

The Red Sea; Sharm-el-Shiekh: Part I

There's no need for exaggeration

With the first stream of light sneaking through my window, I rolled over to check my travel alarm clock: 5:15 a.m. I groaned. I was wide awake. I had failed to adjust to the drastic changes in time zones. I arose and peered through the window to check the water and wind conditions. They were perfect for the day's dive. And then I spied the photographic set of a lifetime. In the distance, between two hills, stood a Bedouin and a single camel, silhouetted against the magnificent sky, beams of golden light radiating from the sun rising behind. I grabbed my camera and dashed for the door, remembering as I took my first step outside that I sleep in the buff. I ducked quickly inside, donned a pair of shorts, then made tracks, as fast as my tender feet would allow, over a broken-stone road and glass-infested sand, to my great photo scoop.

I arrived out of breath, only to find I had been beaten to the shot. There stood Jack McKenney, with a couple of assistants and an interpreter. He had staged and was now directing the scene, which would soon appear in a movie to be shown at the Diving Equipment Convention, and which would grace the pages of Skin Diver. My photos, with luck, will grace the wall of my office.

More than any trip I've considered, the Red Sea has been my ultimate diving fantasy. I have heard so much about the underwater splendor that I knew someday I would have to spring for the \$2000+ required for a diving sojourn. In October my opportunity arrived. I prayed to Allah I would not be disappointed.

Allah, however, is the wrong one to consult, since the diving services are in Israel. The Red Sea is a branch of the Indian Ocean, split into two narrow gulfs--Eilat and Suez--by the Sinai Peninsula. The primary diving services are on the 100-mile-long Gulf of Eilat, at two Israeli locations--Eilat, at the very end of the Gulf, and Sharm-el-Shiekh, at the tip. It is the Sharm region, including Ras Muhamad, where one is to find the most exciting diving in the Red Sea, and perhaps in the world. As it turned out, Allah--or whoever--did not let me down.

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The weather and water conditions in the Red Sea are reported to be best from late August through October. The maximum 90° F. air temperature in the day and the 75° F. minimum night temperature keep the water temperature during this period between 76° and 80°. My buddy, who had been diving there in April, found water temperatures then between 68° and 73°, full-wet-suit water for some divers. Mild current, lack of rain (and accompanying shore sediments), and the absence of big storms (with a few winter exceptions) ensure exceptional water clarity (always 125 feet or more) and superb coral growth. Scarce rains and high rates of evaporation produce high salinity, leading to the existence of a number of endemic marine species found nowhere else. Over 1000 species of fish and thousands of invertebrates mean that there is no other place on this planet where such a small area of sea supports such a rich profusion of marine life.

The diving was, without the slightest exaggeration, fantastic! The renowned dive sites live up to their reputations: Ras Muhammed, Shark Point, Ras Um Sid, the Temple, the Tower, the Garden, the Mercury Wreck, Marsa Bureka, the Straits of Tiran ... The fish life is incredible. Many species I had never seen before in my 18 years of diving around the world. Some, such as the angel fish and butterfly fish, resemble in shape their Western cousins, but their markings and colors vastly differ. Small rainbow wrasses were vivid surprises; they look like multi-colored lime, turquoise, yellow, white, and magenta Disney creations. The chartreuse box fish, spotted with brilliant blue and gold, and the Picasso fish are indeed surrealistic. The Napolean wrasse--weighing up to 100 pounds--is plentiful, and occasionally quite friendly, especially at the Gardens. And I saw parrot fish, needle fish, trumpet fish, pipe fish, surgeon fish, trigger fish, puffer fish, barracuda (solo and in squadrons), tunas, jacks, groupers, blue-spotted and eagle rays, dolphins, unicorn fish, turtles, sharks, enormous morays, giant tridachna clams, anemones (with their resident clown fish), crabs, crowns of thorn, red and pink starfish, goat fish, bird fish, lizard fish, crocodile fish, sea horses, file fish, bat fish, box fish and so many other kinds of fish that I could not learn their names.

The night diving contains surprises I never had experienced. As soon as the bubbles disappear, one is greeted by hundreds of phantom lights moving in all directions. These are the "flashlight fish" photographed and written about by Dr. Eugenie Clark in the November, 1978 issue of National Geographic. The reefs are covered with basket stars, brittle stars, and feather stars. Lion fish are everywhere. Sea urchins the size of basketballs can be observed crawling the reef walls, while an occasional crown of thorns can be found attacking the reef. And new critters, not seen during the day, come out to visit divers. The range of species is phenomenal, the overall experience thrilling.

Hard corals encrust the reef like gems, but it is the soft corals which are most impressive to American divers, who see so few of these graceful colonies in the Caribbean. They cover the drop-off in great bouquets of amber, red, green, gold, mauve, and pink. Their plump stems and delicate tentacles sway with each surge, an illusion reserved usually for the psychedelic. The breath-taking walls, with their sheer drops, the many caves, the canyons, and the huge coral heads are covered with live, feeding corals. And because of the clarity of water and the bright sun, the colors are more vivid than I'd ever observed before.

We dived to all depths, but I found that the best scenery was in 60 feet of

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water or less. On many dives I never ventured below 40 feet and stayed down as long as an hour and 40 minutes. I could often get more than three hours underwater with only two tanks a day. Most of the dive sites are no more than 50 to 100 feet from land (except for the Straits of Tiran, which are in the middle of the entrance to the Gulf of Eilat). Rides by jeep to the shore-entry sites can be rough enough to displace vital organs. And the water is often too shallow to snorkel the short distance to the dive site. Walking across the reef table with a tank is tricky. So the package trips employ boats for divers. It's easier and more comfortable for us middle-aged tourists. But, for the adventurous, budget beach diving is indeed a reality.

A discussion of the boats, the guides, and the tour components is too lengthy for this issue. I shall reserve it for next month. Suffice it to say that my tour group was Sea Life Discovery, a small California enterprise (19915 Oakmont Drive, Los Gatos, CA 95030, (408) 353-1766) directed by Kent Schellenger, the former Chairman of the Sierra Club Underwater Exploration Section. As you might imagine, the Sierra Club philosophy of conservation has carried over and Schellenger and his tour leaders are dedicated to "observation, photography and informal study of marine life," while respecting the obligation to leave the sea as they found it. At our destination our diving was done with the Red Sea Divers, an operation used by many tour groups. I will review their services in the next issue.



SCENES LIKE THIS AWAIT TRAVELING DIVERS AT SHARM-EL-SHIEKH

We lodged at the Marina Hotel in Sharm-el-Shiekh, commonly selected by dive tours because it is located on the beach, 75 yards from the Red Sea Dive Center. The hotel--four stories, 78 rooms and 38 bungalows--is clean, comfortable, and air-conditioned. The electrical power is 220 volts, 50 cycle, so a converter and adapter are required to recharge strobes or run American appliances. The hotel staff (most of whom speak English) is efficient and knowledgeable, but not particularly polite, and in fact, by Western standards, sometimes rude. Adjacent to the hotel is an Israeli army tent with a machine-gun emplacement. Roving jeep and foot patrols are constantly in view in the streets.

Kosher hotel meals were satisfactory. Breakfasts, for those willing to venture beyond eggs and toast, were rewarding: smoked marinated fish, sliced tomatoes, cheeses, hard-boiled eggs, yogurt, olives, rolls, cottage cheese, cucumbers--just like my favorite New York deli. Lunches were served on the dive boat. Dinners were bland. Tantalized with good appetizers and soups, I was disappointed with overcooked chicken, turkey, and occasionally beef or fish. A bottle of decent Israeli wine at \$4.40 did wonders to redeem the chef. I would recommend straying occasionally from the package plan to eat at one of the two nearby beach restaurants, both of which have excellent fish selections. I particularly enjoyed the Last Refuge, a name appropriate to its appearance. For dinner anywhere, T-shirts and shorts are normal attire; sandals are essential to cross the broken glass in the sand between the dive shop, the restaurant and the hotel.

Snorkeling in front of the hotel is an enjoyable way to beat the late afternoon heat. Well-populated coral heads are just a short swim. The beach in front of the hotel is relatively clean, although prone to being littered by vacationing locals. The entire area is home to biting flies, which seem to work their way past Cutter's spray, at least for me.

Although a map may show the town of Phira to be a few minutes from Sharm, Phira consists of only a few stores for the local residents. Aside from inexpensive sou-

venirs and liquor, there is nothing else to attract your dollars. And be sure to use dollars when paying the hotel bill. Bills paid in currency not Israeli have only a 15% service charge added. If your bill is paid with Israeli currency, an additional 28% will be added for a social welfare tax, a valued added tax, and an indirect tax.

(S.C., 11/78)

Next Issue: Guides, tours, and diving surprises.

The Novice Diver

Research shows mistakes are predictable

Each year between 150,000 and 200,000 people are certified as qualified scuba divers. These divers have listened to lectures on diving theory, been trained to perform certain skills in the pool, and, hopefully, had several open-water dives. After passing exams, the student is certified and allowed to venture on his own into the diving world. He is a novice diver.

A newly certified diver is not necessarily a safe diver. For example, the University of Rhode Island survey of U.S. diving deaths during the period from 1970-1974 found that, of the fatalities during that period, 9% were on their first dives ever, 7% were on their first open-water dives, and 23% were on early open-water dives. Lloyd Austin and Albert Behnke, writing in the *Journal of Sports Medicine*, conclude that "diving mishaps are caused by inexperience and inadequate training, particularly in the period of transition from swimming pool to open water."

The traits of a novice underwater explain why his inexperience causes him problems. For example, in an experiment undertaken by Weltman Christianson and Egstrom (published in *Human Factors*) involving both experienced and inexperienced divers, the researchers found that a novice's response pattern changed "radically" in the ocean. Heart rate and respiration increased in no apparent relation to task difficulty. The mean rate of respiration was 55% greater for the novice in ocean diving than in pool diving.

The researchers believe that the most likely explanation is that "the observed heart-rate increase and over-breathing were the result of heightened anxiety and/or arousal in the ocean, that the psychological factor affected the novices more than the experienced diver, and that the greatest effect on the novices occurred as they entered the water." The researchers conclude that for novices "psychological stress was a significant factor even at shallow ocean depths."

In another study undertaken by Adolf Deppe (appearing in *Perceptual and Motor Skills*), novice divers were found to demonstrate significant varia-

tions in ability to estimate time underwater. In all instances novices misjudged one minute intervals, with an average error of 37%.

Helen Ross, D.J. Dickenson, and B.P. Rupp (in a study published in *Human Factors*) reported on experiments with subjects, of varying degrees of experience, who were required to swim the sides of an imaginary triangle underwater. In most cases, whether blindfolded or not, the divers swam too far and veered erratically to the right. In another experiment the divers were asked to swim specific distances along a rope and mark them off. "The novices swam too far, whereas the experienced divers swam almost the correct distances."

"The main conclusion to be drawn from these results," say the researchers, "is that distance estimates are much more variable underwater...particularly for novices. Inexperienced divers tend to swim too far... Diver experience is an important variable in underwater perception; novices generally show higher variable and constant error than experienced divers." The authors suggest that a combination of physiological, psychological, and environmental factors (e.g., fear, narcosis, cold water, anxiety, low visibility) lead to a greater tendency for novices (as contrasted to experienced divers) to fail to follow instruction.

These studies, then, suggest a number of generalizations:

- ★ Novices have a significantly higher rate of heart beat and respiration than experienced divers. The novice can be assumed to be under greater stress.

- ★ Novices tend to underestimate the time period during which they are submerged. If their air holds out, they may stay underwater longer than they have planned.

- ★ Novices tend to underestimate the distance they swim and therefore may swim farther underwater than they planned.

- ★ Novices, in the absence of any visual landmarks, may not swim in a straight line.

- ★ Novices may fail to follow a prearranged dive plan.

By viewing these factors in combination, one can see serious potential problems confronting a novice. While under the normal stress accompanying inexperience, a novice may stay down too long, may swim too far (and not in a straight line), and when stress increases he may deviate from his dive plan.

The best way to avoid these problems, of course, is to continue with instruction until one is fully competent, but few novices will heed such advice. Instructors, however, can be alert for students who demonstrate these deficiencies and alert them to the potential problems. Regardless, the ultimate responsibility will fall on the novice. Steps short of going back for further instruction can be taken to make diving safer:

★ A novice should dive only in water and under conditions in which he feels comfortable.

★ A novice should be accompanied by an experienced diver. One novice diver may not be able to recognize or handle the trouble signs in another novice.

★ A dive plan should require a novice to begin to return to his point of departure when he has used up a specific amount of air (e.g., when 1000 psi is left in his tank) rather than after he has swum a certain distance, since he may underestimate the distance he has covered. A submersible pressure gauge (rather than only a j-valve) is essential.

★ A novice, because of his tendency to underestimate the amount of time that passes, must dive with a watch or Bottom Timer so he can ac-

curately monitor his dive profile against the no-decompression limits.

★ Where there is any possibility of becoming disoriented (in kelp beds, in low visibility, in deep water) a novice should use a compass to insure that he is swimming in the direction he intends.

Of course there are a number of other "musts" and "shoulds" for novices and experienced divers, but those we have noted relate directly to the research reported here. A novice who understands the ramifications of his inexperience can prepare himself for safe diving. But a novice who assumes he can rely on his brains or his buddy to overcome his own inexperience is looking for trouble. Getting certified is only earning a license to begin diving. Becoming a safe diver requires plenty of practice and experience in open water.

Obviously a person who is under stress and who cannot judge distance or time or swim in a straight line cannot be a safe diver.

★ ★ ★ ★

Ronald J. Krul, an active PADI instructor and a diver for ten years, is the author of this article. Krul presently is the Director of Red Cross Safety Services and Volunteer Training in Niagara Falls, New York. This is a revised version of an article which originally appeared in the PADI *Undersea Journal*. *Undercurrent* takes all responsibility for editorial changes.

The Seaquest Delta BC

An executive in a major dive company was recently overheard saying, "We've done everything we possibly can to come up with a new design for a flotation device, but everytime we get something that works we're duplicating Scubapro's Stabilizing Jacket and infringing on their patent. I guess the only thing left is to cut a deal with them to sell a variation of their design under our name and pay them a fee for the privilege."

The Scubapro, which looks just like a man's vest, is the hottest piece of equipment on the market. Although Scubapro will not release sales figures on the vest, sales manager Mike Brock told *Undercurrent* that "the Stabilizing Jacket is making as much of an impression on Scubapro's business as did the introduction of jet fins."

The stabilizing vest is the third improvement in flotation design in this decade. Anyone trying to keep up with the design changes would barely have wear-and-tear on one model before having to move on to the next. For the manufacturers, what could be more

—Looks are deceiving

profitable?

Each design, however, has been a considerable improvement over the previous. The horsecollar provided greater lift and easier buoyancy control than the snorkeling vest (or the Mae West). Back-mounted flotation permitted easier resting and long-distance surface swimming, fewer straps, and less apparent drag. Because it's attached to the backpack, the bag, pack, and tank can be tossed overboard to be donned in the water.

The primary liability of the back flotation device is that if a diver loses consciousness it will float him on the surface with his face *in* the water. For this reason alone, many instructors won't train their students with back flotation devices. But the next generation of flotation devices, led by Scubapro's Stabilizing Jacket (with variations by U.S. Divers and Seatec), overcomes this liability and makes additional inroads. Both the Scubapro and the Seatec require only one strap and buckle for the tank and the vest, eliminating that old nemesis: excessive straps. At

half-again the price of the Seatec Bluefin, the Stabilizing Jacket is selling like crazy and now appears as standard training gear in many dive shops and standard rental gear on many dive charters. The wise shop owner knows that sales spring from rentals and training equipment, so why sell an \$80 horsecollar if you can gently persuade a customer to spring for the \$260 Stabilizing Jacket?

With that kind of price tag, no wonder manufacturers are struggling for new marketable designs for flotation devices. And no wonder Sequest has attempted to enter the market with its new design, the Delta.

The Delta looks a bit like a miniature armchair, sans seat. (See accompanying photograph.) Its primary departure from the standard back flotation design is that arms wrap around the diver's side. In this respect it looks a bit like a bastard son of the Scubapro, rather than just a bastard clone of a back-mounted bag. But once in the pool, we quickly assessed its identity. 'Tis a bastard clone, this Delta, and not one to improve on its predecessor but rather to mock it.



Two *Undercurrent* testers put the Delta through a variety of tests, while two other divers and instructors took it through private workouts. Everyone's results were the same. In most situations it performs as a back flotation device would perform, but with one significant disadvantage.

The wraparound arms tend to trap air. When the device rolls over in the water the trapped air does not shift smoothly and therefore the divers met resistance to turns. In some cases they had to struggle to complete their turns. The arms, in our estimation, provided no advantage. We had hoped that they might float us face up in the pool, but we found—as the instructions admit—that an unconscious diver would float with his face in the water, just as with a standard back-mounted device.

There are some plusses to the Delta, however, that a diver who doesn't mind the resistance may wish to consider. On the wraparound arms are pockets, a feature not offered on back flotation devices; a crotch-strap has been added to keep the flotation from riding up; and there is an optional CO₂ attachment.

With a power inflator the Delta lists for \$168, \$30-\$50 more than many acceptable back-mounted flotation devices. It can be added to any backpack, advises the instructions, but we recommend fitting it to yours before purchase.

We found no significant advantage to the Delta over conventional back-mounted flotation devices and, in fact, some disadvantages. We wonder whether the Delta is the precursor of other models from other manufacturers designed to capitalize on the Scubapro breakthrough. We hope not. If the manufacturers can't do better than this, then they might as well pay Scubapro their royalties and stop wasting money on design. Both consumers and the companies will be dollars ahead.

Owning a Dive Retreat

How to create a partnership of buddies

Less than a year ago, the management of Spanish Bay Reef, that excellent diving resort on Grand Cayman Island (see our review in the February, 1978 issue of *Undercurrent*), offered their diving customers the opportunity to buy one of 12 condominiums they proposed to build adjacent to their existing units and just a few short steps from the dive shop and boat. The asking price was \$32,000, with \$10,000 required as a down payment. The projected vacancy rate for hotel use was so low that Spanish Bay management believed that the rentals would cover the mortgage and other out-of-pocket expenses

for the owner, leaving him with several free weeks of lodging each year. Within 60 days the condos were sold to Spanish Bay's diving clientele.

Traveling divers also recognize San Salvador Island, in the Bahamas, as a desirable dive destination, and there a land company, Columbus Landings, offers homesites for those looking for a vacation home. And in Hawaii, the home of good diving, new condos are constructed daily; in the last few years prices have doubled and tripled — and the ceiling has not yet been reached.

There's hardly a diver alive who hasn't fantasized
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about owning his own little retreat on the edge of abundant blue waters, but the price of single-family units has risen beyond the means of most of us, and now condominiums too have priced themselves out of reach.

Yet there still is a solution for middle-income people, which some wise divers have already discovered. By forming a partnership with any suitable number of people, a group of divers can own a condominium at a preferred diving site and eventually experience a handsome return on their investment. Here's how it works:

Suppose six members of a dive club (or a dive-shop owner and five customers, or even a single diver and five non-diving friends) decide to organize a partnership to own a condominium. Normally, each puts up an equal sum for the down payment and each has an equal responsibility for the expenses and shares equally in the income. Each diver has the use of the unit for, say, two weeks each year, leaving 40 weeks for the unit to be rented. Equal shares are no hard and fast rule; partnerships can be formed with different amounts from each individual and varying use privileges.

Analyzing The Figures

What do the figures look like? Let's assume you find the perfect condo for \$75,000, requiring $\frac{1}{3}$ (\$25,000) down. If closing costs total \$1,500, then the cash requirement is \$26,000, or \$4,417/person. The monthly expenses (assuming a \$50,000, 30-year mortgage at 10½ percent) would be approximately:

| | |
|------------------------------|-------|
| mortgage..... | \$457 |
| taxes | 100 |
| maintenance/management | 150 |
| insurance | 40 |
| utilities | 50 |
| miscellaneous | 50 |
| | <hr/> |
| | \$847 |

The annual cost of the property, then, is \$10,164. Assume that, of the forty rental weeks available, rentals will be found for only thirty weeks. And say that the rental rate is \$250/week. The income then would be \$7,500, and, to meet expenses, the partners would have to contribute annually an additional \$2,664, \$444/person.

The upshot of this is that each partner is $\frac{1}{6}$ owner of a condominium for an initial investment of \$4,417 plus \$444/year. His investment will grow in value while he is enjoying his own diving retreat.

How much will it appreciate? No one can predict future values, but if one just assumes that inflation drives values up by 10 percent a year, then in five years this condominium will be worth \$109,800, or \$33,300 more than the purchase price plus closing costs.

Because, however, the income would not cover the expenses and the six partners would be required to

contribute an additional \$13,320 to cover the expenses, the actual value of the total investment would have increased by \$19,980 or \$3,330/partner. (The sophisticated investor will recognize some missing variables: part of the payments include principal; both rental income and expenses would probably increase over five years; if the property were sold commission would substantially reduce the profit. Since these factors may very likely cancel each other, we have eliminated them for simplicity.)

Nevertheless, had the diving investor's venture paralleled this example, after five years he would be able to describe his financial position in one of two ways.

"I invested \$7,081 in a condominium, saw my investment appreciate by 47 percent, and had free lodging two weeks a year at a good dive spot."

Or: "I invested \$4,417 in a condominium, saw my investment appreciate 75 percent, and paid \$444 each year to rent a condominium at a good dive spot."

And there are a few tax benefits, although they are minimal compared to investments in nonvacation property. Under our example, one would not be able to show either a loss or a gain. However there would be some depreciation to be written off and the individual partners would each be able to write off a share of the taxes. Of course, if the property were sold at the end of five years, the capital gain would be taxed at only 40 percent under the law recently signed by President Carter. Before investing in any vacation property, one ought to consult with an accountant.

The Pitfalls

In any real estate investment there are potential hazards. First, recognize that this is only an example. In the area you prefer you may be unable to find a condo you like for \$75,000 which can rent for \$250. And there are other hazards. An oil embargo would mean no one would be flying to your island to rent your condo, but you would still have to make payments.

The economy can change. Too many rental units on the market would mean you might have vacancies for more weeks than you can afford. Bad management might mean fewer tenants and increased costs. In a foreign country an unstable government can have severe implications.

On the other hand, if you select wisely after a careful study of the market, then you can make a wise purchase. To ensure good management, one partner should be in charge of partnership management. Compensate him by giving him an extra week or two at the resort free. He pays the bills, handles taxes, and especially rides herd on rentals, to ensure that the management company is doing its job. He supplements the efforts of the management company at home with ads in dive shops, newspapers, and magazines.

Getting Out

If you stop diving or want to leave the partnership for other reasons, the process will generally be spelled out in the partnership agreement. (Most lawyers can provide a standard partnership agreement which can then be modified to meet your special needs.) Typically in a partnership the departing person must first offer his share to the existing partners, and if none wants to buy it he then offers the share to outsiders. If your investment is now worth \$7,741, as it is in our example, you might be able to sell it for full value, but often a reduction of 10 percent or so is common for a faster sale. That would reduce your profit; however, your return would still be decent.

Locating The Property

Some of the large real estate firms in major cities have information on condominiums outside of the continental U.S. The tourism department of the country or state in which you are interested can also provide you with information by mail, your travel agent can get the addresses for you. You'll probably need to make two or three trips to a place before the purchase, so leave yourself plenty of time on each

trip to visit the available units and understand the potential advantages and disadvantages of your investment.

Putting together the partnership will take time and, of course, money. But when you think about how much you spend on foreign dive travel, about how much you lost in last year's stock market, and about how rapid the appreciation has been in prime vacation property, you'll see that organizing your own partnership may be quite an investment — not to speak of all that good diving at *your own doorstep*.

NOTE: The example we used only illustrates the means to analyze a condominium purchase and does not represent any existing condominium deal we have discovered. In some vacation developments the annual expenses would be far greater for such an investment, but in others the figures might be close to what we have presented. Furthermore, there are a variety of plans for purchasing condominiums and some developments have such a structure established that this kind of return would be impossible — the builders and managers take a much larger share. We have made no effort to discuss other plans and will leave the analysis up to you and your accountant. We'll only tell you about the diving.

Frozen Regulators, Hypothermia and Diving Reflex

Ideas for cold-water safety

Cold water and freezing air can cause a regulator to freeze. Divers who undertake trips to the deep in these adverse conditions need a special understanding of the limits of regulators. We would first like to share some comments, edited, that recently were directed to Navy divers in their periodical, *Faceplate*. The author is "The Old Master Diver," who writes a regular column.

The Old Master Diver: "For cold-water diving, the choice between single-hose or double-hose regulator is difficult. The single-hose has superior breathing characteristics. It is easier for buddy breathing and is less bulky. However, the single-hose regulator has a greater tendency to malfunction from freezing than the double-hose regulator.

"The first stage of a single-hose regulator can freeze from the expansion of air under pressure and from breathing wet air. As this occurs, ice will start forming around the first-stage housing. Next, the water around the pressure-reducing spring will freeze. As ice forms around the spring, friction and jamming of the spring may occur. This may jam open the valve, resulting in increased air pressure, which may then cause the second-stage valve pin to lift off its seat. Freeflow may result.

"Freeze-up of water around the first-stage can be eliminated by covering the chamber surrounding the spring with a flexible rubber cap filled with glycol or 100-proof alcohol.

"Even with this modification, however, if the second-stage is purged or allowed to freeflow, the demand mechanism may freeze. Extra precautions must be taken to ensure that moisture does not get into the second-stage of the single-hose regulator.

"Double-hose regulators can also freeze. Moisture from a diver's breath can freeze on the regulator housing and, if it becomes thick enough, it can prevent the diaphragm from operating properly. A loose retainer nut on the regulator will allow moisture inside the housing, where it can freeze and cut off the air completely.

"For either regulator design, be sure that all moisture is removed from the inner working parts and be certain that the air supply is clean and dry."

And, some random thoughts: In cold weather a regulator should not be purged or tested until actually in the water. Simple testing outside of the water can cause the second-stage to freeze.

Any moisture in the compressed air can freeze and lead to regulator malfunction. Dive shops that

specialize in cold-water diving take special precautions to ensure that their air is dry. We spoke with one shop which uses two additional filters to reduce moisture in the air coming from the compressor.

As to any diving, a well-maintained regulator is essential to cold-water diving. Using a poorly maintained regulator in freezing conditions increases the possibility of malfunction.

And to demonstrate the risk of scuba diving in cold water and cold weather, we should note that the Naval Experimental Dive Unit does not sanction scuba diving under these conditions. They use other systems.

And, from the Old Master Diver, a tip on hypothermia: "A diver who has lost substantial body heat (hypothermia) loses muscle strength and the ability to concentrate. Severe hypothermia can result in collapse or unconsciousness. The treatment of hypothermia, of course, is to rewarm the diver. How do you know when he is sufficiently warm? Don't ask the diver, because studies have shown that a diver will claim he is warm even though he has regained less than half of his body heat.

"A good indication that the diver has in fact been adequately rewarmed is when he begins to sweat—only at that point is he ready to undertake a repeat dive."

Near-drowning and diver's response: Cold water, of course, plays a major role in diving accidents, but it may also save lives. Dr. Martin Nemiroff, of the University of Michigan Medical School, reports that the U.S. Navy's *Fathom* magazine has discovered that a substantial percentage of presumed dead "drowning victims" are still quite alive. In fact, Dr. Nemiroff has successfully revived, with no permanent after-effects—and no brain damage—a man trapped underwater and ice for 38 minutes. Furthermore, Dr. Nemiroff has revived another 33 persons, again with no permanent after-effects, who had been submerged an average of

ten minutes.

Survival in these cases, in which the body tissues and especially the brain are cooled and require less oxygen, is apparently aided by an involuntary reflex called "diving response." Nemiroff told *Undercurrent* that "the response is triggered by a combination of water, cold, and pressure operating in the area above the nose." As to what is "cold water," experts seem uncertain, but it appears to be somewhere around 70° F.

In diving response, a small yet sufficient oxygen supply is very slowly and imperceptibly circulated among the lungs, heart, and brain, but not to the extremities of the skin. Persons who have been underwater for several minutes may appear dead—their skin and lips can be blue, they have no observable pulse or detectable breathing, the pupils of their eyes may be fixed—but they may still be alive.

This diving response has been observed in air-breathing aquatic mammals such as whales, porpoises, and seals. When threatened, these animals have the ability to remain submerged for several minutes; some species may remain submerged for up to a half-hour. Man has the same capacity, although as a human being grows older the capacity is severely diminished.

In all presumed drowning cases, Dr. Nemiroff recommends aggressive, sustained resuscitation, initially using rescue breathing and cardiopulmonary resuscitation (CPR). He further recommends that, even if the victim shows no apparent vital signs, he should be taken immediately to an adequate medical facility. Until a medical staff warms a presumed victim to normal body temperature, which may take up to three hours, no one can be certain whether he is dead or alive. Furthermore, many revived near-drowning victims die within 24 hours of the accident because some water remains in their lungs. Therefore, all drowning or near-drowning victims should be taken to a hospital immediately.

Finding \$100,000,000 in 50 Feet of Water

The secret was in library research

In the September issue of Undercurrent we reported on a treasure expedition, led by Dennis Standefer, to locate the *Nuestra Senora de Concepcion*, a Spanish galleon which sank in a storm in 1841, 80 miles off the coast of the Dominican Republic. The ship, with 520 people aboard, carried treasures which researchers estimate are worth between \$40,000,000 and \$100,000,000 today.

The *Concepcion*, as the media has blared, has been recovered, but not by Standefer. Instead, an expedition led by treasure hunters Burt Webber and Jack Haskins located the remains of the galleon and,

on November 30, discovered mounds of ballast in 50 feet of water. Soon thereafter they uncovered their first piece of eight.

The existence of the wreck of the *Concepcion* has been no secret to other treasure hunters, but all, including Jacques Cousteau and Mel Fisher, have searched the area now called "The Silver Bank" and failed to pinpoint the precise location. To aid their search, modern treasure hunters have used bits and pieces of the log of a ship called, "The Henry." Forty-six years after the *Concepcion* sank, William Phips, captaining The Henry, spied the remains of

the ship through the clear Caribbean water. He was able to salvage 32 tons of silver, but the rest remained beyond his salvage capacity. In 1977, Haskins and Webber also searched the Silver Bank, but their \$250,000 expedition returned empty-handed.

However, a letter from an English friend of Haskins' raised their hopes. The writer casually mentioned that of course Haskins must have a full copy of The Henry's log, which was on file in a small library in England. Believing that no treasure hunter had ever located a copy of that complete log, both Webber and Haskins jumped planes for London to see for themselves. Indeed, it was a full log and in it were the missing pieces of the puzzle.

Since they had previously spent \$15,000 for an aerial survey of the Silver Bank, their success was a matter of matching the log with their photo maps. Obviously a great deal more was involved—including Webber's development of a crucial piece of equipment to register anomalies in the earth's magnetic field caused by buried iron—but, as Haskins says, "the treasure was actually found that day in that English library."

On January 7, 1979, they were to set sail again to recover the major share of the booty. They refuse to disclose the value of the treasure so far raised, but it includes single silver coins worth at least \$1000 each, silver plates, forks, and candle holders, Chinese porcelains, and a variety of artifacts lost in transit between Spain and the New World nearly 340 years ago.

What sum these treasure seekers will net is uncertain. There are bills to be paid—this year's venture costs more than a quarter-million—and there's a crew to consider. Of course investors who backed the venture will also claim a healthy chunk. And the big-

gest winner of all will be the government of the Dominican Republic, which will get half the loot. According to Haskins, they negotiated a contract with the Dominican Republic because "their navy protects these waters and we wanted to avoid political problems if we located the treasure." While the expedition members were away for the Christmas holidays, a Dominican gunboat stood guard over the treasure site.

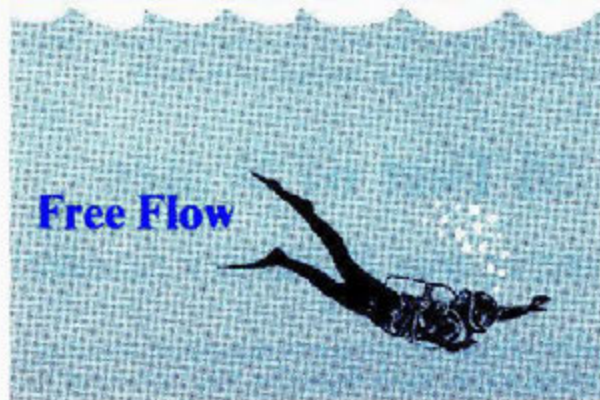
With all these hands in the treasure chest, one still need not be concerned about the bank accounts of Webber and Haskins. One hundred million dollars—or even forty million, for that matter—can stretch pretty far, even in 1979.

Is there really \$100,000,000?

The following quote came from Robert F. Marx's *Shipwrecks of the Western Hemisphere*, published in 1971.

"The story of Sir William Phips's recovery of the treasure from the *Concepcion* in 1687 is well known, but for some unknown reason a myth has persisted stating that he did not recover all of the treasure from this wreck. The fact is that he recovered almost twice the amount that the ship's register stated she carried, and other salvors worked on the wreck both before and after Phips arrived on the scene, so there is little likelihood that there is much more left. Still, almost every year during the past two decades there have been major expeditions after this wreck. . . ."

Could it be that this is why the treasure hunters have so far refused to disclose what they've recovered?



In tests last year the U.S. Navy discovered that the charcoal filter on the Stewart Warner 4 SCFM 3000 psi compressor had the potential to contaminate the air it pumped when the carbon granules broke down. The Navy also found, however, that the charcoal filter made *no* measurable improvement in air quality. The Navy ordered the filter removed from the models on hand and the filter is no longer included on new models from Stewart Warner.

Last July we reported that the NASDS regulator plug is a useful device for octopus regulators. Lewis Kauffman, a YMCA SCUBA field representative, wrote that the plug fits his U.S. Divers regulator mouthpiece so well that it creates an air pocket in the second stage which in turn creates a low-pressure area that causes the regulator to freeflow. He solved the problem by cutting small notches in the side of the regulator, permitting small water to enter the second stage and preventing freeflow.

A student diver died last month at Monastery Beach, near Carmel, California. A wave hit her while she was entering through the surf and sucked her beneath the surface, apparently without her regulator in her mouth. It was her first ocean dive. The surf at Monastery is tough for many experienced divers, but instructors persist in bringing their beginning students to the picturesque site. Of course one might immediately move to castigate the instructor who brought her to this beach, but he's paid penalty enough. The victim was his sister.