tores (NYC) found the diving overrated and the reefs over-dived and was "disappointed there was no beach snorkeling; the reef's too far out." Ann Hueber (Spokane, WA.) said the hotel was not in the best of repair. The food was average, with little variety." Nearby is the Sunset House, a bit more luxurious than the Casa Bertmar, but it doesn't seem to be living up to its greater potential. W.H. Nickel writes, "The resort was expensive, misrepresented (no pool, no beach, poor food, no shore diving, disinterested staff); not a place for experienced divers and a sad introduction for novices." Emil Nelson (Ohio) liked it very much better than Nickel but complained that the contrived formality was unnecessary; "I had read Cayman was the sponge capital of the world but was disappointed. Other than that, I really enjoyed it." Robin Humphrey (Houston) said the diving was good "but assembly-line style was disappointing."

## How Accurate Is Your Depth Gauge?

### *Two Studies Cite The Problems*

Many divers presume their depth gauge, when new, will read out accurate depths, no matter how deep it goes. For many gauges, that's simply not true. And once a gauge is battered around a bit, the accuracy can be further affected.

Two studies have recently been published which reveal the problems of depth gauge accuracy. The first was conducted by Dr. Robert Leahy and Dr. Peter Finch, Temple University (Philadelphia) faculty members. It has appeared in the *PADI Dive Industry News*, but the accompanying chart did not appear. We are providing the chart so that readers can

see actual discrepancies between individual instruments. Because the sample is so small, no valid comparison can be made between the gauges of various manufacturers.

The second study was conducted by the British Sub Aqua Club and reported by the Club's Chairman, Mike Todd. Most of the gauges tested were manufactured in countries other than the United States. The point of the study is not to compare gauges of individual manufacturers but rather to assess the overall accuracy of depth gauges.

## THE TEMPLE UNIVERSITY STUDY

To get you through a dive safely you must rely on your watch and your depth gauge for calculating no-decompression dives and for using the decompression tables. These two essential pieces of equipment cannot be replaced by decompression meters. If either instrument is inaccurate a serious problem could result.

We became interested in assessing the accuracy of the depth gauges currently being used by recreational divers, so we asked members of two Philadelphia-area diving clubs to test their depth gauges. These are the results:

### Method and Procedures

Thirty recreational depth gauges currently being used from a variety of manufacturers were individually immersed in a beaker of water to simulate actual diving conditions and placed in a recently calibrated C.G.S. Scientific Corporation Hyperbaric Chamber. The chamber sides are clear plexiglass

which allow the investigator to read the gauges at each incremented depth. The data was recorded for each gauge at the following equivalent depths of sea water; 6, 18, 24, 36, 54, 72, 90, 108, 120 and 150 f.s.w. (feet of sea water.)

### Results

The results proved quite variable, with the majority of the gauges being accurate within a range of  $\pm 3$  feet. Most of the gauges that were not precisely of the calibration line varied on the "safe side." Although this provides a safety margin for interpreting the dive tables, it also demonstrated that virtually no oil-filled gauge is suitable for determining decompression stops. It would seem that a capillary gauge would be the required instrument for accurately assessing depth in shallow water.

Overall, the oil-filled gauge read slightly deeper than the true depth. Fourteen of the tested gauges had readings on the so-called "safe side," which was within three feet of the true depth. Four additional gauges also erred on the safe side, but possibly too

Temple University Study

| Mfg            | Year | #Dives | 10   | 20   | 30   | 40   | 50   | 60   | 70   | 80   | 90   | 100  | 110  | 120  | 130  | 140  | 150  |    |
|----------------|------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| Dacor (13)     | ?    | 100's  | +7   | +8   | +10  | +9   | +11  | +14  | +15  | +17  | +16  | +15  | +15  | +15  | +15  | +15  | +12  |    |
|                | 1976 | 100's  | (-1) | (-1) | (-1) | (-1) | -    | -    | +1   | +2   | +3   | +3   | +4   | +3   | +5   | +5   | +5   |    |
|                | 1978 | 60+    | +4   | +4   | +4   | +3   | +4   | +3   | +5   | +5   | +3   | +4   | +4   | +4   | +7   | +8   | +13  |    |
|                | 1979 | 50+    | +4   | +9   | +10  | +12  | +12  | +13  | +13  | +12  | +12  | +11  | +13  | +12  | +12  | +10  | +8   |    |
|                | 1979 | 50+    | +1   | +1   | +1   | +1   | +2   | +5   | +6   | +5   | +4   | +5   | +6   | +5   | +5   | +5   | +5   |    |
|                | 1979 | 50+    | +1   | -    | -    | +1   | +1   | +1   | +2   | +3   | +5   | +5   | +5   | +6   | +8   | +8   | +6   | +5 |
|                | 1979 | 50+    | +1   | -    | -    | +2   | +5   | +4   | +4   | +5   | +6   | +7   | +8   | +8   | +9   | +9   | +10  |    |
|                | 1979 | 30     | -    | +2   | -    | -    | -    | +1   | +1   | +1   | +2   | +3   | +3   | +4   | +6   | +6   | *    |    |
|                | 1979 | 20     | -    | -    | +2   | +3   | +4   | +6   | +7   | +9   | +6   | +7   | +10  | +12  | +12  | +12  | *    |    |
|                | 1980 | 20+    | -    | -    | -    | +1   | +1   | +2   | +3   | +3   | +4   | +5   | +4   | +3   | +4   | +5   | +5   |    |
|                | 1980 | 5      | -    | +2   | +1   | +2   | +3   | +4   | +5   | +6   | +4   | +8   | +7   | +7   | +9   | +10  | *    |    |
|                | 1981 | 20     | -    | -    | -    | -    | +1   | +2   | +2   | +3   | +3   | +4   | +4   | +5   | +6   | +7   | +7   |    |
|                | 1981 | 15-20  | +5   | +5   | +5   | +5   | +5   | +5   | +5   | +5   | +4   | +4   | +3   | +4   | +5   | +6   | +8   | *  |
| White Stag (1) | 1978 | 50     | +4   | +3   | +2   | +2   | +2   | +2   | +4   | +3   | +3   | +3   | +2   | +3   | +3   | +3   | +3   |    |
| Sherwood (1)   | 1981 | 5+     | -    | -    | -    | +1   | +2   | +5   | +6   | +5   | +3   | +4   | +5   | +4   | +4   | +5   | +5   |    |
| Farallon (4)   | ?    | ?      | -    | +1   | +1   | -    | -    | -    | -    | -    | (-2) | (-2) | (-3) | (-3) | (-2) | (-2) | (-2) |    |
|                | 1979 | 100+   | -    | (-1) | (-1) | -    | (-1) | (-1) | -    | (-1) | (-2) | -    | -    | +1   | -    | -    | (-2) |    |
|                | 1980 | 20+    | -    | (-1) | (-2) | (-1) | -    | +1   | +1   | +1   | +1   | +1   | +1   | +2   | -    | (-1) | (-2) |    |
|                | 1981 | 20+    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |    |
| Scuba Pro (3)  | 1971 | 300+   | -    | (-4) | (-4) | (-5) | (-5) | (-5) | (-4) | (-4) | (-2) | (-2) | (-2) | (-1) | (-1) | -    | *    |    |
|                | 1976 | 100    | (-2) | (-2) | (-2) | (-3) | (-2) | (-2) | (-3) | (-3) | (-3) | (-3) | (-1) | +2   | +2   | +2   | +2   |    |
|                | 1978 | 100+   | (-4) | (-5) | (-4) | (-4) | (-3) | (-3) | (-3) | (-3) | (-3) | (-2) | (-2) | (-2) | (-7) | (-7) | (-9) |    |
| U S D (4)      | 1976 | 80     | -    | -    | -    | -    | -    | -    | -    | (-1) | (-2) | (-2) | (-2) | (-4) | (-4) | (-4) | (-4) |    |
|                | 1978 | 40     | -    | -    | -    | -    | (-1) | (-1) | (-1) | (-2) | (-2) | (-2) | (-3) | (-3) | (-3) | (-3) | (-3) |    |
|                | 1980 | 10+    | -    | (-1) | (-1) | (-1) | (-1) | (-1) | (-1) | (-1) | (-1) | (-1) | (-1) | (-1) | (-2) | (-2) | (-2) |    |
|                | 1981 | 10+    | (-2) | (-3) | (-2) | (-3) | (-2) | (-1) | (-1) | -    | -    | -    | -    | -    | -    | -    | -    |    |

"-" without a number means there was no difference between the gauge reading and the test instrument.

"+" followed a number means that the gauge read deeper than the test instrument and is on the "safe" side.

"(-)" with a number means that the gauge read shallower than the test instrument and is considered an "unsafe" effort.

"\*" off scale.

safe, being off by as much as 10-15 f.s.w. A second group of eight gauges proved extremely accurate, paralleling our calibrated Helicoid Gauge with no measurable difference in reading.

The last category includes those depth gauges that were inaccurate to the level of being dangerous. The error would allow the diver to think that he or she was at less depth than the true depth. Four gauges fell into the category, one gauge erring by twenty feet, however, the other three gauges were within three feet of the standard true depth as defined by our study.

We also knew the approximate ages of all of these gauges and with the exception of only one (fresh out of the box) the rest had been in use at least one year. The oldest gauge had been used for thirteen continuous years and proved to be one of those exhibiting a large error; it was immediately retired. In general it did seem that the older the gauge the more likely it would demonstrate an increasing degree of inaccuracy, but this impression did not prove to be statistically significant.

### Discussion and Conclusion

The data collected in this research clearly demonstrates that the majority of the recreation depth gauges tested from these two sports diving clubs were accurate to within  $\pm 3$  f.s.w. Those few gauges that erred on the unsafe side do concern us as they should every diver. Only one gauge in thirty had a major error on the dangerous side.

### THE BRITISH STUDY

The British Sub Aqua Club tested 610 depth gauges being used by divers in the British Isles. Their results showed that only 22% were "really accurate," which was defined as being in error by less than  $\pm 1.6$  feet. In their survey, 38% were deemed "acceptable," that is accurate within  $\pm 6.6$  feet. Of the remaining 40%, 8% gave readouts deeper than 6.6 feet of the actual depth, while 32% read 6.6 feet or less than actual depth—"dangerously shallow." In the words of Mike Todd, BSAC Chairman, "The BSAC concern is that divers use their depth gauge for decompression and by doing so, a large number of divers would be decompressing at stops too shallow, and can put divers into entirely different decompression schedules.

The gauges tested were SOS (365), Spirotechnique (43), Farallon (37), Typhoon (35), Scubapro (29), Allemano (14), Precisa (14), Polaris (14), Metri (8), GSD (8), and Others (43). Most are not available in the United States and since 59% were SOS, the data no doubt is skewed towards SOS accuracy (or inaccuracy). Regardless of the gauges tested, for American divers, the point should be clear. There is a great chance that a depth gauge is inaccurate, and in

### BSAQ Depth Gauge Test Results

|                     | Error               | No. of Gauges | Per cent   |
|---------------------|---------------------|---------------|------------|
| <b>All Gauges</b>   | $\pm 1.6$ ft        | 130           | 22         |
|                     | $\pm 1.6$ ft-6.6 ft | 234           | 38         |
|                     | +6.6 ft or more     | 49            | 8          |
|                     | -6.6 ft or more     | 197           | 32         |
|                     |                     | <b>610</b>    | <b>100</b> |
| <b>Under 1 Year</b> | $\pm 1.6$ ft        | 34            | 31         |
|                     | $\pm 1.6$ ft-6.6 ft | 46            | 42         |
|                     | +6.6 ft or more     | 4             | 4          |
|                     | -6.6 ft or more     | 25            | 23         |
|                     |                     | <b>109</b>    | <b>100</b> |
| <b>1-2 Years</b>    | $\pm 1.6$ ft        | 36            | 23         |
|                     | $\pm 1.6$ ft-6.6 ft | 64            | 40         |
|                     | +6.6 ft or more     | 17            | 11         |
|                     | -6.6 ft or more     | 42            | 26         |
|                     |                     | <b>159</b>    | <b>100</b> |
| <b>Over 2 Years</b> | $\pm 1.6$ ft        | 60            | 18         |
|                     | $\pm 1.6$ ft-6.6 ft | 124           | 36         |
|                     | +6.6 ft or more     | 28            | 8          |
|                     | -6.6 ft or more     | 130           | 38         |
|                     |                     | <b>342</b>    | <b>100</b> |

a large percentage of depth gauges the inaccuracies can indeed be dangerous, either by causing a deep diver to believe he is shallower than he actually is (and thereby permitting him to erroneously take more bottom time) or by causing a diver who is decompressing to believe that he is at the right level when, in fact, he is significantly more shallow, (and therefore not decompressing fully).

As the chart shows, Todd tested new gauges, relatively new gauges (gauges between one and two years old) and gauges older than two years. He writes that "the greatest worry has got to be that 23% of the new gauges tested were reading dangerously shallow." As gauges grow older and, presumably were used (or kicked around) more, their accuracy substantially diminished.

### Undercurrent Comments

In neither study did the authors make any effort to determine how divers treated their individual gauges. No doubt, if a gauge is given rough treatment—i.e., dropped, packed loosely in a dive bag, left in the hot sun or otherwise mistreated—it can lose its calibration. Furthermore, since the individual gauges were not tested when they came off the dive shop shelf, there is no way to determine how far they deviated from their original setting, which itself may not have been accurate. In fact, we will soon publish a forthcoming U.S. Navy study on depth gauges which, we have learned, will reveal that many new and expen-



sive gauges are sufficiently out of calibration upon purchase to fail U.S. Navy standards.

Depth gauges should be calibrated annually. Many shops can handle that for divers, either with their own hyperbaric chamber or by sending the gauge to a specialist. And even after a gauge is calibrated, give yourself a margin of error in deep dives and decompression stops. As the studies show, even new gauges can be out of calibration or knocked out of calibra-

tion quickly. So, why take a chance?

If your dive shop can't handle gauge testing and calibration, you may send your gauge to Professional S.C.U.B.A. Repair, 5725 Cahuenga Blvd, North Hollywood, CA 91601; (213) 769-1484. Proprietor Al Thompson says they will service your gauge in 3-5 days and the cost, for testing, calibration, and COD charges will be in the neighborhood of \$25.

## Settling Dive Accidents Out Of Court:

### *Three Cases Where Guilt Is Not An Issue*

In our January issue, we carried an article on Why Dive Accidents are Settled Out of Court: Guilt and Innocence are not the Issues. Though it is often difficult to gather much information about out-of-court settlements because the parties frequently agree not to discuss the settlement, we've been able to get information on three recently-settled suits, two involving deaths during training and the third brought by a seriously injured diver who claimed he had relied upon the SOS decompression meter, sold by Scubapro.

An August 10 AP dispatch describes the first case: "The family of a Georgia doctor who drowned last year while diving in a North Florida sinkhole has received a \$1.65 million out-of-court settlement in a negligence suit filed against the Atlanta YMCA. The suit claimed that the Atlanta club was responsible for the death of Dr. Gerald Wadsworth and the near-drowning of his son, Gerald Jr., as they and six other YMCA scuba diving students made their final class dive in the Blue Grotto sinkhole southwest of Gainesville, Florida.

"YMCA lawyers said the accident was 'an act of God.' The case file also shows that the association contended that Wadsworth and his son contributed to their own injuries through their own negligence and that they knew the dangers and nonetheless participated.

"Wadsworth's widow charged that the organization 'negligently sent eight students into this dark,

cave-like grotto with only one instructor. . . Many of the group were terrified. . .

" 'At least one of the group had reached the point where he was unable to control his emotions and had to be brought to the surface. . . (The instructor) negligently left the student divers without a light below in order to take the one diver to the surface,' the suit said.

"The doctor and his son 'became disoriented and unable to breathe due to the automatic rapid use of air during the panic situation which developed, and as a direct and proximate result of such negligence, Gerald E. Wadsworth, Sr., died in the Blue Grotto and Gerald E. Wadsworth Jr., almost drowned,' the suit said."

.....

In the second case, a \$1.8 million wrongful death suit, brought in behalf of Shahanm Vjeh, who drowned during a scuba class, was settled for \$122,500. The defendants were the College of San Mateo (California), which sponsored the course, two diving instructors, NAUI and PADI.

*Undercurrent* could find no one who would speak on behalf of the defendants, but the plaintiff's attorney told us that the basis for the suit was negligence and "breach of warranty," i.e., the implied warranty of the student "being cared for and taught under supervision...adequate supervision."

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Vijeh died after completing a free ascent with his air turned off and his weight belt dropped. The suit claimed that the instructor left Vijeh after he had completed part of the ascent to return to the bottom for another student. Vijeh then apparently held his breath and embolized.

The suit contended that the open water instruction was not being taught according to the standards developed by either agency and therefore the agencies were negligent in supervising their instructors.

The suit also contended that Vijeh should not have been taking the open water test since he had failed the midterm, and the written exam, and the pool final conducted prior to the open water checkout. On the day of his death, Vijeh failed to complete the test for clearing his mask, but was permitted to participate in the next part of the check out—the free ascent. Vijeh, an Iranian, had failed two exams in English, and there was doubt as to whether he could follow the instruction.

## Diving Accident Network Begins 2nd Year

### —Treatment Advice From Any Telephone

Recently a scuba diving student in Texas made what appeared to be a normal ascent from 25 feet after spending 15 minutes below the water's surface. But he then lost consciousness and began having convulsions.

After it was determined that there were gas bubbles in the pericardium and other tissues, the diver was rushed by military helicopter to the hyperbaric chamber at Brooks Air Force Base in San Antonio, Texas, 130 km away. After treatment, the patient appeared to regain most functions and was enrolled in physical therapy.

Anyone who dives should know the location of the nearest hyperbaric chamber. That kind of information, as well as other emergency consultation advice, now is available through "DAN"—the federally supported National Diving Accident Network. The network, which begins its second year of operation next month, is administered at Duke University Medical Center, under an initial two-year, \$270,000 grant from the National Oceanic and Atmospheric Administration, National Institute for Occupational Safety and Health, and the U.S. Department of Energy.

Consultation from DAN according to Arthur Dick, MD, assistant medical director, is provided in the following way:

Anyone needing emergency assistance in a scuba-related accident telephones (919) 684-8111 (collect if need be) and specifically asks for the diving accident network. He is connected with one of the physicians on call 24 hours a day under the direction of John N. Miller, MD. The physician either advises the caller directly or assists him in contacting the regional director of one of the seven multistate regions (Northeast, Southeast, Midwest, Gulf, Northwest, Southwest, or Pacific) each of which has chambers available around the clock.

The regional coordinator assists with transportation and treatment arrangements. After the diver is treated, the coordinator sends a record of the case to Duke, which conducts an epidemiologic study of the location, frequency, diagnosis and treatment of diving accidents in the United States.

Duke physicians emphasize that this service "is not designed to replace existing treatment organizations already active, but to involve them in the network so that patients may be more effectively directed" to them. A treatment manual can be purchased for \$3 from DAN, P.O. Box 3823, Duke University Medical Center, Durham, NC 27710.

*This article, by Phil Gunby, recently appeared in the American Medical Society's Medical News.*

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Attorney Gayle said they accepted the out-of-court settlement because "it was a good one," and there was no guarantee of a greater return should the case go to court. Gayle pointed out that Vjeh was Iranian and with the suit coming one year after Iran took the American hostages, he did not feel comfortable bringing the suit to a jury in what he believed to be a "conservative" country.

The suit was complicated because the trip to Monterey was not an "official part" of the CSM class, the college instructor was not present, and another instructor was conducting the class. Since the death, the College and the entire school district has ceased offering courses.

\* \* \* \* \*

In 1978, we received a letter from Malvin Gillin, a Honolulu attorney. He wrote:

"I represent William J. Westermeyer, who suffered the bends in January of 1977. Mr. Westermeyer at the time of the accident, had used and relied upon the SOS decompression meter which is referred to in your article. Indeed, at the end of Mr. Westermeyer's dive, the decompression computer indicated that no decompression was required and Mr. Westermeyer relied upon the meter to his detriment. Mr. Westermeyer required four separate treatment encounters at the Pearl Harbor Naval Recompression Chamber in Honolulu, Hawaii, and was thereafter hospitalized for about three weeks. Mr. Westermeyer has suffered a permanent partial paralysis of his urinary bladder and continues to experience some difficulty in the control of the motor function of his legs."

We have written, from time to time, about how the SOS meter dial does not parallel the U.S. Navy decompression tables (nor, for that matter, any widely accepted decompression tables) for deep, single dives, and for many, perhaps a majority of, repetitive dives. Attorney Gillin referred to our articles in his letter. We recently called him to determine the outcome of the suit. He told us it had been settled out of court, the settlement was "satisfactory," but that the agreement stipulated that neither he nor the plaintiff could discuss the settlement.

That kind of arrangement, of course, means that should anyone in the future bring a similar suit against the SOS meter, which is distributed by Scubapro, they will be unable to rely on this settlement either for information or as a precedent.

\* \* \* \* \*

Finally, we should add this note received from Ronald Young, Vice-President of Anderson and Anderson, Insurance Brokers:

"I'd like to compliment you on your factual and well written article on settling dive accidents out of court. As you know, I personally am very active in the sport diving industry for all types of insurance protection. In fact, I personally wrote the first Instructor's Liability policy and am proud to say that PADI, SSI, NAUI and NASDS today all use my exact insuring agreement. Keep up your good work. I believe the information you offer is very informative and not negative, as some people fear."

## The Diver's Dark, Dangerous Search

### —The Grim Hunt For Flight 90's Victims

Life ends at the ladder when the brown water full of sullen rainbows from the diesel fuel rises over the rubber boots, the uni-suit, the Navy Mark-12 diving gear, the yellow plastic Kirby Morgan helmet.

Life, right here, is the grumble of the Navy landing craft engines, the pigeons circling under the 14th Street Bridge, which connects Washington to Virginia, the empty black body bag waiting above the ladder, the photographers leaning tiny over the railing to watch the helmet sink. The other divers stalk around hefty in their red neoprene leggings. On the riverbank is the hard scramble chaos of any disaster area. The disaster here is the crash of Air Florida Flight 90, Wednesday, January 13.

The helmet eases below the surface, with the water climbing up the face mask in a dirty, jagged horizon. The water blisters with bubbles, and then it's the netherworld, a sensory-deprived solitude where everything seems to be happening in the mind. There's the hollow grate of voices from the surface

over the communication system, and the odd grinding whine of propellers from the boats pushing through the ice overhead. Then the soft, dead clutch of the mud at the boots—no need for flippers, here, no flying weightless in three dimensions, the way it is on television.

"It's crawling in the mud, is what it is," says William Herren, Sr., divemaster of the Montgomery County Fire and Rescue Services, and a firefighter in Sandy Spring. Herren was part of the team diving at the crash site on Thursday and Friday. "It's not pleasant. You're very disoriented. You have to do everything by feel—like a blind man getting used to his house. The cold isn't that bad—you wear a Poseidon uni-suit or a Henderson dry suit over thermal underwear. Your feet freeze first, then your hands, and you can't feel that much to start with—you're wearing three-finger rubber gloves. The wreckage is the biggest danger—you can foul and get hung up. You have to have good control of yourself,

and training and experience. You only have to mess up once. Usually divers are kind of crazy."

If death had infants, they'd be the divers crawling in the mud under as much as 30 feet of river to retrieve Flight 90—the victims, the chunks of plane sprawled across the mud, the shoes (so many of their shoes came off at impact), the clothes, the trash.

Not only infants but blind ones: "The visibility is close to zero," says Coast Guard Commander Mike Taylor, who is head of the National Strike Force Diving Team, which made its first dives Thursday afternoon, a day after the crash. "Lights will only expand the visibility field about an inch."

Two Navy salvage and harbor-clearance teams are working with Coast Guard-supervised divers from Army engineering units. There are no more amateurs piling into the water in scuba gear the way they did when the plane first went down. The air now comes from hoses to the surface, lest the ice on the river jam open the regulators on air tanks. Supervisors watch the trails of air bubbles and keep the lines taut, to avoid kinks and fouling. The riverbank is covered with Army officers, Navy officers, police officers. But no amount of brass and organization can change what's down there in the rocks and mud.

Everything goes so clumsily. It is as slow and strange as a dream of falling or being chased, when nothing works right, your arms won't grab, your legs won't run. Rubber hands touch. . . fuselage? ceiling? a seat? Something soft, maybe a cushion, and then no give where there should be some—the arms frozen bent where they rested on seat arms, the head pitched forward and frozen there. If the seat is upside down, the arms will be over the head, set in the sort of pose a man might be in if somebody was handing a baby to him. Rubber fingers feel for the seat-belt buckle, and pry it outwards. Then the body, knees still flexed slightly, about like the knees of a golfer making a shot, have to be worked out of the seat. It's not heavy—a body doesn't have much weight in the water, and may even be a little buoyant if there's any of what's called "tidal air" left in the lungs. But it's clumsy, it drags, it catches on torn sheet metal.

"I've got one," the diver may say. And then he crawls back toward the lift on the front of the Corps of Engineers boat, hauling the body through the mud by a limb or a rope. If he has to, he can add air to his suit for added buoyancy.

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*"There's no visibility. It's the Braille method only. It's like being in a dark room with your own thoughts. You have to try and remember which way you went, but you have to remember it in three dimensions."*

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Man, woman, old, young, hair streaming against the current, eyes open or shut, there's no way of knowing this procession under the river ice.

"It's grim at best," says Terry Robinson, a geophysicist and a former SEALAB III aquanaut who trained in the winter in the Anacostia River, and is now retired on disability from the Naval Oceanographic Office. "There's no visibility. It's the Braille method only. It's like being in a dark room with your own thoughts. You have to try and remember which way you went, but you have to remember it in three dimensions. You're trying to control your body. You say, 'Body don't hurt, while I'm doing something important.' You can get tangled in your own lifeline, you can get caught in tangles of wire and tree branches, and the reinforcing bars construction workers throw into the river when they're building bridges."

Wreckage, Robinson says, doesn't settle "in an ideal situation. You can be walking on a wall and fall through a door. It gets really confusing."

If they're blind infants, they're also death's own midwives, bringing the people on Flight 90 out of the cold jagged womb.

Back on the surface, where the air shakes with jets climbing over the 14th Street Bridge and people keep looking up at them, this being one of the reflexes of life at the crash scene, a Corps of Engineers boat lowers its front platform into the water. A member of the diving team holds the air and communication lines and walks them along the dividing platforms.

The bubbles shine bigger and bigger on the water, and then it is, say, the knee and the elbow, then the bright frozen coin of face lifting into the air, borne supine, with the brown river sagging away from the sweater and slacks. It is a man in his thirties, with a look of preoccupation on his face as if someone has asked him to multiply two big numbers in his head, and he'd close his eyes and jutted his jaw to think about it for a moment.

That's what they see up there where life begins but by now the yellow helmet is already subsiding below the water.

There is something ancient and persistent here, a ritual, going back to the mud to salvage the dead after they have failed to fly.

"It's funny," says Herren, after a day beneath the river. "My father was a volunteer firefighter in Prince George's County, and he was out on the river after they had that plane crash in '49. I think about that. . ."

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The author, Henry Allen, is a reporter for *The Washington Post*, where this article first appeared.

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*Undercurrent* correspondents are located in the major diving areas of the world as well as on all coasts and major inland waters of the continental United States. The editors welcome comments, suggestions and manuscripts from the readers of *Undercurrent*.

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