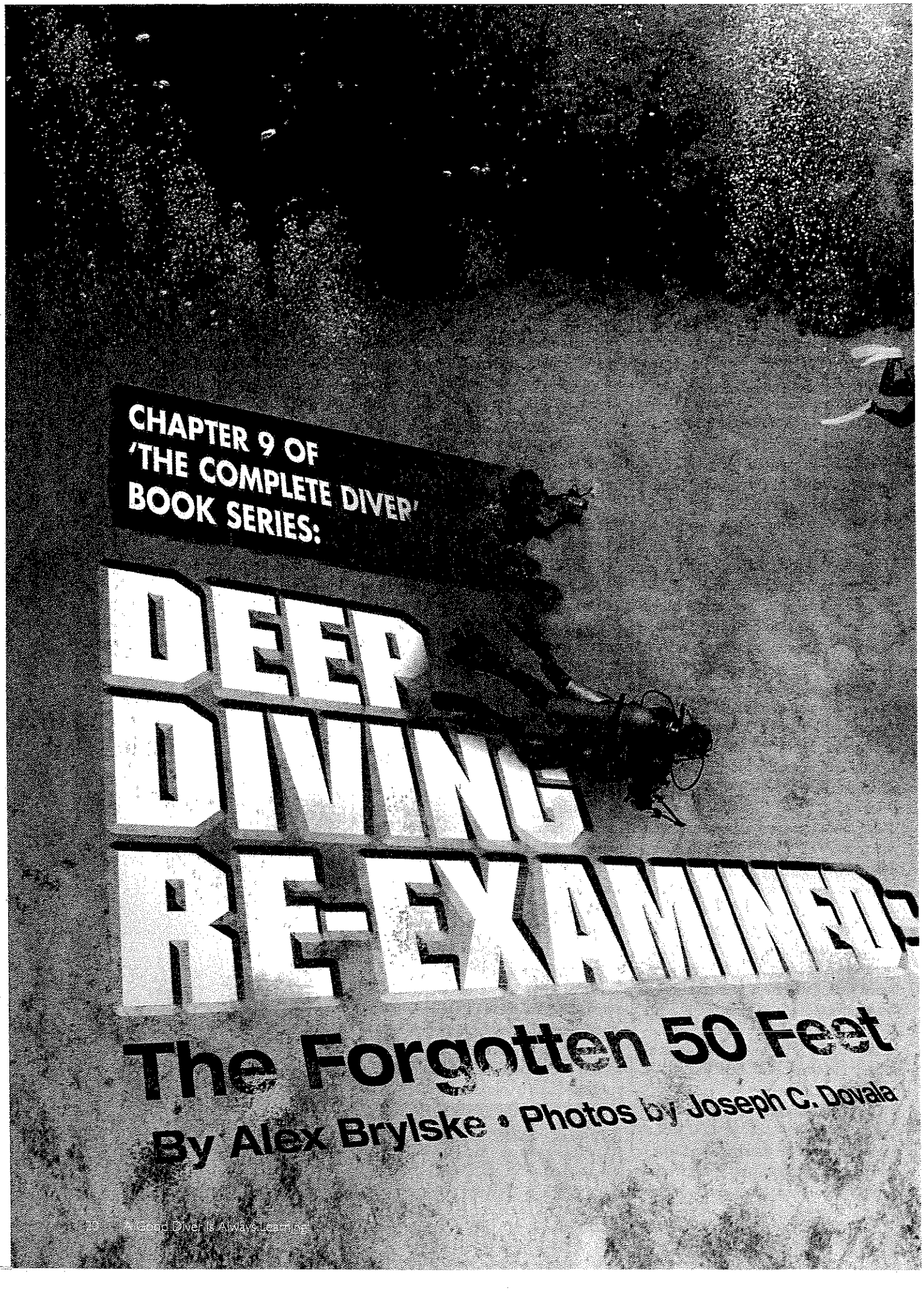

CHAPTER 9 OF
'THE COMPLETE DIVER'
BOOK SERIES:
DEEP DIVING RE-EXAMINED
The Forgotten 50 Feet
By Alex Brylske • Photos by Joseph C. Dovala

BONUS! BOOK EXCERPT

In celebration of Dr. Alex Brylske's 20th year as senior editor, *Dive Training* is pleased to present a series of excerpts from his forthcoming book, "The Complete Diver: What Your Instructor Never Told You."

An interesting phenomenon has occurred within the recreational diving community in recent years. In the past, divers were more or less a homogenous crowd; we all had far more in common than not. But that's no longer the case. We've become an extremely diverse group of folks with a wide variety of interests and motivations. On one end of the continuum are those whom I call the "occasional divers" — people who enjoy diving on a limited basis and are happy to confine their underwater forays to shallow tropical water conditions. Rarely will you find this bunch below 60 feet (18 m). The other end of the continuum is reserved for that new breed we now call technical divers. These are the folks who invest as much or more in scuba equipment as they do in their car, and don't feel like they've been diving unless they've had at least 200 feet (61 m) of water over their head.

Of late, much of the diving industry's attention has been focused on these two important and growing segments. Such attention, I believe, is a good thing because each group has much to teach us. The occasional divers, for instance, have shown us that if diving is to grow and prosper, we must provide a higher level of service and supervision than in the past. Conversely, technical divers have helped push the envelope and bring new innovations into the recreational community.

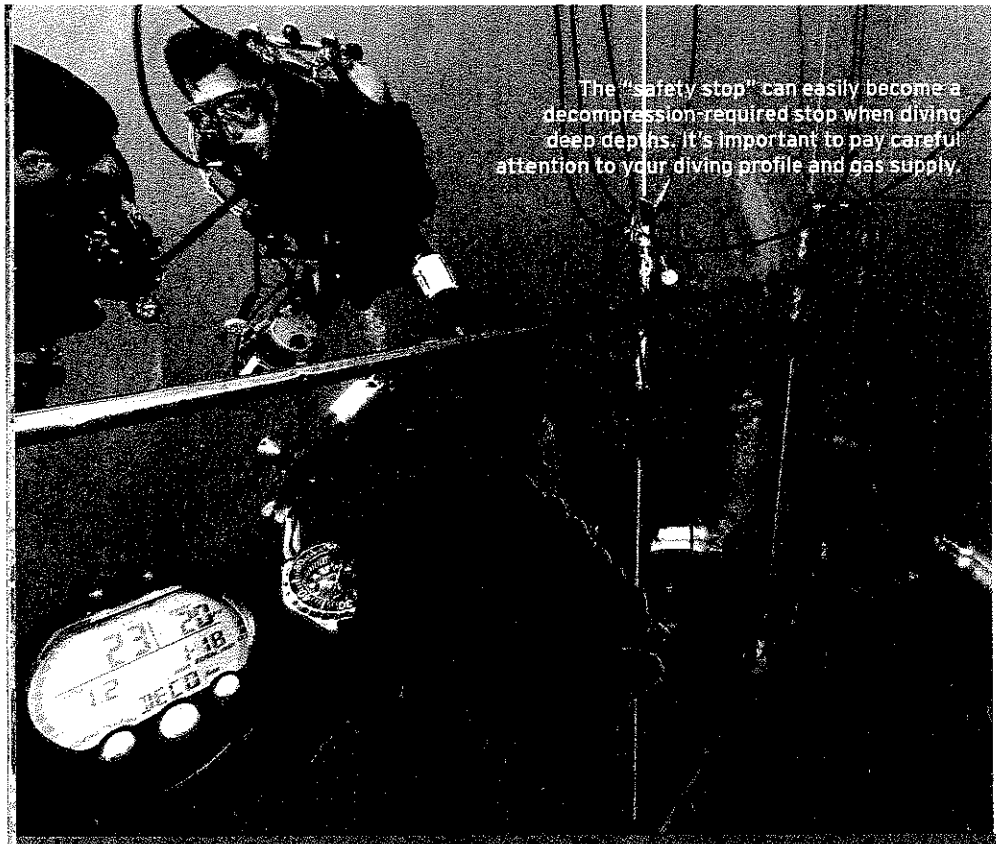
There is one downside to this attention, however. What about those of us in the middle? I, for example, consider myself neither an occa-

It's important to maintain your depth gauge. Even on wall dives or you could find yourself descending deeper than your planned max depth.

sional diver nor a techie; and I sometimes wonder if we haven't forgotten this silent segment of diving. A case in point is deep diving. What exactly should a diver — who is far more than a novice but with no desire to become a techie — know to dive safely in the deeper recreational diving range?

What Is Deep Diving?

The first step in answering the previous question is defining the term "deep." Almost every discussion of deep diving that I've ever read includes an admonition that deep is a relative term. So, to some divers 50 feet (15 m) may be deep, while to others it may be 150 (45 m). Indeed, environmental conditions and personal experience make a huge difference in assigning a meaning, but the quick-and-dirty definition — according to most diver training organizations, at least — is that a deep dive is any excursion below 60 feet (18 m). The rationale for 60 feet is that it's the point where no-decompression limits drop off dramatically, where due to the distance from the surface, out-of-air emergencies become much more problematic and the point where, albeit few, some divers begin to experience mild signs of narcosis. Frankly, I've never bought the 60-foot argument and I don't believe most other experienced divers have either. I've opted instead for a somewhat deeper definition of 80 feet (24 m). And my rationale isn't theoretical nor arbitrary, but statistical. In reviewing the diving accident data published by the Divers Alert Network (DAN) over the years, 80 feet seems to jump out as the point which — as the old map makers use to ascribe to unexplored areas — "beyond this, thar be dragons." For whatever reason — and I make no claim to understand why — the risk of accidents seems to increase substantially once divers exceed this depth. (In the "for what it's worth" category, this is also the rationale for why I rarely choose to exceed 80 feet when making a repetitive dive.) So, for the purpose of our discussion, I'll define



The "safety stop" can easily become a decompression-required stop when diving deep depths. It's important to pay careful attention to your diving profile and gas supply.

ALMOST EVERY DISCUSSION OF DEEP DIVING THAT I'VE EVER READ INCLUDES AN ADMONITION THAT DEEP IS A RELATIVE TERM.

deep diving as any excursion between the depths of 80 and 130 feet (39 m) — the forgotten 50 feet where occasional divers have no business (unless supervised) and no techie worth the price of his oxygen analyzer cares to stop.

The Mind Game

I'll start with an assumption that you first of all have a good reason to visit the forgotten 50 region, such as a worthwhile dive site. Deep diving simply to satisfy some macho urge or earn testosterone-induced bragging rights is nothing short of stupid; and if that's your motivation might I suggest that you find some other way of injuring or killing yourself that won't reflect on the safety record of scuba diving. The next issue after having a legitimate reason is, should you? A big part of diving is psychological, and deep diving is where head games really come into play. Any candidate for deep diving must have the requisite confidence, experience, self-reliance and common sense. It's not an environment where you can afford to make mistakes or defer to others in case there's a problem. Remember, compliments of our old nemesis nitrogen, psychological factors can be magnified — or suppressed — by the physiology of deep diving.

While a sound mind is the first prerequisite, it's equally important to have a sound body. Certainly you don't have to be a conditioned athlete to be a deep diver. (If that were the case, there'd be very few deep divers.) But if you consider a walk around the block a challenging physical task, it's probably best that your depth gauge never break the 80-foot mark. The time-tested measure of fitness that I have given on numerous occasions is the ability to swim 800 yards/meters with mask, fins and snorkel in 20 minutes or less. It's not a killer requirement, but I've found it to be an outstanding indicator of aquatic physical fitness. And if you can't do it, it doesn't mean that you can't be a deep diver. It just means that you have some conditioning ahead of you before you try.

Training vs. Trial and Error

Clearly, the best way to be oriented to deep diving is through a formal course of instruction. Every advanced diver course that I'm aware of includes at least some exposure to deep diving, and entire specialty courses exist that provide a much more in-depth (no pun intended) education. The advantage of formal training is that you'll not only gain experience under professional supervision, but you'll also explore the theoretical background necessary to truly understand the full nuance of diving in the forgotten 50 feet. There's also much to be said for having the safety net of a certified instructor if you make a mistake.

While formal training is the ideal, the reality is that most deep divers do not take a formal course. Most, I hope, are oriented to this unforgiving environment by more experienced friends. But the fact remains that a large number of divers still use the "this looks easy, so I'll give it a try" method. And while I hope everyone who reads this will take away something of value, it's to this last category of the would-be self-taught that I focus this discussion.

Who and When

I believe that no one has any business even considering deep diving until they're completely at ease diving more than 60 feet. For some, this could mean only a few dozen dives. Others, no doubt, need two or three

times this amount of experience. It's a question that only you can answer, and it's not one where you want to be less than truthful with yourself. It's also a good idea to build up to deeper depths progressively. One important lesson we've learned from the technical diving community is that progressively deeper rehearsal dives are a great way to acclimate to this more challenging environment.

Another vital aspect of character for deep divers is self-discipline. The simple fact is that lazy divers probably won't exercise the judgment and discipline needed to mentally rehearse the dive (another contribution from the technical community that I'll discuss later), check and recheck equipment, monitor their buddy, and diligently keep track of decompression, depth and air status. Deep diving is one arena where being considered anal retentive is a compliment.

Yet another important consideration is the person who'll be accompanying you. In deep diving, the wrong buddy isn't just a nuisance; he can be downright dangerous. Competence as a diver, good judgment and self-reliance go without saying, but there's a bit more to choosing a buddy for deep diving. The forgotten 50 is the last place you want to be with someone you don't know well. Therefore, you should always select a buddy with whom you've dived extensively. This prior experience is important in establishing what could be termed a "behavioral baseline." Having this baseline — knowing what's normal behavior for that individual — is really the only way you can detect subtle but significant changes in his behavior at depth, which could indicate the onset of narcosis or other problems.

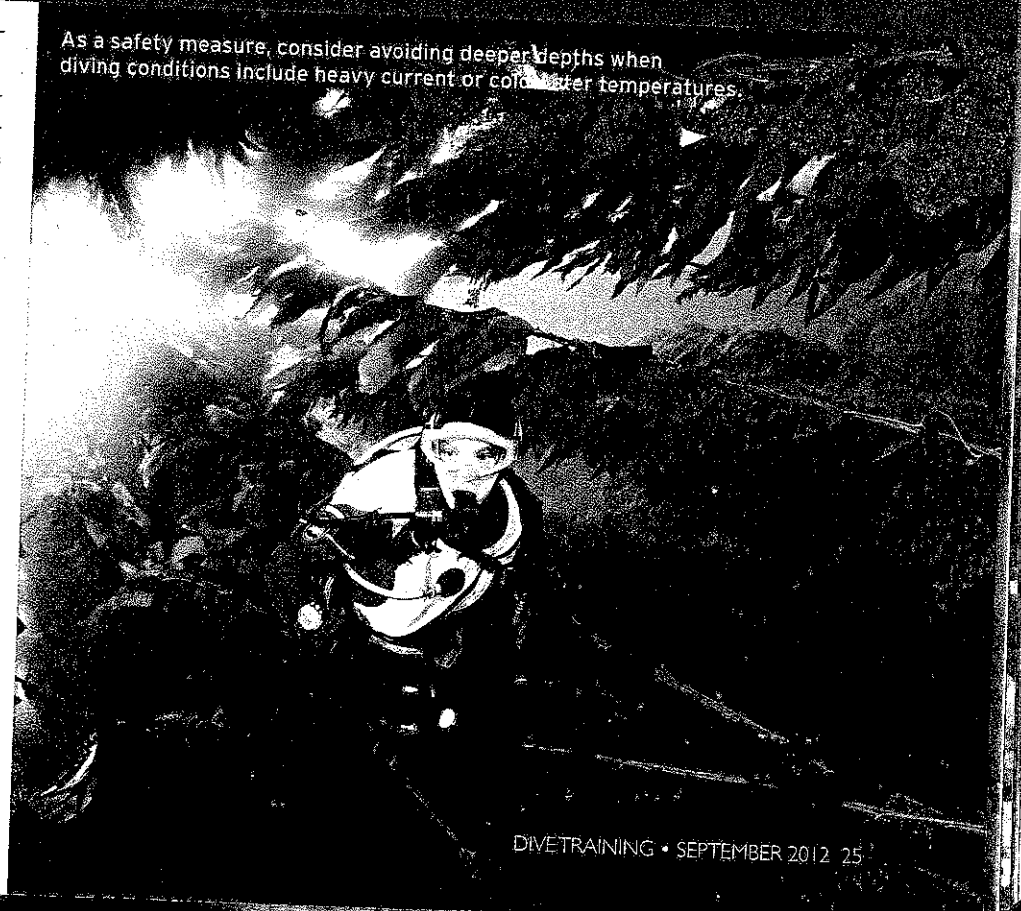
The Toys

As we're still within standard recreational diving depths, there's no special equipment required for diving in the forgotten 50. But there are some special considerations for that equipment. The first involves exposure protection. If you're diving in an environment where exposure protection is necessary, remember that because of the increased pressure at depth, suit compression becomes a factor. In other words, that 6-millimeter suit, which was toasty-warm at 50 feet, may not do the job at 120 feet (36 m) simply because the neoprene rubber, which is full of gas bubbles, is a lot thinner. A serious deep diver may well consider the advantage of a dry suit. Tropical divers, as well, should take note that increased depth often means decreased temperature. So, while a T-shirt might be the uniform of the day near the surface, something more substantial is often necessary at depth.

A few words are also in order regarding regulators. Frankly, virtually any regulator on the market will do the job adequately in shallow water. Not so when deep diving, however. The increased pressure at depth causes a concomitant increase in the density of the air you breathe. Therefore, like a racecar, a regulator for deep diving should be of the highest quality and maintained in a flawless condition. If you're not sure about the adequacy of your own system, a long talk with a knowledgeable person at your local dive center is probably a good idea.

Special attention is also warranted with respect to your gas supply. (I use the term "gas" rather than air because of the popularity of enriched air ni-

So, to some divers 50 feet (15 m) may be deep, while to others it may be 150 (45 m). Indeed, environmental conditions and personal experience make a huge difference in assigning a meaning, but the quick-and-dirty definition — according to most diver training organizations, at least — is that a deep dive is any excursion below 60 feet (18 m).



As a safety measure, consider avoiding deeper depths when diving conditions include heavy current or cold water temperatures.

trox.) The key to gas management begins with tank capacity. The general rule regarding gas supply is that you can never have too much. For example, at 100 feet (30 m) you'll be using air at least four times faster than at the surface, and twice as fast as at 30 feet (9 m). If deep diving is likely to become one of your common menu items, consider a larger-capacity tank. Like the fuel supply of an aircraft, you want to maintain a substantial portion of your air supply — 15 percent to 30 percent — in reserve for unexpected circumstances. Although they're a bit heavier and bulkier, high-volume tanks are available.

The most serious and significant emergency consideration in deep diving is running out of air; and this requires some thought beyond use of the standard alternate air source or octopus. Indeed, as in all diving, these devices are considered essential, but the question arises in deep diving: Are they adequate? Standard alternate air sources — spare second stages — do work but with one serious caveat: The diver providing the emergency air must himself have enough air left in the tank for both divers to reach the surface. As this may not always be the case, the answer for many deep divers is a redundant air supply. This may include a pony bottle — a small-capacity tank secured to the side of the main tank — with an independent regulator or a self-contained system like the Spare Air® (a small integrated tank/regulator device).

The Plan

As in any dive plan, the first consideration is that of the environment. Deep diving is not an activity you want to engage in when weather and water conditions are anything but good to ideal, particularly while you're still in the learning curve. Additionally, deeper dive sites are often situated in the most exposed locations, making them especially vulnerable to fast-changing or less-than-ideal weather conditions.

As most deeper sites are well off shore, you'll probably be diving from a boat. In the less common circumstances in which you may be shore diving, take care to factor into your plan the distance you'll have to swim. This could be an important issue in reducing the risk of decompression illness — due to post-dive exertion — and delay in the event of an emergency. It's also best to have a qualified individual remain at the surface at all times in case assistance is required. (This is a good idea any time you're diving from a boat.)

Because your bottom time will be significantly less than for a shallow dive, it's important to review your planned dive profile. Most experienced deep divers today use dive computers to assist in managing their profile, but you should never depend entirely on technology to keep you safe. Spend a few minutes familiarizing yourself with your intended profile in conjunction with a dive. This could be vital information in the event your computer malfunctions. Likewise, take the time to familiarize yourself with your buddy's computer and agree that the most conservative device will dictate the dive. (Because of the inevitable difference in dive profiles between divers, buddy teams should never share a single computer.) Finally, always bear in mind that the controlling factor in a deep dive may be either your decompression status or your air supply. This requires diligent monitoring of both factors.

To assist with the descent/ascent and to help maintain orientation, you should use some form of "downline" when deep diving. Often, the vessel's anchor line is used for this, but that may not be advised if a lot of line has been let out, especially if current is present. In fact, if the current is anything but mild, a separate descent line and surface float should be used. (Descending along a vertical line can be a lot less fatiguing than along the incline of a lengthy anchor rode.)

Ready, Set, Go

Because of the extra demands of deep diving, it's important that you and your buddy conduct a very thorough final check before entering the water. This predive check is generally no different from what you would do for any dive, but you should pay special attention to factors that might affect your air supply. First, verify that your valve is turned on completely. A partially opened valve will function properly at the surface, and possibly in shallow water, but will not deliver sufficient air at depth. (The telltale sign for this is to watch your SPG [submersible pressure gauge]; if the needle drastically fluctuates between near full to near empty with each breath, your valve is only partially open.) Next, confirm one more time that you have a full tank. When scuba units are assembled, tanks are often left on and unattended for long periods. Therefore, if a minor, unnoticed leak occurs, a substantial amount of air may escape. Your final predive check is also a good time to confirm that your computer has been turned on and is working properly.

You may want to spend the last few minutes before entry mentally preparing for the dive. Start by closing your eyes and breathing deeply and slowly. Next, visualize the dive (this can be especially effective if you've dived the site before). As vividly as possible, imagine what you expect the dive to be like. Include every phase of the dive, from the descent to the ascent. Imagine yourself and your buddy doing everything that you planned without error or omission. This may sound a bit too Zen-like to be worthwhile, but scientific investigation has confirmed the benefit of visual imagery in improving skill performance. This technique is used today by virtually all Olympic athletes.

Finally, don't fall into the trap of entering the water before you're ready. It's your safety and well-being, after all. Don't allow anyone — not your buddy, the divemaster, or even the captain — to rush you into the water unprepared. You, and only you, must decide when and if you choose to dive.

Down, Down We Go

Especially for those new to deep diving, a descent line is an important aid. It provides both orientation and control to your descent, which is often into a blue void where you can't initially see the bottom. This can be disconcerting, but there's no need to worry or hurry. The line allows you to easily halt your descent to readjust equipment, clear your ears or simply rest for a moment; and it greatly reduces the risk of being separated from your buddy. A "free descent" — where you literally fly through the water column with no reference — requires the competence and buddy coordination that comes only with experience. In poor visibility, or when the seafloor is silty, slow your ascent as you near the bottom. A crash landing will do nothing but destroy what little visibly might be present.

On the Bottom

Unless visibility is outstanding, you'll probably need to spend a few seconds getting and setting your bearings (a compass is an invaluable aid anytime you're diving a site where you can't easily ascend back to the surface for orientation). Because of limited bottom time, it isn't likely that you'll cover a large area during a deep dive, so navigation based on physical features is probably even more important than compass use. In very low visibility, when it's important that you ascend back up the line, consider using a line reel. Attaching a "travel line" to the downline will make returning home a simple matter of rewinding the reel.

Between the excitement of a new environment and the effect of nitrogen, it's easy to get distracted and forget to monitor your air and decompression status. Furthermore, you'll also be consuming air at a rate far greater than you're used to on a shallow dive. This means that extra diligence is absolutely essential. So, get in the habit of checking your instruments a lot more frequently than normal. Remind your buddy to do so as well.

Deep diving is also not the time to try and set any speed records. Because of the increased density of the air you're breathing, you can become overexerted much more quickly than at shallower depths. The solution is simple: Slow down and, if you feel your breathing rate increasing, stop and rest. (Studies have shown that excess carbon dioxide can also contribute to the onset of nitrogen narcosis.)

A special warning is also in order if you're using a computer rather than tables to plan your dive. No-decompression time will be eaten up quickly at depth, and you should avoid the practice of remaining at any depth until you reach the no-decompression limit. The practice of not ascending to a shallower depth until your computer display shows no time remaining is sometimes called "riding the zero," and is a foolhardy practice in decom-

pression safety. (Always allow a safety margin of at least five minutes of no-decompression time remaining when ascending to a shallower level.)

In many situations when diving the forgotten 50, your dive isn't controlled by decompression status, but rather your air supply. This makes gas management as important as decompression planning. Perhaps the most important factor in gas management is deciding on a "turn-around" point — the amount of gas that will dictate when you begin heading home. Remember, because you'll have some distance to travel to get to your safety stop, having reserve air is important. In some cases, divers use the "half-plus-two" rule; you start heading home when your pressure reaches the halfway point plus 200 psi. In some cases this may be needlessly conservative, but in others it may not be enough air. Regardless, under no circumstance should you delay your turn-around beyond 1,000 psi or one-third of your air supply. And this means when the first buddy reaches that point, no matter how much air the other buddy has left. (If you anticipate a great disparity between you and your buddy's air consumption rates, consider using different-capacity tanks to compensate.)

Equally important is that the decision to head home must be clear and unequivocal; the "just one more minute" attitude might work on a shallow dive, but it's asking for trouble in the forgotten 50.

Up, Up and Away

Your ascent is a piece of cake if you've followed your dive plan because it will put you back at the descent line with an ample air supply. My preference has always been to pull myself up the line rather than kick. This allows for a much slower and more precise ascent, plus I don't have to worry about kicking another diver who may be ascending behind me. (Descent lines are often crowded at the end of a dive.) Try not to exceed the rate of about one-half foot (15 cm) per second. In other words, it should take you 20 seconds to ascend only 10 feet (3 m). I'm not sure how to translate that into anything meaningful for you metric folks, except to say, go slow, very slow. In my opinion anyone who is diving to the forgotten 50 should have a dive computer anyway, so pay close attention to its ascent rate monitor.

As you approach the depth range of your safety stop, make sure all the air is out of your BC. This is particularly essential when using an aluminum tank because it will be 3 or 4 pounds positively buoyant when empty. A buoyant diver is much more likely to be carried past the safety stop depth.

As it has become such a common practice, it probably goes without saying that you should always make a safety stop before ascending to the surface after a deep dive. (Many advise it after any dive.) Plan to stop at a depth range of 15-20 feet (4.5-6 m) for three to five minutes. If you have the air and you want to stay longer, fine. It can only help.

In cases where you think you might reach the minimum limit of your air supply — usually, 500 psi — by the time you reach the safety stop, you might consider setting up what are termed "hang tanks" at the stop. These are just spare scuba units that act as a reserve air supply. Especially in open-ocean conditions, it's a good idea to attach a weight to the tanks to keep them stable. Some dive operations that do a lot of deep diving use a a long length of pipe tethered called a "trapeze." The advantage is that a trapeze precludes the need for divers to hover in midwater; and they provide a continual reference point so you needn't worry about depth variations.

Back Home

Most divers assume that their dive is over once they reach the surface It's not. The surface is really your last decompression stop. In reality, your dive isn't over until your residual nitrogen level has returned to near normal, which requires at least six hours It's important, therefore, to avoid any excessive exercise during this final period of "off-gassing," and remain alert for any signs of decompression illness Furthermore, avoid flying for 12-18 hours (24 hours is even better).

To the uninformed, deep diving looks deceptively easy. The truth is, it often isn't much more physically difficult than a shallow excursion. But in planning, self-discipline and dealing with psychological challenges, there's a lot more to diving the forgotten 50 — 80-130 feet — than meets the eye.