

## The Kona Coast, Island of Hawaii:

### *Good diving for spenders or spendthrifts*

During the last year or so I've encountered a few divers who had been to Hawaii and didn't think much of the diving. They complained about the handful of reef fish, the drab coral, 50 foot visibility and spending a round trip fortune for just plain old diving.

I'd complain too. That kind of diving exists there if you take your trips out of Honolulu or get stuck with the less adventuresome skippers. But if you make the right choices, you just might decide that Hawaii diving rates among the best anywhere.

Now, you won't find lush forests of soft coral, nor beds of antler and elkhorn coral. Nor will you find gorgonia supporting an occasional dainty and delicate flamingo tongue. Nor will you find sponges to sit in, sponges to squeeze, and sponges to provide iridescence to the coral pastels. But on the leeward side of the "Big Island" of Hawaii -- the Kona Coast -- you'll find plenty to keep you interested and busy for as long as you have the luxury to stay.

The Kona Coast begins at the top of 13,000 foot mountain peaks, slopes gently downward to the sea, ending in a jagged lava dominated shoreline undergoing constant revision at the hands of Mother Nature. Lava flows from still-active volcanoes leave mile-wide patches of rich, chocolate-colored lava rock, broken only occasionally with a lonely weed or two. Older lava beds have begun to show signs of life by sprouting a few trees or patches of grass or even an infrequent oasis. It might be cowboy country on some extraterrestrial world. And, in some areas the growth is thick and jungle like, often dotted with clusters of beautiful pink and red flowers.

Because the active volcanoes dictate the nature of the coast line, there are few sandy beaches and in most spots the water rushes up to 2-4 foot ragged ledges or to 20 foot walls. Where the lava flows are recent, the coral growths are just returning, but if the reef fish disappeared during the eruption, they must have returned as soon as the water cooled. They are indeed resplendent and abundant. Lava tubes, caves, boulders and patches of coral never touched by the flows provide the setting for surgeon fish (up to 20 inches) sporting glowing patches of yellow and orange. Everywhere yellow dominates, thanks largely to the dozen

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varieties of friendly butterfly fish which surround you on every dive. Graceful moorish idols glide about. The coral is drab pastel, but that may be the very reason that the contrasting fish appear so striking. In my opinion, Hawaiian reef fish are more colorful and more abundant than their Caribbean counterparts.

Up and down the coast the snorkeling and diving is excellent if you can find access. The shops, particularly Hawaiian Divers, will tell you where to go. Close to shore there's great scenery in 10-40 feet of water and farther out you can drop to well over 100'. On four trips to Kona I've never seen visibility under 50 feet, usually it's 80-90' or more, and it frequently exceeds 100'. There's surge close to shore but there's seldom significant current. Interesting game fish are usually spotted on most dives and once in awhile you'll see a white-tipped reef shark -- a pretty docile creature. There's not much else to scare the timid.

I took trips with three shops running out of Kailua-Kona and thanks to a letter from Undercurrent reader Harvey Mayo of Springfield, Massachusetts, discovered an excellent guide operating out of a first-rate luxury resort.

Hawaiian Divers, Box 572, Kailua-Kona, Hawaii 96740 (808/329-3407). Guide Tom Shockley has been in Hawaii three years. I found him to be a good guide then, and he's better now. He watches beginners carefully, gives good divers the freedom to do as they please once they have demonstrated their competence, helps with equipment, takes you just about wherever you wish to go once you've learned the area, and will search for the best conditions before dropping anchor. He's a personable and slightly outrageous fellow who, once he turns on his Hawaiian rock tapes as he speeds along the early morning calm waters, adds a hang-loose, relaxing element to each dive. Best of all, Tom appreciates unique fish and can find them. Although a marvelous little leaf fish he took me to a couple of years ago had moved on, this time he anchored in a patch of sand harboring a rare little green and white dragon wrasse (the only other I've ever seen Tom showed me) which dances about as if a cat on a hot tin roof. In one of my favorite spots, off the old airport, I spotted a rare, all black, long nosed butterfly accompanied by a normal, yellow, white and black mate. Here there are swarms of fish, plenty of holes to probe, and if you tire of 20-40 feet depths, you can drop over the edge beyond to 100. For photographers, a 2-3 foot approach to fish is easy.

The tariff is \$30 for a two tanks guided dive, but never on Sunday. He needs two divers for a trip and takes no more than six. Make reservations a day in advance.

Skin Diving Hawaii, Kailua, Kona 96740 (808/329-3977). This is a local hangout more suitable for beachboys than diving tourists. Guide Wick was competent enough, but his site selection did not meet the needs of two divers loaded with camera equipment. At least one spot may have been chosen for reasons other than good diving since he took a circuitous route to troll for his dinner and the dive destination may have just been the end of the line.

So far as I can tell, the only advantages of diving with Skin Diving Hawaii are that they are cheap (\$20 for two tanks) and that they dive on Sundays. On one two tank dive I had a 1900 lb. air fill. A photographer with only a weekend to spend found that one of three tanks he rented for beach diving had 1900 lbs. and another was empty! His buddy complained that air from one tank had tasted strange and Wick said, "yeah, but we changed the compressor filter so that won't be a problem anymore." Under these circumstances, I'm not sure that \$20 is a bargain.

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Fair Wind Sail and Dive, Keauhou Bay, (808/322-2778. The Fair Wind, a 52 foot trimaran, has been the subject of substantial publicity. It's undeserved. The Fair Wind is seldom under sail, said more than one crew member, because it would take too much time to get between destinations. It seems more like a barge with three hulls -- it is roomy, however -- which rides like a bucking bronco when under power. Unless you happen to be part of a charter group which has full command of the craft, you'll most likely be out numbered 2-1, or 5-1, by non-diving tourists along for a half-day cruise. Because the Fair Wind will generally seek a spot suitable for the snorkelers, you'll miss much of the good diving. Most trips are to Kealahou Bay, fine for an introductory two tank dive, but worth no more. Continental Airlines offers a 7-day package with Fair Wind claiming they provide five days of diving at different reefs. After discussion with the crew, I seriously doubt this. In fact, Continental charges \$798, for two, for luxury hotels, diving and a few frills -- a trip two divers on their own could put together for less than \$600.

### A GUIDE TO EVALUATING YOUR VACATION DESTINATION

In most *Undercurrent* travel reviews, we will compare the underwater sights to areas about which we have written previously. Before you make your travel decisions, turning back to those references should increase your information and understanding of what to expect.

Areas are difficult to compare, particularly when we recognize that preferences vary from diver to diver, that reefs change, and so do the guides' ideas of where to take you. However, a full set of *Undercurrent* back issues should provide excellent benchmarks for making the right travel decision in the future.

On page 7-8 is an order blank for back issues so that you may fill in the gaps in your library. And, don't overlook sending gift subscriptions for your friends across town or across the nation. We'll send a personal card announcing your gift.

Mike McIlvenna, Kona Village Resort, Kaupulehu-Kona 96740 (808/325-5555). Kona Village is a first class, luxurious hideaway. There are no radios, no room phones and full isolation. The beach is pleasant, and nightly mantas come in so close you can reach down and touch them. There are free sunfish sailboats, tennis courts, and fine ambiance. The lunch buffet was incredible (main course of turkey and cioppion, strawberry soup, a half dozen salads and German chocolate cake) and my one dinner even topped this. Incredible, I must say again. At a minimum of \$100/day for two (including all meals) it is not overpriced.

Mike is a skillful, sensitive and attentive guide, as capable as you'll find anywhere. I had heard that he may not always take his divers to the best available spots, but with a faster boat due to arrive shortly that problem will undoubtedly be remedied. There was nothing wrong with where he took me. My first dive was average, but he had to accommodate the two hotel guests aboard who had not been diving for several years. The second dive, 200 yards off the hotel front, was worth the trip. A flat table lies in 30 feet of water. Although somewhat barren, it's dotted with holes expanding to cave networks. Over the ledge are more caves and throughout rest a number of small whitetip reef sharks which lend themselves to face-to-face photography. Mike aids in photography by posing, by holding your strobe, and moving fish about to help with the best of shots. He's never experienced shark problems and you'll leave with some priceless photos. There are plenty of other fine sites less than a half hour boat ride away.

It's common for the Kona Coast to be overcast half the day, but there is more sun at Kona Village than at Kailua-Kona, 15 miles away. Rainy season is mid December through February, which means that there will be two or three periods of several rainy days. This year a February storm broke up coral in many areas. Mike dived during one of the worst days and reported large boulders as large as rooms being rolled about by the waves and crushing coral.

Accommodations, etc. A trip to Hawaii, even from the East Coast, may cost no more than a Caribbean venture -- there are plenty of bargain airfares which your travel agent should be able to explain. Check the OTC's. If the tariff at the Kona Village is out of your range, two can stay at the very pleasant Kona Inn for \$20-22

per day. Condominiums are available for rent; ask your travel agent or write Creative Leisure, 1280 Columbus Avenue, San Francisco for a brochure. There are parks for camping and plenty of wide open space to hide out in. The restaurants are not particularly inspiring, and none I sampled rates mention, with one exception: the inexpensive Ocean View, serving Chinese food, is a value. There are plenty of fast food places and supermarkets.

Diver's Compass: A great trip is to split a week between Kona and Maui. See Undercurrent, October 1975 for a review of the good diving out of Maui... All dive shops pick up divers at their hotels and return them afterwards at no charge... Make a reservation with Avis or Budget for a car before you arrive, but once on the Island shop for prices at the independent agencies at the airport. Prices now are as low as \$6/day and 6¢/mile for a compact... Water temperature is below 75°; wet suit tops are important... The criticism of the Fair Wind should not be extended to independent tours such as Sea and See which runs its own program; those trips are for divers only and they can find all the right reefs... the shell population is being depleted; leave the live ones for the next diver to view... there are plenty of one day film developing services... the shops can handle repairs. (C.C., 7/5)

## New Federal Effort to Regulate Diving:

### *Will sport diving survive?*

During the month of July, a tremor ran through the diving industry with enough gusto to knock an inventory of rocket fins off the backroom shelves.

On July 15, a set of Emergency Temporary Standards issued by the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, were set to go into effect to establish safety regulations for employers who hire divers. Although the regulations were aimed at the commercial diving industry and the safety of commercial divers, the regulations were also to have applied to universities who employ researchers and to dive shops who employ instructors.

The sport diving industry, through no fault of its own, did not catch wind of the proposed rules until just a few weeks before they were to go into effect. The industry feared the worst until a federal appeals judge in New Orleans granted a 30-day stay at the request of the Association of Diving Contractors and Taylor Diving and Salvage. The battle is not over, because the temporary regulations are to go into effect August 14 and permanent regulations on December 15.

PADI distributed a page of the regulations which would affect the sport diving industry. These are the more significant:

1. At the cost to the employer, each employee must be provided with an annual physical, including an X-ray series for osteonecrosis. (This would even apply to part-time instructors with other jobs.)
2. A safe practices manual has to be developed and complied with.
3. Each employee must be instructed before *each* dive of the details of the work to be performed.
4. Each employee's equipment must be inspected before *each* dive to ascertain if it is in good working

order.

5. A resuscitator and trained operator are required at each field location and worksite.
6. Two-way communication necessary to summon emergency aid must be available and accessible at the worksite.
7. Depth gauges must be regularly tested and calibrated, regulator hoses tested, and scuba cylinders stored with fitted protective caps over the valves.
8. A complete maintenance log must be kept on each piece of equipment.
9. The employer must keep a log on every employee dive.

An examination of the regulations suggests that many would contribute to increased safety but the degree of safety enhancement must be measured against cost to the industry. PADI has estimated that cost at \$18 million a year. Jim Hall, PADI Training Facilities Director, has been leading the campaign to organize dive shop opposition to the law. Hall, who is working closely with the Small Business Administration, argues that the economic impact will kill many marginal shops and cause others to drop their certification or tour guide programs altogether.

Others claim that backroom, nonprofessional training and nonguided travel and tours will lead to greater safety problems, perhaps not among instructors, but certainly among divers.

John McAniff of the Rhode Island Scuba Safety Project told *Undercurrent* that his group has no data suggesting that the safety of instructors is a serious problem in the industry. He could recall only one case during the 1970-1974 study period in which an on-duty instructor died, and she was an assistant. Since

many assistants are unpaid, it's questionable whether that instructor would have been covered under the proposed OSHA regulations.

Universities and researchers are up in arms because the increased cost to their programs might be prohibitive. For example, a graduate student of marine biology conducting research for a doctorate might be classified as an employee if on a university stipend. Should that be the case, most universities would probably prohibit such research rather than observe OSHA standards for a few students.

Why sport diving and research are included in the regulation is unclear, even though we have interviewed well over a dozen people, including OSHA officials, about the purpose and impact of the law. OSHA was created by the Occupational Standards and Health Act of 1970, an act designed in part to put much greater responsibility on employers for the safety of their workers and to put teeth into enforcement.

Since its inception it's been under heavy fire from business interests (and generally vigorously supported by labor interests) who contend that the act makes economically unreasonable demands for negligible increases in safety. Many have criticized it for harassing small businesses, while ignoring the more critical safety problems of the politically powerful giant corporations. One Department of Labor official told *Undercurrent* that "OSHA is more interested in safety regulations for streetwalkers than steel workers."

Regardless, last August the United Brotherhood of Carpenters and Joiners (AFL-CIO) filed a petition with OSHA requesting emergency standards for commercial divers. Those standards were developed and published June 15, after an extensive process involving testimony and input from a wide variety of sources—

except, however, the sport diving industry which was virtually ignored.

There are conflicting views on why the sport diving industry was not included in the discussion—the legislation required participation by affected groups—but industry people say that OSHA representatives claimed that sport diving was not the target and would not be included. Apparently other people in OSHA had different ideas and their views, along with the complexities of previous regulations that had the effect of lumping together nearly all diving-related occupations, brought sport diving under the new standards.

The industry has engaged in very heavy discussion with OSHA representatives in the last several weeks. Two recognized leaders, Ralph Shamlian, President of Tekna, and Glen Egstrom, UCLA researcher, are on their way to Washington, D.C., at the time of this writing for further negotiations. On July 20, *Undercurrent* spoke with an OSHA official who believes "that the sport diving industry's problems will be solved within a week or so." We could get no further elaboration, but there is increasing optimism that research and instruction will be at least partially excluded.

*Undercurrent*, which keeps a trained eye out for consumer interests, does not see a compelling reason to extend OSHA standards to the research or sport diving world. We have located no data that support the need for regulations, and have no knowledge of behind-the-scenes practices which create safety problems that OSHA regulations would correct.

For the present, there's little that you, the sport diver, can do to alter the course of OSHA's plans. We'll keep you abreast of the problem in forthcoming issues.

## Farallon Feud Spawns New Company:

*And it's going to be a big one*

The most observant among us may have noticed that a new company has entered the diving industry. The rest will presume that the company has been around for a while because, from a cursory inspection of their first advertisements and products, one may surely experience that strange sensation of *déjà vu*.

Sometime in August, when you walk into your local dive shop, you may spot a mask on the rack which you will presume to be a Farallon. But upon closer study, you'll note that the rim is red, not Farallon orange, and a quick perusal of the advertising copy will highlight the claim that this mask is 25 per cent lower volume. The advertising will rely on high quality photography and reproduction—and a minimum of copy—just as did Farallon. But, it's not Farallon. It's Tekna, bastard son of Farallon.

Tekna is the brainchild of Ralph Shamlian, the creator and past president of Farallon Industries. Re-

cently problems had haunted Farallon products from masks to depth gauges once they hit the market place. With the failure of the Decomputer (*Undercurrent*, February 1976), Shamlian and Farallon parted ways. Shamlian, however, did not stop long enough to pick up a check at the unemployment office. Since his departure in February, he has rounded up the capital to get started, developed products, located suppliers, hired a staff, opened an office and assembly room and developed an advertising campaign. He has already begun to ship the first wave of masks and snorkels to fill dive shop orders.

Shamlian is universally recognized as one of the top two brightest, most creative and aggressive personalities in the industry. There's no agreement about who the other is. If there is a barrier to the success of Tekna, it might very well be hidden in the strengths of Shamlian himself. Because his mind works faster than everyone

around him, once he's finished his end of the conceptualization and design of a product, he may be off on another idea, rather than attending to the engineering and production details necessary to put the perfect product in the hands of the diver. That criticism has come from many corners. If Tekna therefore shows the great temptation to rush to the marketplace prematurely, then watch out, Farallon, US Divers, et al.

Anyone who knows Shamlian knows that he did not create Tekna to manufacture snorkels. He has

begun working on a number of ideas for new products. He is reluctant to discuss them because, as he told *Undercurrent*, he indeed recognizes the problems that can stem from marketing products prior to their being fully tested for use. With his creativity, however, there's no telling what to expect from Tekna. But, should you ever come across a miniaturized regulator or a diver propulsion vehicle with two-knot speed and a mile and a half range that you can fit into a bowling ball case, just remember where you read it first.

## Why Divers Die:

### *Strict adherence to the basics may save your life*

The *Undercurrent* Reader's Survey showed a substantial interest in the cause of diving deaths. Information about fatalities is important to every diver so that he may take whatever precautions are necessary to prevent serious problems for himself. The best single source of information is the University of Rhode Island (URI) Scuba Safety Study and its report, *United States Underwater Fatality Statistics, 1974*, published in April of this year. The authors, Hilbert F. Schenck, Jr., and John M. McAniff, provide a wealth of data covering the five years of the project's history (from January of 1970 through the end of 1974) and some very useful insights. We are publishing a capsulation of that data and take responsibility for comments not directly attributed to the report or its authors.

It would seem that the greatest fault of the study is that no one has an accurate figure for the number of active divers, the number of dives made, or specific characteristics (age, certification, skills, etc.) of the diving population. Both the National Oceanic and Atmospheric Administration (NOAA) and URI estimate that there are roughly 500,000 active scuba divers, each of whom makes something more than a half dozen dives a year. Determining mortality rates for divers of different age groups or for other categories of divers remains only statistical speculation.

Perhaps the most startling conclusion about scuba fatalities is that there are *not* one or two overriding causes. Virtually every potential threat to life a diver has learned about does indeed lead to deaths. That means that a diver should never overlook even the tiniest detail while preparing for or conducting his dive. And if there is any doubt about whether he should dive, the dive should be scrubbed. Furthermore, we must emphasize that a large number of the fatalities—perhaps 80 to 90 per cent—were preventable.

Now, a look at the facts. Unless otherwise stated, the data relates only to nonprofessional or sport scuba divers for the five-year study period—1970-1974.

1. There were an average of 151 diver fatalities each year. This figure includes an average of 120 sport scuba divers and 23 free divers per year. The remainder, averaging 8 per year, were professional and semi pro-

fessional and military scuba or hard hat divers.

2. Sixty per cent of the deaths occurred in oceans or bays; 16 per cent in minor lakes, ponds or sloughs; 14 per cent in caves; and 10 per cent in rivers, quarries, pools or the Great Lakes.

3. In approximately 25 per cent of the cases, the accident occurred in less than 15 feet of water; the next 25 per cent occurred up to an average depth of 40 feet; the next 25 per cent occurred up to an average depth of 77 feet; the next 15 per cent up to an average depth of 154 feet. It should be obvious that a *sport diver must not relax his safety precautions simply because he is diving in shallow water.*

4. During the 1972-74 period, 26 per cent of the deaths took place in moderate-to-dangerous surf, current, undertow or rivers, or where there was surface ice. *Foregoing a dive in bad conditions is a measure of safety we should all recognize.* At the same time, note that 74 per cent of the deaths occurred under apparently normal diving conditions.

5. In 1973 and 1974 69 per cent of the deaths came to persons diving from the shore or the beach. Of these four per cent were using a surface float. The use of a boat, surf mat, or surface float makes a substantial contribution to diver safety.

6. Of the fatalities, three per cent were younger than 15 years old; 23 per cent were between 15 and 20; 26 per cent were between 21 and 25; 17 per cent were between 26 and 30; 14 per cent were between 31 and 40; 12 per cent were between 40 and 50; and five per cent were older than 50. We speculate that the percentages most likely reflect the ratio of divers in each age category, although there is some reason to believe that the older diver is the more cautious diver.

7. Nine per cent of the fatalities were on their first scuba dive ever; seven per cent were on their first open water dive; 23 per cent were on an early open water dive; 30 per cent had some experience; 24 per cent were rated considerably experienced and seven per cent very experienced. *Obviously, an experienced diver cannot consider himself immune to a serious accident.* In fact, some experienced divers take unnecessary risks because they believe their experience can pull them out of trouble.

8. Nine per cent of the deaths occurred in formal certification training. *Undercurrent* considers that figure excessive. Schenck and McAniff identified three basic instructional problems common to some of the 1974 accidents:

- *Dives to excessive depths.* The authors state that *early open water dives should never be in water deeper than 25 feet.*

- *Separation of buddies:* in five cases the victims became separated from the instructor or student buddy.

- *Teaching high-risk skills:* emergency ascents from 20 feet; bail-out exercises (a 15-year-old certified victim was expected to dive into 35 feet of water with his gear in his arms and put it on—he could not get the regulator to work and panicked); and buddy breathing ascents (in one case, the instructor/victim pair sank instead of ascended; the student struggled for the regulator; the instructor blacked out, then barely made it to the surface after losing the student.) The U.S. Navy has long stopped such high-risk instruction without a recompression chamber nearby.

In three of the cases, the victims had prior physical disabilities, raising a question about whether they should have been in courses at all.

9. Eleven per cent of the fatalities were diving alone; 44 per cent had a single buddy; and 40 per cent were with two or more divers. Facts of the remaining cases were unknown.

10. Sixteen per cent of the deaths occurred in multiples. In 1974, four beginners—only one was certified—died trying to penetrate a cave room 800 feet back. Although three tanks were normally required for the dive, each diver wore a single. They used kite string for a safety line and carried two diving lights and one camping light—no knives, no BC's and no depth gauges. Only one had been cave diving before.

11. Cave diving deaths seem to be increasing dramatically and appear to involve mostly untrained, ill-equipped divers. In 1972 Schenck and McAniff reported that in a survey of 62 cave diving fatalities, only four victims were adequately equipped. The greatest incidence of cave deaths was in Florida.

12. Fifty-eight per cent of the deaths were due to drowning, 23 per cent to lung overpressure, nine per cent to heart attack and 5 per cent to head injury. Only one per cent were attributable to the bends, suggesting that bends is a crippler rather than a killer.

The medical reasons for death are not necessarily the cause, McAniff told *Undercurrent*. The cause of death may be listed as drowning, but the victim could also have suffered from severe inner ear rupture which may indeed be the cause. Schenck and McAniff are working with the Undersea Medical Society to develop a more useful autopsy reporting process.

13. The authors state that *as many as 17 deaths might have been prevented in 1974 if "complete physical exams were given periodically and [if] divers with disabilities and sickness refrained from diving."*

14. Of the 14 cases in 1974 during which cardiopulmonary resuscitation was administered, nine showed

severe internal injury (such as lung puncture), apparently caused by too-enthusiastic resuscitation efforts. These injuries may have contributed to the death. In two cases, for example, the victim was alive when placed in a recompression chamber.

*Before attempting heroic efforts, the attendant must ascertain that they are merited.*

15. In roughly 50 per cent of the autopsied cases, the victim was in such a helpless condition that he was apparently unable to inflate his vest or drop his weight belt. McAniff said that in light of these statistics, training agencies might put more emphasis on survival for the diver physically unable to function. He speculated that more individuals might survive if they had not "swallowed half the sea while struggling to drop their belt."

Furthermore, training agencies should increase their emphasis on surface rescue skills and divers should continually brush up on the techniques, since in these fatal cases "well over half the scuba victims required total assistance" from another diver.

16. In 64 per cent of the 1974 cases, the victim did not attempt to inflate his vest. In one case, the oral inflator had been lost. In a second, the totally incapacitated victim was aided by his buddy, who attempted to inflate the vest orally, but the tube was blocked. The victim sank. In a third case, a novice diver, using a back-mounted BC, was unable to control her buoyancy.

17. In 22 of 600 1970-1974 cases, the vest malfunctioned during the accident.

18. Although in 1974 five incidents involved regulator problems, the authors stated that "for the fifth year in a row we have no verified case of a properly maintained regulator failing to service."

19. There was one 1974 fatality due to bad air. The air contained three per cent oxygen instead of the normal 20 per cent. The cause was most likely a heavily corroded tank, stored partially full for several months, and the corrosion contaminated the air. The diver, diving alone, expired in 12 feet of water.

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20. One death resulted from an explosion of a 150psi hookah tank while it was being filled from a high pressure unit. The attendant, the victim, became distracted and failed to stop the fill.

21. In 1974, nine cases involved entanglement in kelp, weeds or submerged trees, four in safety lines. In one case a diver became wedged between ledges in a cave. To avoid entanglement problems, *all divers should carry a sharp knife.*

22. In 1974, 22 free divers met their deaths. Two of these were caused by being struck by a boat; six seemed related to medical factors (one diver had 0.15 per cent blood alcohol level); three involved rough surf and heavy waves; one came from diving in cold water without a wet suit; two were entanglements (kelp and a spear line); and two seemed caused by shallow water blackout-anoxia. Major contributory factors for the others were uncertain, often because the deceased were diving alone.

Although the data already presented imply the cause of accidents, a more nearly complete analysis has been made of deaths reported in 1974 based on a projection of the autopsied cases. No probable cause could be determined in 32 of 141 cases. Of the remaining 109, 41 were attributed to medical conditions and injuries, including air embolism (10) and possible exhaustion embolism or panic (17). Fifty-six stemmed from environmental causes. The major causes were depletion of air in caves (23), in a wreck (2), and at a depth (11); diving in dangerous waves or surf (6); becoming tangled in kelp or brush (8); and being carried away by strong current (6).

There were 11 equipment-related cases: home-repaired regulator malfunctioned (1), old regulators leaked water (2), diver tangled in makeshift tank harness (1), diver tangled in research equipment or other gear (4), diver overweighted at a depth (2), and tank corroded and depleted oxygen (1). One diver died trying to save a buddy.

In addition, a couple of cases involving professional divers should be brought to your attention. In the first, an experienced underwater cameraman suffered a massive embolism at 170 feet. It is most likely that in the process of filming, he was concentrating on his shooting and he drifted upwards while holding his breath. It is common for photographers to hold their breath while taking movies or still photos, and it is very easy to be oblivious to the upward drift, particularly if in midwater and without stationary objects that would serve to call attention to an upward drift.

In a second case, a U.S. Navy scuba diver ran out of air at 110 feet, buddy-breathed with his partner up to 10 feet, then shot to the surface and embolized. The depth gauges of the two were eight feet apart, "thereby producing possible apprehension on the buddy's part as to when to leave the bottom to avoid decompression."

Furthermore, the victim had great difficulty clearing his ears, having to remove his mask several times and squeeze his nose while blowing, thereby consuming more air than his buddy. Both may have contributed to the diver's eventual panic and death.

As any careful reader will note, the myriad causes and circumstances of fatalities can only mean that no aspect of diving can be overlooked to ensure safe diving. If there are to be simple lessons from these statistics, here they are:

**Don't dive in heavy waves or surf. Carry a knife. Get regular physical exams. When in trouble, drop your weight belt and inflate your vest—but don't kill yourself trying. Don't dive with clogged sinuses. Maintain ALL of your equipment carefully. Don't overlook BC maintenance. Never skip breathe or hold your breath. Stay out of caves unless you have been trained. Never dive alone. Trim the excess from your equipment straps. Don't dive without a seawater gauge to monitor accurately your tank pressure. Never dive with just a j-valve. Don't dive if stoned, tired, hung over or weak-kneed. Have a dive shop with a small test chamber check your depth gauge. If you're not comfortable with the diving conditions, don't dive. Plan your dive so you return to the predetermined surface point with plenty of air left—500 lbs. Follow the plan.**

There's a fair-to-middling chance that at least one person who reads this article will end up a statistic in the next report. If you remember only one point out of the article, understand that although anything can lead to a fatal accident, **nearly every death was preventable.**

*And so is yours. Take care of yourself.*

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Correspondents located strategically 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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