undercurrent®

THE PRIVATE, EXCLUSIVE GUIDE FOR SERIOUS DIVERS

October, 1977
P.O. Box 1658, Sausalito, CA 94965
Cable Address: Gooddiving

St. Lucia, West Indies:

A story that shouldn't be written.

This is a review I'd prefer not to write. My reluctance is not based upon writer's block. Nor do I hesitate because I'm worried that readers will balk at my story. My recalcitrance is not caused by lack of interest.

I don't want to write this review because words will probably bring death to virgin reef. I don't want to write this because 10,000 divers, no matter what their intentions, no matter how hard they try to conserve underwater life and splendor, cannot swim a reef without irreversibly harming it.

My foremost concern is not with the new diver who just has to bring home souvenirs from the deep to prove his underwater skills to the neighborhood. He rips off a branch of black coral. He picks up a live Triton's Trumpet, and hangs the animal, shell and all, on a clothesline to let the weight of the shell break the animal's grip on its home. The animal, out of the life giving ocean, dies a long slow death. The diver yanks off a tube sponge and stuffs it under his BC for the trip to the surface. He grabs a handful of what he calls "dead shells," ignoring the live hermit crabs that crawl out on his veranda and roast in the hot sun, a few yards from the ocean. He breaks off a hunk of finger coral, relegating it to a 10% clorox solution to bleach it white for the coffee table. He only takes enough to show the folks back home that he's a scuba diver, just as the other 200,000 newly certified American divers take "just enough."

Still, the neophyte souvenir hunter is not my primary nemises. We'll never stop the wide-eyed from a few pickings, but perhaps someday, all but the idiots will stop taking live specimens from the reef.

My great concern is with the average diver--you and me. We're real conservationists. We dive the waters of the world with deep respect for its life but in our wake we leave a nearly invisible trail of death and destruction. There is no use avoiding the damage we do as we explore the reef, inside and out, while never taking a living thing.

A virgin reef I saw in St. Lucia thrilled me, but its fragility brought waves of sadness. My excitement was shared by other touring divers who could only shake their heads in wonderment and say to the guide, "Are you aware of

INSIDE UNDERCURRENT

what you have here!" They shared my excitement. I hope they understood my sadness.

The reef I speak of begins 25 minutes by boat southward from Castries, the capital, and extends for a mile or more to the southern tip of St. Lucia. If traveling by car, it's close to an hour and a half along a road which required 67 honks from our cab driver to warn natives on the other side of the tight turns of our approach. The drive is beautiful.

Our guide, the only one in Castries, Junior Alcee, boated us down the coast, explaining that dives along the way didn't amount to much. We were to take our dive from the beach of a small hotel, the Anse Chastenet. We began from the hotel beach. A few fish skittered about the sandy bottom and the visibility ran about 50 feet (others who have been to St. Lucia say 100 feet is common). Ahead in the mist, at 30 feet, lay the reef. I first noticed a sizeable fish population frittering away the day, but became distracted by thousands of bait fish moving with the instant precision of a drill team. A trio of mackerel stormed through the ranks in search of supper, but those ranks opened and closed with such exactitude that I doubt the success of the mackerels. Among the stationary growth of the reef swam larger fish, notably snappers up to five pounds. They were easier to approach than fish on other reefs, perhaps because few divers visited here.

Fish life was varied and prolific. Not only were the ordinary present--grunts, damsels, bluehead and parrots--but the not-so-ordinary--fairy basslets, hamlets, brilliant tangs, blue chromis, clown wrasses and grey angels. I saw several dainty juvenile drums in the holes of the reef, and a gathering of snapper shrimp, red-banded coral shrimp (there were several varieties) and purple pincher crabs like I'd never seen. Back in the holes were plenty of small lobster and, of course, the usual roundeyed red residents waiting for nightfall. What a resplendant array!

Just as fascinating was the reef itself. Sheet coral cascaded down the slope, covered with full-pile plush carpets of colony sponge, soft and sensuous to the touch. Soft coral, fire coral and sea fans were limited, but at 60 feet the black coral began, and there grew massive deep-water gorgonia, often with colorful crinoids at their base.

That's why I don't want to write this article. If I return in ten years, I suspect that the reef I have known for but a day will be unrecognizable. Even the most cautious diver will have damaged the reef, unintentionally to be sure, but who cares why. I,

Statement of Ownership, Management and Circulation

(Required by 39 U.S.C. 3685)

1. **Title of publication:** UNDERCURRENT
2. **Date of Filing:** 10/1/77.
3. **Frequency of issue:** Once per month.
   A. No. of issues published annually: 12.
   B. Annual Subscription Price: $15.
4. **Location of known office of publication:** *(Street, City, County, State and Zip Code) (Not printers):* *1501 Wilson Blvd., Arlington, VA 22209.*
5. **Location of headquarters or general business offices of the publishers** *(Not printers):* Craver, Mathews, Smith & Co., 1501 Wilson Blvd., Arlington, VA 22209.
6. **Names and complete Addresses of Publisher, Editor, and Managing Editor:**
   Publisher: Roger M. Craver, % Craver, Mathews, Smith & Co., 1501 Wilson Blvd., Arlington, VA 22209.
   Editor: Roger M. Craver, % Craver, Mathews, Smith & Co., 1501 Wilson Blvd., Arlington, VA 22209.
   Managing Editor: Roger M. Craver, % Craver, Mathews, Smith & Co., 1501 Wilson Blvd., Arlington, VA 22209.
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8. **Known Bondholders, Mortgagees, and other Security Holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities** *(If there are none, so state):* None.
9. **For completion by nonprofit organizations authorized to mail at special rates** *(Section 132.122 PSM).* Does not apply.

10. Extent and nature of circulation	Average no. copies each issue during preceding 12 months	Actual no. copies of single issue published nearest to filing date
A. Total no. copies printed *(Net Press Run)*	7,800	9,500
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	———	———
2. Mail subscriptions	7,248	8,930
C. Total paid circulation *(Sum of 10B1 and 10B2)*	7,248	8,930
D. Free distribution by mail, carrier or other means, samples, complimentary, and other free copies	192	237
E. Total distribution *(Sum of C and D)*	7,440	9,168
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	360	332
2. Returns from news agents	———	———
G. Total *(Sum of E, F1 and 2—should equal net press run shown in A)*	7,800	9,500

11. **I certify that the statements made by me above are correct and complete.**

ROGER M. CRAVER, *Publisher*

Undercurrent is published monthly by Undercurrent, Inc., 1501 Wilson Blvd., Arlington, VA 22209. Copies of this guide are not available on newsstands, but are furnished directly to the diving public by mail subscription only. Subscription cost is $15 per year. To maintain its independence, Undercurrent carries no advertising and is supported entirely by subscription income.

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the very cautious, grabbed a gorgonia to catch myself from rising too fast. Off snapped a small branch. When my buoyance changed from neutral to negative as I descended I was unable to control it quickly. I landed on a coral head, crushing some of the skeleton and the inhabitants. As I kicked from one sponge to another, the tip of my fin sheared a branch of staghorn. I cut open a sea urchin to feed the fish, but as I wacked through the urchin my knife blade dug into a mound of star coral, scarring it permanently. My buddy inspected the underside of a dead piece of coral, swimming away without returning it to its original position. The microscopic eggs once hidden beneath became immediate repast for the ever-watchful blueheads. God, how two people who do their damndest to preserve a magnificent reef, inadvertently contribute to its slow and painful death.

I offer my comments about the beauty of this reef with one caveat. I was able to make only two dives at the same spot, but my observations were corroborated by other divers who had been down the length of the reef, including a marine biologist who had spent the summer diving it. It was as virgin as anywhere the divers had been, they agreed, and the diving got better as they moved southward from where we had been diving. I made only one dive a couple miles north of the Chastenet and it was subpar. Only basket sponges, big enough to sit in, salvaged the trip. The other divers agreed. The action was south.

Junior runs a one-man shop, so when he has other business there's no diving. He may, however, have assistance in the winter. He operates from his home-cum-dive shop on the Castries yacht harbor. He has good equipment available for six divers, (including twelve tanks) and a tiny compressor which takes 20 minutes/tank; he expects to replace that soon. I arrived in St. Lucia Monday evening in mid-August. First thing Tuesday morning I called to arrange diving for the rest of the week. The chap who answered the phone said Junior would call back soon. I called throughout the day, never reaching Junior (I even tried his sister's house) and resumed my vigil on Wednesday. Junior called at noon, apologetic. He had been working on business problems; he was trying to get his new boat ready. I begged to dive that day, but he said it would have to be tomorrow, Thursday. I explained I was leaving Sunday, and had come to dive three tanks every day. Thursday we would do two tanks, he said, but Friday was out--he had business across the island--and only one tank on Saturday. No matter how I begged, even when aboard his boat, I was unsuccessful. Yet I was fortunate. Last month he was in Miami. Junior, by the way, is an amicable fellow, safe diver, and fine guide. He demands C-cards. He allowed us freedom to dive, but kept his eye on us. Underwater he positions himself with his feet above his head, at all times neutrally buoyant, ensuring that his fins or his body, never strike the reef. He sets a good example.

If I had pulled rank, I could have been in the water every day. When Junior picked us up at the hotel he said that we would have been diving nearby, but that someone had called from the Anse Chastenet, claiming he was with Skin Diver, and begging for tanks. The man sounded desperate, Junior said, but he was wary. "People show up all the time saying they're going to write stories about me, but nothing ever happens, even after I've given them free diving and boat trips. I'm tired of it so I'm going to talk with this fellow before I give him the tanks."

Twenty minutes after we arrived, Junior finished talking and signalled us to get ready to dive. "He's not from Skin Diver," he said, shaking his head. "Says he's from some new magazine I've never heard of."

"Sport Diver?" I suggested. "That's it, Sport Diver. But he's not with Sport Diver, he just knows some one there. He runs a dive shop in New York. Junior was disappointed. "See what I told you." On the boat ride back he lamented about how he would do just about anything for good publicity to improve his business. I nodded, thinking about getting only three tanks of diving in five days.

So, if you're considering traveling to St. Lucia, remember the potential difficulty of getting into the water. Junior claims he has more time to serve divers during the winter and I don't doubt that's correct. He says he'll soon have a larger boat in the water--the editor of the Buddy dived with him 18 months ago and he told him the same then--and when it's ready a dozen or more divers can be taken to the reefs. Junior has also been trying to get a dive concession at the Anse Chastenet, but so far management will hear nothing of it. Divers, it seems, are not of the same class as preferred guests.

Off the beat of the Hotel LaToc I had the snorkeling surprise of my life. A little, half-dead reef lies at the end of the beach, but otherwise the sandy bottom is littered with chunks of broken coral. Still, in ten feet of water I was greeted daily by a school of two dozen squid which permitted me to get closer than any squid I've encountered. I saw an electric ray on two different days, jawfish jutting from their pebble-lined homes, glassy sweepers and juvenile angel fish beneath the coral (five feet from the surface), redlip blennies holding on in the surge, and a standard assortment of reef fish. In shallow water we collected scores of dead shells--without hermit crabs--and in the process my buddy nearly put her hand on a foot-long scorpion fish perched 15 feet from the shore. A moment later a small octopus shot from one hole to the next, leading us to wonder what we would discover at spots where tourists don't daily dip their tootsies. We also considered telling management of our discoveries, explaining that for a few complimentary nights of room and board we would not share stories of the shallow water dangers with their unsuspecting guests.

I was pleased with the accomodations and courteous staff at LaToc, but displeased with the overpriced, poorly prepared food. Management claimed the problems were being corrected with kitchen improvements already underway. The best hotel, the Cariblue (winter rates over $100, double, similar to the LaToc) is 9 miles north of Castries, on the wrong side of the fine diving. Junior picks up on the LaToc beach, but from the Cariblue it's $5 taxi to the shop or you must take the infrequent hotel bus. Cars rent for $20/day and 35¢/mile. Less expense hotels ($40 and up) include the East Winds Inn, on the beach and rustic, or the Villa, on the hillside above Castries. Airport to hotel transportation should be part of your package; otherwise it's $23.

St. Lucia is a beautiful island, covered with tropical rain forest and accented by two magnificent peaks, the Pitons, which rise side-by-side from the ocean on the island's edge. Bananas, papayas, coconuts and mangoes grow along the roadside. Nearly every houseplant you cultivate back home, grows tall and wild here. The town of Castries has little tourist business, so it remains unique. The natives are friendly, too. Rain, a delightful little restaurant with white walls, white wicker chairs, and overhead fans, could have gotten our business nightly--curries, with homemade chutney, spareribs, fish, fresh mango ice cream, and hearty drinks. $20+ for two here, including spirits, but $10+ for two at the Calabash for plain and simple native comestibles. Overall, St. Lucia is very expensive. It is also unspoiled. For now.

You may reach Junior Alcee by writing Box 412, Vigie, Castries, St. Lucia. His phone is 4127. He charged us $25 each for two tanks each, plus $15 for "The boat," a sum a bit exhorbitant. Write ahead.

I admit to one gap in my story. The Halcyon Days Hotel, located on the rougher Atlantic side, offers guided diving. Apparently there is no boat available, but two Undercurrent readers have completed questionnaires on their visits, and both report the guide brought them by truck to the Anse Chastenet. They gave very high marks to the dive, although the hotel is at the wrong end of the island for most tourists. But the real story about St. Lucia is that someday, someone will most likely turn the 18-room Anse Chastenet into a diver's

hotel, probably after reading this article. The unspoiled reef will become accessible to all of us, so make your trip as soon as it opens. You and divers who follow will quickly destroy the reef and that's a damn sad fact.

Organizing Divers:

There's more to it than calling a meeting.

Many readers have written, asking how to start a dive club. Others, no doubt, wonder why they bother to belong to one.

Starting a dive club is not difficult. Sustaining one can be. That's where organization and management skills, persistence, and a dose of creativity are required. But, before we consider how to keep it together, let us give you some ideas about how to get it together.

The first requirement of any club is getting members. Local dive shops are the primary social centers for divers and they are also your best targets for recruiting both long-time divers and the newly certified. Dive shops have a great stake in clubs—clubs keep people interested in diving, and only active divers spend money—and many shops are willing to share their customer rosters with you.

Shops are particularly aware that a majority of new divers drop out soon after certification. So, to keep new divers interested in the sport—and to maintain their supply of new customers—it's in a shop's best interests to see that new divers get involved with an active club.

To be sure, there are other sources of membership. You can start with your diving buddies. Members may also be recruited from conservation organizations, the marine biology department of your local college, the YMCA or other recreation clubs.

None of these, however, are likely to be as valuable as your dive shop. Keep in mind this advice from Richard Peralta, president of a club in the Canal Zone: "Be very careful trying to make new divers out of your friends—you're better off making new friends out of people who already like to dive." And don't be afraid to start small. If your club is worthwhile, it will grow.

What's First?

Many people in the throes of organizing a club believe that the next requirement (after recruiting members) is a charter, usually a complex affair that takes about the same amount of time to draft and ratify as that our founding fathers needed at the Constitutional Convention. Devoting your first meetings to haggling over procedural matters is the quickest way to turn off people who came to enjoy their sport.

Instead, devote your first sessions to planning dives—to selecting sites, organizing transportation, and making other necessary arrangements.

> ***'Be very careful trying to make new divers out of your friends—you're better off making new friends out of people who already like to dive.'***

Keep It Simple

After they've been in the water together a few times, club members might decide they need some rules for operation—rules to prevent disputes and rules to settle disputes. If you insist on the formality and language of a charter, and the accompanying trappings of a formal organization, leave the paperwork up to a committee of bureaucrats, requiring them to bring their recommendations to a future meeting. You're best off sticking to simple rules like: "Decisions are made by majority vote and one-third of the members must be present." Begin with a minimal number of rules of operation; you can always add more as you need them. Forget all the other crap, including Robert's Rules, and enjoy yourself.

Responsibility for different club activities should

In the June issue of *Undercurrent*, we requested articles from our readers on how to start a dive club. We received several responses, but none was sufficient by itself. Three, however, were filled with a number of ideas to be shared by those interested in starting and maintaining a dive club. The contributors were Joe Arnstein (Portsmouth, New Hampshire), Henry James Butler (Gainesville, Florida) and Richard Peralta (Balboa, Canal Zone). Using their articles as a base, we added information from interviews with leaders of several dive clubs and from our files. Arnstein, Butler and Peralta were each given a one-year renewal and sent $20 for their contribution.

be spread among as many members as possible; even the most recalcitrant should be encouraged to take on something. Assign responsibility according to members' particular skills. A good diver might assume dive leadership, but a good organizer is needed to plan the trip. Whoever runs the meetings should have the skills the chair demands. If there is to be a newsletter, it should be prepared by someone who will enjoy writing it. And, most important, *one person* should be continually responsible for following things up, to make sure the various tasks are being accomplished. An effective leader spends his time establishing objectives, assigning responsibility, and then providing assistance and regular follow-up to ensure that the jobs are being done. A club that cannot get its members to assume responsibility must first take a look at its leadership before criticizing its members for being deadbeats.

Maintaining a Club

Once you're organized, maintaining interest and activities becomes the challenge. To maintain a club, there's but one rule—meet the needs of your divers. The most basic need is to get into the water, and dive trips should be scheduled often enough and with enough variety to satisfy all of your members.

Plan difficult dives and easy ones; dives where the nondiving family members can enjoy themselves on the beach, and dives only for the serious diver; dives which require overnight trips, and, if possible, dives which can be made in a morning; dives where you search for artifacts and dives where you look for fish; dives everyone likes and dives no one has ever taken. Use your imagination.

Another diver need is simply social. Picnics, parties and other events where no one dives may be important to many members and can help keep the club together. Remember, sometimes divers would rather talk about diving than get wet, so help them out, too.

A third need is a bureaucratic one, a need to have meetings, to write charters, to create committees, to develop a structure, to have power. Some people organize clubs to meet these needs and some clubs, originally organized for diving, are quietly taken over by bureaucrats. If that happens to your club, get the divers together and organize another one.

Finally, some unique club activities might help maintain an otherwise sleepy organization. Consider these possibilities:

- Buy a compressor or a boat for more remote dives. Money can be raised from members and special events. Perhaps a wealthier club member could buy the equipment, with the club paying him back monthly, with interest.
- Construct an artificial reef to bring fish to your area. For the details, including the materials, the appropriate laws, etc., write to Richard Parker, National Marine Fisheries Service, Atlantic Estuaries Fisheries Center, Beaufort, North Carolina 28516. For no charge he'll send you *How to Build a Marine Artificial Reef,* a NOAA publication he and several others authored.
- Organize club courses for advanced diving, marine biology, ice diving, night diving, etc., using your own qualified members as instructors or obtaining instructors introduced to you through your dive shop. Charge a fee to pay for the course and maybe skim a little for the club.
- Get publicity by cleaning up a local lake, river, or beach. Prior to the clean-up, solicit donations from merchants whose trade might be affected by the dirty water. Use the money to award prizes to the diver who finds the most junk, the most worthless piece of junk, the most usable, the most bizarre, or the most valuable. Tell the local paper because the story will make good copy.
- Get into the salvage business, with a club-owned boat, lift bag, or whatever.
- Use a local pool in bad months for craziness (e.g., underwater hockey, monopoly, etc.) or for experimenting with new equipment.
- Organize an underwater photo competition and if the pictures are top quality, seek a display or hold the competition in a local gallery. Have a wine-tasting at the gallery in their off hours and let the members judge the pictures. Entice the gallery by telling them that they might sell other photos to those who attend.
- Volunteer as divers for the local college, for the Coast Guard, for search and rescue, or for local pollution control.
- Get the fish and game department to plant fish where you dive, agreeing to provide them information on their development.

Clubs Have Clout

The greater the size of the club, the greater the clout. First, ask your dive shop to provide all the air your members can use at some flat annual rate, say $20. If a 30-member club puts $600 into the hands of a dive shop in the slow month of January, you may have a deal.

Arrange for members to make all their purchases from one shop, the shop which gives you potential new members. For all the business, seek a discount on purchases of 10% or more.

Don't overlook the foreign travel possibilities. With 15 people traveling to the same destination, the 16th will fly free and get free accommodations, food and diving at your destination. Divide the savings among club members, give it to the organizer, or give half to the organizer and award the other half as a prize for something. If you can't fill all the slots, ask your dive shop or another club to help.

Remember, then, use the minimum organizational structure possible, assign responsibility and follow-up, and spend your time diving. The purpose of a club is to have a good time diving, contributing to your community and saving money at the same time. For those who want to spend their energy on meetings and in committees, send them diving without a buddy.

Note: The Underwater Society of America is a national nonprofit association of dive clubs and indi-

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viduals with the purpose of promoting sport diving. They produce a number of publications which new clubs will find useful. For information write Harold Drake, Executive Secretary, Underwater Society of America, 732 50th Street, West Palm Beach, Florida 33407. The phone number is 305/844-1124.

In and Out, In and Out, In and Out:

Putting regulators to the test.

One of the first questions a newly certified diver asks his instructor or his dive shop manager is: "What regulator should I buy?" He can expect any number of answers, but probably the soundest general advice is to buy the best regulator one can afford, regardless of the manufacturer.

The more expensive a regulator you buy, the more likely you are to be purchasing a dependable device which will serve you well under adverse circumstances. The converse is true. The less you pay for a regulator, the more likely you are to be buying a unit that may not give you what you need—unrestricted air flow—when you need it.

Regulator failure due to a manufacturing slip up is rare. Quality control procedures by manufacturers will catch just about every factory error. Regulator failures due to the owner's faulty maintenance, however, are common, because a regualtor which is not professionally overhauled regularly is bound to have bad o-rings or rusting parts which can restrict or even stop air flow.

Another Cause of Failure

Regulator failure due to design deficiencies is common if the regulator is pushed beyond its capacity. The better regulators deliver the air a diver needs at whatever depth he finds himself, regardless of the work the diver is performing. Poor regulators, which may seem to work well on the surface, can't deliver the air a diver needs at every depth and workload.

The most important criteria, then, in determining the quality of a regulator are the resistances the diver experiences to inhalation and exhalation at varying depths and with different workloads being performed. The easier it is to breathe, the less energy the diver needs for breathing. The less energy he expends, the less tired he becomes and the less air he uses. That means longer bottom time.

At some point, the resistance to inhalation can become so great that the diver will no longer be able to draw sufficient air from his tank. When a tank is down to less than 500 lbs., a poor regulator may provide *no* air at 80 feet to a hard working—or struggling—diver. A good regulator may be easy to use if down to the last pound of air at 200 feet—but God help you!

There's hardly a shop or salesperson around who can give you this information about regulator performance. Divers are left to rely on their own experiments with regulators, sales claims and the word of a good buddy. You may never know, however, whether the regulator will perform when you're struggling for your life. That's why buying the best regulator you can afford is the safest insurance.

The data on regulator performance is generally not available because the cost of the equipment needed to test regulators is astronomical. In fact, only the U.S. government is able to afford it. The U.S. Navy has been testing regulators for many years, and the results of that effort provide all the information a diver needs to make an intelligent decision about which regulator to purchase.

The Navy Experimental Diving Unit

In Panama City, Florida, the Navy Experimental Diving Unit (EDU) evaluates both hard hat and sport diving equipment. For several years, the EDU has tested regulators to determine which are acceptable for military use. The EDU employs sophisticated equipment valued at over $200,000 to measure inhalation and exhalation resistance under varied workloads at depths simulated to 300 feet.

J.R. Middleton, the EDU test engineer, told *Undercurrent*: "Almost any regulator on the market will work fine when you are swimming along at 30 feet. What we are interested in determining is which one will work fine when you are at 150 feet and fighting for your life."

The U.S. Navy has set standards for regulator performance and tests nearly all commercial regulators to see which can meet the performance requirements. Although they use sophisticated testing equipment and hundreds of man hours in testing (224 man hours in the case of the two Sherwood Selpac regulators reviewed in the following article), their procedures have been criticized because they test only *one* model. The test regulator is purchased by an EDU member at a local dive shop. If preliminary tests show the regulator has a problem, it is returned to the dive shop for adjustment, repair or replacement.

If the regulator passes EDU tests and meets military standards, it is approved for purchase. It remains approved until the regulator is no longer manufactured or until problems are reported from users and further testing is required. Once on the market, regulators are seldom altered significantly. But if a manufacturer does make significant changes, the redesigned model is not approved until tested again.

A specific brand regulator is tested for two reasons. Someone at the EDU or in the military decides a specific regulator should be tested because advertising, articles or users claim superior performance. Also, a manufacturer might like to sell its regulator to the Navy and so it requests EDU to conduct tests to secure approval.

Engineer Middleton, who writes the Navy test re-

ports, told *Undercurrent:* "The basis for our present testing was established in 1969 and the minimum standards were set so that only a few regulators could be expected to be approved. Most regulators made today would meet the minimums, so we are in the process of upgrading these minimums so that again only a few will make the list. While we do not necessarily feel that a regulator must meet military minimums to be acceptable, we do feel that the evaluation and testing given regulators is sufficient for the sport diver to make an intelligent comparison when the time comes to buy a new regulator."

A Navy diver may put greater stress on a regulator than most sport divers, but not always. A high percentage of sport divers descend beyond 100 feet, and some dive regularly to 150 feet. Sport divers struggle in deep caves to pick scallops, bring heavy anchors up from the deep, or fight against strong currents. A sport diver in trouble will work hard to get out of it. He needs a regulator to perform. He needs a regulator to pull that last pound of air from his tank. Because many regulators meet Navy standards, there's no reason to buy a regulator which does not meet these high standards.

Undercurrent has decided to condense and publish the EDU reports, as they become available to us, and publish abstracts of older reports for regulators still on the market. Our first test report is on two Sherwood Selpack regulators, the 4100J and the SRB 3000. The 4100J meets EDU standards; the 3000 does not.

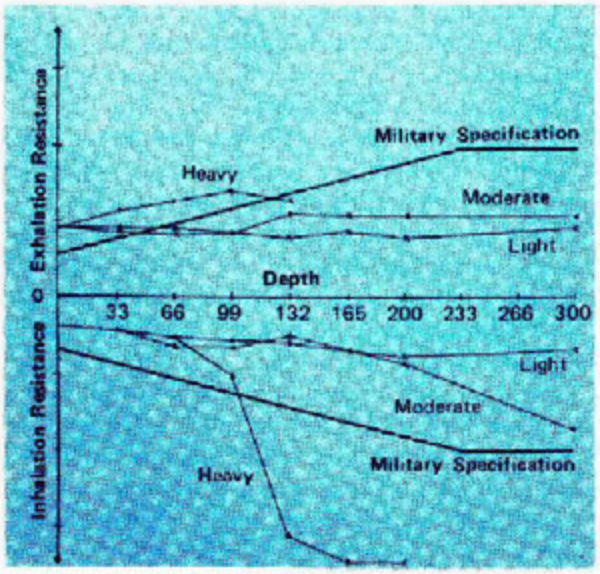
Laboratory Tests of Sherwood Selpac Regulators:

We vote Aye on the 4100, Nay on the 3000.

Last April, the Experimental Diving Unit reported on its test of two regulators manufactured by Sherwood Selpac Corporation: the SRB-4100J and the SRB-3000. We have rewritten and summarized their reports so that the average sport diver can understand the performance ratings without having to wade through excessive technical data.

Test Plan: The two regulators were tested in the EDU breathing machine at depths to 300 feet. The machine simulated a light workload, a moderate workload and a heavy workload at increasing depths.

The Regulators: The 4100J regulator has a balanced first stage with four low pressure ports and one high pressure port for a submersible guage. The 3000 has an unbalanced piston first stage, no reserve mechanism, three low pressure ports one one high pressure port. Both have identical second stages and although the second stage is normally tested by the Navy, the o-ring design on the first stage low pressure ports did not fit EDU test equipment.

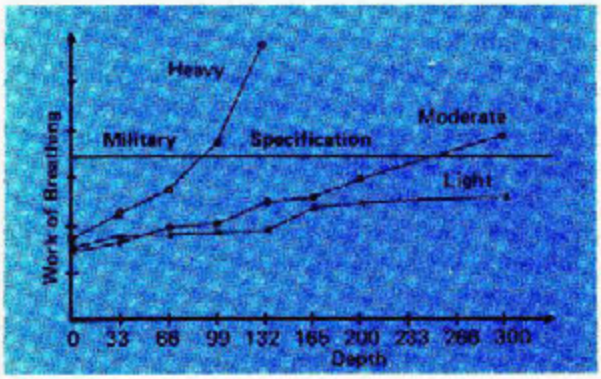


Breathing Resistance at Increasing Depths and Different Workloads—The Sherwood Selpac 4100J Regulator

The 4100J: When operating at light and moderate work loads, the inhalation resistance was well within military specifications and inhalation cracking pressures were very low. Inhalation flow was smooth and uniform. Under a heavy workload, the regulator stayed within the military limits up to a depth of 99 feet, but beyond that inhalation resistance increased dramatically.

The machine was then set to simulate two situations approaching "out of air": 200 psi and, as if the reserve remained, 500 psi. For a light workload, inhalation resistance was not affected either on the surface or at 200 ft. At moderate workload there was no significant change on the surface at either pressure. At 200 feet, there was no significant change with 500 psi remaining, but with 200 psi remaining, the resistance was so great that the test was terminated. The first stage reserve assembly operated properly by severely restricting flow at 300 psi or less, until it was switched on.

When operating at light and moderate workloads, the resistance to exhalation was well within military limits at depths beyond 50 feet. From 0 to 50 feet,



Work of Breathing at Increasing Depths and Varying Workloads—The Sherwood Selpac 4100J Regulator

resistance was slightly greater than allowed, but this is common in many regulators and for practical purposes does not affect regulator performance. Under heavy workloads, the exhalation was beyond military specifications at all depths.

A valid supporting test of performance is a measurement of the breathing work required to operate a regulator through *one* complete breathing cycle. The EDU has established a standard for the maximum external respiratory work allowable.

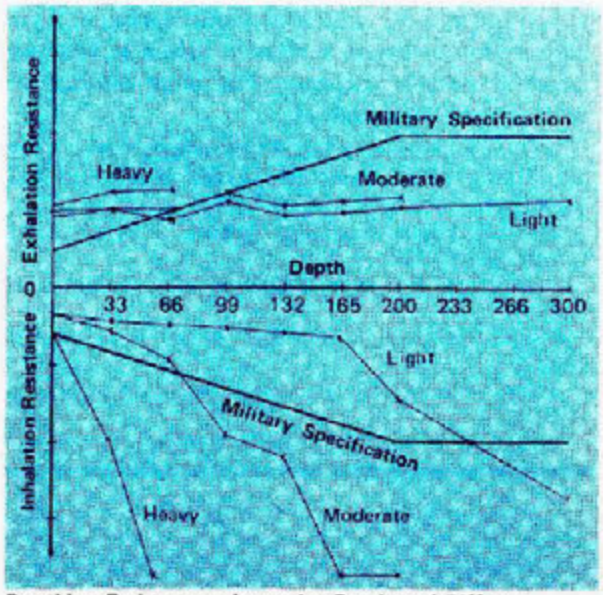
Low breathing work was required to operate the 4100J at light and medium workloads down to 99 feet. At greater depths, breathing work increased rapidly for the moderate workload and eventually approached the limits at 200 feet. Breathing work for the heavy workload exceeded the limit at 85 feet.

Conclusion: The Sherwood 4100J is a reliable and functional regulator which generally meets military specifications. It is recommended for U.S. Navy approval. However, EDU tests reveal two areas that, while not affecting overall performance or safety, nevertheless warrant improvement.

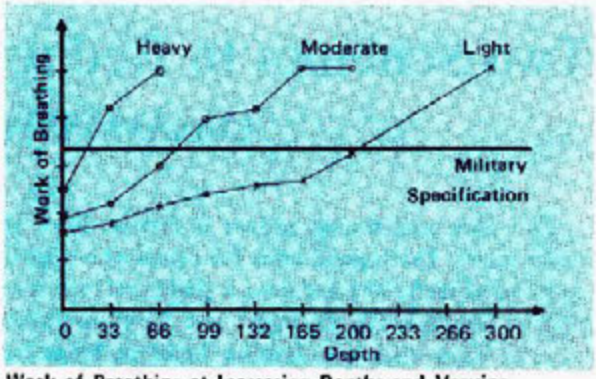
- High inhalation resistance at 200 feet with air supply at 200 psi. This could be improved by increasing the flow area in the vicinity of the reserve valve.
- At shallow depths, exhalation resistance exceeds military standards and exhalation pressure was unstable. Both problems are probably the result of bubble collapse at the exhaust port. This could be improved by a modification of the exhaust tee which would cause a bubble to be captured at the end of each exhalation cycle.

The Sherwood 3000 Regulator: When operating under light workload, the 3000 had a low cracking pressure and smooth, uniform flow, well within military standards. At the 200 psi tank pressure, breathing resistance slightly exceeded military specifications.

At moderate workload, the inhalation resistance exceeded military limits at 70 feet. Beyond 70 feet,



Breathing Resistance at Increasing Depths and Different Workloads—The Sherwood Selpac 3000 Regulator



Work of Breathing at Increasing Depths and Varying Workloads—The Sherwood Selpac 3000 Regulator

exceeded military limits at 70 feet. Beyond 70 feet, resistance increased drastically and was completely inadequate for meeting a diver's needs at 165 feet.

Under heavy working conditions, the regulator exceeded military limits at all depths. Because of excessive resistance, the test was terminated at 66 feet.

The exhalation characteristics of the 3000 were almost identical to those of the 4100J. This was expected because the second stages of the two are identical.

The breathing work required to operate the 3000 at light workload was not excessive until 200 feet was reached. At moderate and heavy workloads, the breathing work required increased rapidly with depth, exceeding the limit at 70 feet and 17 feet, respectively.

Conclusion: Because of extremely high inhalation resistance, the Sherwood SRB-3000 regulator does not meet military specifications and is not recommended for military use. This regulator was seriously deficient on inhalation under all operating conditions except those involving light work at shallow depths. Since the second stage of the SRB-3000 is the same as that of the SRB-4100J, the 3000's problem appears to involve its first stage. Consequently, the piston and associated flow passages of the first stage of the 3000 should be redesigned.

Undercurrent Comments: The reader should easily be able to draw his own conclusions. Our conclusion is that the 3000 belongs in swimming pools. We would not want to be using a 3000 under adverse circumstances at depths greater than 60 feet.

The 4100J stacks up well against many other regulators on the market and should meet the needs of all but the most foolish of sport divers. It meets military needs and will certainly meet yours.

The 3000 retails for $110; the 4100J for $150; the 4100K, identical to the J, but having no reserve, sells for $140.

Note: John Canna, Sherwood Selpac engineer, told *Undercurrent* that no changes have been made in either regulator since the Navy studies. Sherwood Selpac is also marketing a model 2000 regulator which retails at $90. Mechanically, it is the same as the 3000 and therefore the EDU test results are identical for both the 2000 and the 3000. Canna said this regulator line is directed toward classroom and rental use.

Two Schemes to Reduce Your Travel Bill:

Condominium time-sharing and home exchanges.

The price war among airlines is driving down air travel prices. That's good news for divers who long to cruise coral reefs. The bad news is that hotel rates continue to escalate. So, we might save $100 on airfare only to learn that our favorite hotel or lodge has boosted prices $10 a night since our last trip.

There are three ways to get around the upward spiral. They're not for everyone because they require you to have money before you can save money.

Condominium Ownership and Time Sharing

Owning a condominium on a tropical island is a popular second-home scheme for people with money. (A condominium, or condo, is an apartment within a complex that you buy and finance like a house, while you pay a management fee for maintenance and security. Backers say it combines the advantages of home ownership and apartment renting.) Condos are available, for example, on all the Hawaiian islands, in Mexico, and on many Caribbean islands. In making such a second home purchase, a major consideration will be whether the condo can be rented when you're not using it. A vacation home which sits idle eleven months a year is a very expensive way to guarantee accommodations for yourself at your favorite dive spot.

But a new scheme is gaining popularity. Under a time-sharing condominium ownership plan, a purchaser buys a share of a condo according to the number of weeks he intends to use it annually. If it's one month a year, he buys 1/12. The times he uses the condo are worked out in the purchase plan, and can be negotiated among the owners in subsequent years.

Time-sharing plans begin with a purchase price of roughly $3000 (since this is an investment, you might even foresee some growth in value) and require an annual maintenance fee. In return, you're an owner, and while you're using your condo, you and your guests have access to all the facilities. These surely include a swimming pool and might even include a private golf course and club.

A variation on this scheme makes it even more appealing. An organization called Resort Condominiums International operates a data bank in which nearly 50 condominium resorts participate. Full or time-share owners in these resorts may list their condos with the data bank for use by owners at other resorts. In return, they may take a vacation at *any* of the 50 or so other resorts represented. If, for example, you own four weeks a year on Maui, and you decide you want to spend two of those weeks at the Third Turtle Inn in the Turks and Caicos Islands, you can make the trade through the RCI data bank. You pay an annual $36 membership fee, plus $7 a night cleaning charge for the use of the condo you're trading for. More information about the program is available by writing RCI, 5638 Professional Circle, Indianapolis, Indiana 46241. RCI has member resorts in Florida, Colorado, Hawaii, Aruba and Spain, with more coming.

A second resort condominium time-sharing corporation is Vacation Internationale, Ltd. (P.O. Box 1970, Seattle, Washington 98111). It represents condos on several Hawaiian islands, in Puerto Vallarta, Sun Valley and on some Caribbean islands.

Home Exchanges

If you can't afford to purchase a condo to enhance your diving opportunities, another option may interest you—temporarily exchanging your permanent home for one in the vacation area of your choice. Several organizations operate as clearing houses for people who wish to exchange their homes for short periods. By subscribing to one or another service for a $10 to $20 annual fee, you receive a directory in which scores of homes are listed in various areas which have good diving. The description of the home includes a list of areas the owner is interested in visiting, so if your home happens to be in one of those areas, you contact the advertiser and arrange the exchange. Because the transaction is reciprocal, users of the service almost always report that the people with whom they exchanged homes took the best of care of their property.

You can have your own home listed (sometimes an additional fee is charged) so that those who subscribe to the directory but don't list their homes can contact you. Your chances of making an exchange with a home on a tropical island depend mainly on your own location. As you might imagine, if your home is near ski country, you might find it easy to arrange a winter exchange with someone in Hawaii or Grand Cayman. If you live in a city with wide tourist appeal, or if you have a farm or live in a pleasant rural area, you may locate a suitable exchange. For more information, write to these organizations:

Vacation Exchange Club, 350 Broadway, New York, NY 10013 (This seems to be the largest and best organized)

Holiday Home Exchange Bureau, P.O. Box 555, Grants, NM 87020.

Adventures in Living, P.O. Box 278, Winnetka, IL 60093.

Aloha Exchange, P.O. Box 4529, Honolulu, HI 96813.

Loan-A-Home, 18 Darwood Place, Mt. Vernon, NY 10553

Homex, P.O. Box 27, London, England NW6 4HE

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*.