National Association of Underwater Instructors

NAUI NEWS

JANUARY 1974

NEWSLETTER OF THE NATIONAL ASSOCIATION OF UNDERWATER INSTRUCTORS

All views expressed in articles which carry a by-line are those of the author and do not necessarily reflect the policies of NAUI

WHAT'S INSIDE?

PROFESSIONAL LIABILITY INSURANCE FOR 1974

by Arthur Ullrich, NAUI General Manager

A new, very improved instructor liability insurance policy for calendar year 1974 has been secured. Some of the features of this new policy are:

Arthur Ullrich

A. WORLD-WIDE coverage with the provision that suit, if any, must be brought in Canada, the United States, its territories or possessions. This WORLD-WIDE coverage will make the policy desirable and useful to members in the Bahamas, British Virgin Islands, as well as other islands of the Caribbean and to military personnel stationed in various areas of the world. For instructors residing and teaching in Canada or the United States, the WORLD-WIDE coverage adds new meaning in terms of covering you, no matter where your students dive after training (see October/November 1973 NAUI News, pages 8-9-10).

B. Limits of Coverage are flexible so that you can now choose $1,000,000 or $500,000 or as little as $300,000 coverage under this new policy. This means that you can choose the level of coverage best for you. There is no aggregate limit and no deductible.

C. Additional Insureds may be added as before for only a charge of $5 each. The additional insured will be covered, as respects your individual teaching situation, with the same limits of coverage you have selected. **Note:** Your assistants may NOT be included as additional insureds (Skin Diving Leaders and NAUI Assistant Instructors may apply for coverage separately). However, the store, school, YMCA, pool, land owners, landlords, clubs or public bodies, etc., may be added to your coverage as additional insureds. You may add as many additic isureds as necessary to suit your needs.

D. The TYPE of COVERAGE is Teachers Liability Insurance which will cover your direct pecuniary loss and expenses arising from claims for alleged error or omission in the performance of or arising out of services in a professional capacity, teaching all aquatic activities, including those in open water.

E. Policy period is January 1, 1974, through December 31, 1974.

F. Primary carrier: Central National Insurance Company, Omaha, Nebraska. Excess carrier: Chicago Insurance Company of Chicago, Illinois.

G. Broker: Albert G. Ruben & Company, Inc., 1450 East 17th Street, Santa Ana, California 92701.

H. Annual Premium: $40 for $1,000,000 — $37 for $500,00 — or as little as $34 for $300,000. For the first time, you may select the level of coverage you desire.

I. How to apply: Complete the form sent to you and return it with your premium check to NAUI Headquarters. Premiums are to be paid by check or money order in Canadian or U.S. currency only.

Premiums may not be pro-rated and therefore, it will cost the same premium regardless of how early or how late you apply for coverage during the policy period.

If you do not receive an insurance application form, send:

1. Full name and NAUI number
2. Complete mailing address
3. Indicate the limits of coverage you desire
4. Attach your premium check
5. Add name and address plus $5 for each additional insured

J. NAUI certified Skin Diving Leaders and NAUI certified Assistant Instructors (to be available in 1974) as well as active NAUI certified Underwater Instructors may be covered under this policy.

One of the most important aspects of your entire instructional package is your personal protection under professional liability insurance. If you teach diving under any circumstance, you need liability protection. It can be the key link in preventing the establishment of a dangerous legal precedence IF you are ever taken to court in a damage suit resulting from a diving instruction related incident. Perhaps the most important aspect of this policy is that it guarantees an adequate legal defense.

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PROFESSIONAL LIABILITY INSURANCE . . . (Cont.)

FINANCIAL RESPONSIBILITY REQUIREMENTS

Active Teaching Instructors are required (as of January 1, 1974) to demonstrate financial responsibility. If your status is Active (Teaching) and you wish to remain in that status, it is required that your demonstrate Financial Responsibility in any one of the following ways:

1. Take out coverage under this policy.
2. Take out coverage under a like policy with policy limits of no less than one hundred thousand dollars.
3. Submit a certificate of coverage naming you as an additional insured under a policy providing like coverage with a policy limit of no less than one hundred thousand dollars.
4. Submit a personal financial statement showing personal assets in excess of one hundred thousand dollars.

It is easy to see that 1 and 2 above are the simplest way to demonstrate financial responsibility (see NAUI News January 1973, pages 6-7).

If there is any doubt as to whether you need liability insurance to cover your teaching status, we suggest you do the following things: Contact your personal insurance broker, contact your attorney and review copies of the *Legal Aspects of Underwater Instruction* (a NAUI technical publication No. 1). We think you will agree that regardless of the circumstance under which you teach, you need liability protection.

The policy indicated above will begin 1 January 1974. If you wait until after 1 January to take out this liability insurance, your protection will begin on the date your application is post marked. We strongly urge and suggest that you act promptly to insure a full year of coverage under this policy.

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A profession is a self selected, self disciplined group of individuals who hold themselves out to the public as possessing a special skill derived from training and education, and who are prepared to exercise that skill primarily in the interest of others.

—Samuel C. Florman

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BRANCH MANAGERS MEET TO DISCUSS NAUI'S FUTURE

What do we want the future of the National Association of Underwater Instructors to be? How are we going to get there?

For the first time in NAUI history, all ten managers from the United States and the Provinces of Canada met to thrash out the accumulated questions and ideas of each geographical area. The meeting was held December 7 through December 9 at the Hilton Inn located less than two miles from NAUI Headquarters.

Branch Managers: (Left to Right Standing) Fred Calhoun; Steve Kozak; Bob Widmann; Art Ullrich, General Manager; John Larsen; Leon Manry; John Frederick; Bill High; Mark Flaban (Sitting); Merritt Bartlett (Center, Kneeling); and Lee Kvalnes (Right, Kneeling).

It was a marathon, shirtsleeves meeting because so much had to be done, including face-to-face discussions with three officers of the Board of Directors and the entire Headquarters Staff. For the first time, all the Branch Managers had the chance to meet the clerical staff of Headquarters, who provide certification support materials.

After a tour of Headquarters, each member of the Headquarters Staff backgrounded organizational operation.

The rest of the weekend was spent discussing issues the Branch Managers had suggested before the meeting began.

A look at the Branch Managers and their backgrounds is scheduled for the next NAUI News.

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WE DO NOT TEACH DIVING SO MUCH AS WE TEACH PEOPLE TO DIVE

NINETY SECONDS DEEP SCUBA RESCUE*

by G. D. Harpur, M.D.

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Editor's Note: This paper, presented at IQ_5 in Toronto, did a great deal to stimulate new thinking about diver rescue. Many requests have been made for reprints, so the paper is presented here in its entirety. Those wishing to contact Dr. Harpur should direct their comments to: North Muskoka Medical Clinic, Box 1530, Huntsville, Ontario, Canada. Comments are also invited for discussion through future issues of NAUI News.

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It is proposed in this study to review the problems posed by the unconscious diver and to present solutions available to the diver attempting rescue.

G. D. Harpur, M.D.

The unconscious diver has ceased to breathe. There may be several reasons — depletion of supply, contaminated supply, equipment malfunction, the little-appreciated danger of cold, or other medical problems. He will have lost his regulator, and his oxygen stores rapidly deplete. Unless he, or a rescuer is able to replenish these, he will die.

Illustration No. 1 shows a comparison of oxygen consumption with elapsed time in a non-breathing subject whose heart is still beating. Depending on the reason for his loss of consciousness he is left with a certain amount of time until he will have sustained irreversible damage to his brain and only a little longer before he will die. At the point in time when his arterial pO_2 drops below the level of 40 mm. Hg, (normal level = 80-90), his consciousness will be very much impaired. The time remaining after this until his pO_2 arterial drops to levels which will result in a permanent alteration in the diver's central nervous system is approximately 90 seconds. This does not mean that anyone found on the bottom known to have been down in excess of this time should be abandoned or handled differently, but attempts to point out that we should aim at developing a rescue technique which will take less than 90 seconds.

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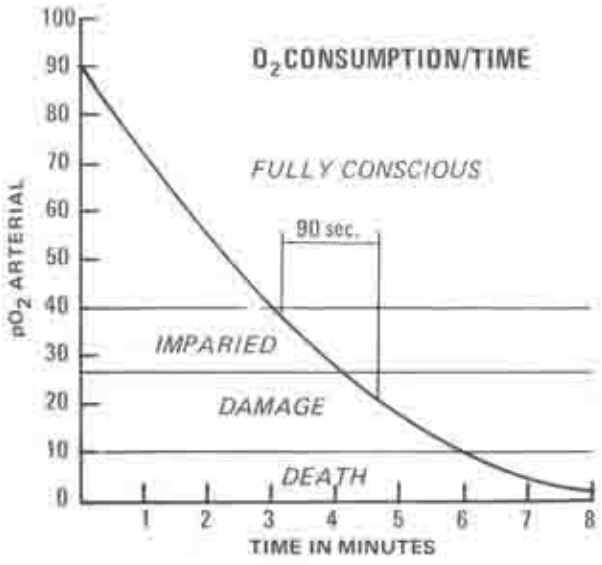

ILLUSTRATION NO. 1

What is needed to treat an unconscious diver, assuming intact circulation, is a source of oxygen and ventilation to remove CO_2. Is this possible deeply underwater? It may be. A standard two stage regulator with purge button cannot be utilized as a ventilator on the surface as the exhaust ports free flow, any attempt to obstruct them can lead to application of full intermediate pressure to the lungs or instant embolus. In water it is possible to ventilate with a regulator because of the substantial pressure gradient which exists for very small differences of depth. (e.g. .44 lbs. per sq. inch per foot or in centimeters of water 1 cm. of water pressure per 1 cm. depth.) By inverting the victim it is possible to have a pressure on the exhalation ports of the regulator 30 mm. In excess of the pressure on the lower chest wall (in this case since the diver is inverted it would be his upper chest wall). The regulator must be inserted with the victim upright and purged before inverting the unconscious diver for as the victim is turned to the inverted position the reversal of the pressure gradient to which the chest is exposed will result in an effective inspiration. The victim would inhale water, then, if the regulator is not in place. (See Illustration No. 2.) In most situations this technique is of no particular value and because it is difficult to perform alone, valuable time may be wasted. If the diver begins to recover underwater serious problems are bound to ensue with panic no matter how experienced the person is. The technique may be useful, however, in situations such as

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NINETY SECONDS DEEP . . . (Cont.)

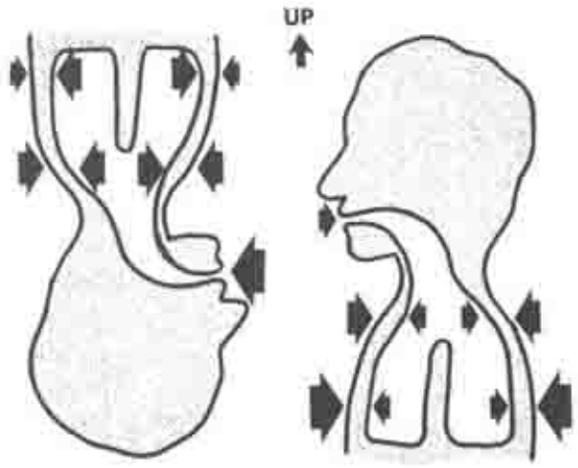

ILLUSTRATION NO. 2

saturation diving, cave diving, or wreck diving where either a habitat is close to hand or escape to the surface would result in severe decompression illness. If the surface is not accessible this technique might be useful.

It is worth emphasizing at this point that the unconscious diver's air supply must be suspect. If his tank is not empty, why is he in difficulty? Regulator malfunction or contaminated air supply may be impossible to rule out. If the safety of his supply is uncertain then the rescuer's supply would be the only source available and the procedure becomes increasingly unwieldy unless an octopus regulator is being used. Mouth-to-nose resuscitation can be and has been carried out successfully by my associates and me but requires an extremely relaxed operator with previous practice. The hazard of recovery and ensuing panic is ever present. The exact technique for performing both mouth-to-nose and the previously mentioned artificial ventilation with regulators of all types will be described in detail in a separate paper to follow. There remains but one obvious source of air for an unconscious sport's diver — the surface air.

Hazards exist on the surface too. Boyle's Law has to be considered. Boyle's Law will have its greatest effect between 30 feet and the surface when the air in the lungs will expand to twice its original volume. If a person leaves 30 feet with 4.0 litres of air in his lungs he will have 8.0 litres of air in his lungs on reaching the surface if none escapes. If he has only 6.0 litres of a total lung volume he will have ruptured his lungs and probably have sustained an air embolus.

In an unconscious diver the following can obstruct the air passage:

1. Flexion of the neck. While true for inspiration or driving air into the lungs, it is not valid for exhalation because the pressure of air from below can passively open the passage. This is similar to a cork in a bottle which can be pushed out from below and rapidly becomes loose yet wedges tightly if pushed down. (See illustration No. 3.) A simple experiment can prove this — draw in the biggest possible breath and have someone push the chin down on the chest as hard as possible, by relaxing, the air comes out. This has been repeatedly verified on anaesthetized subjects. Air cannot be forced into the lungs with the neck flexed but it can flow out.

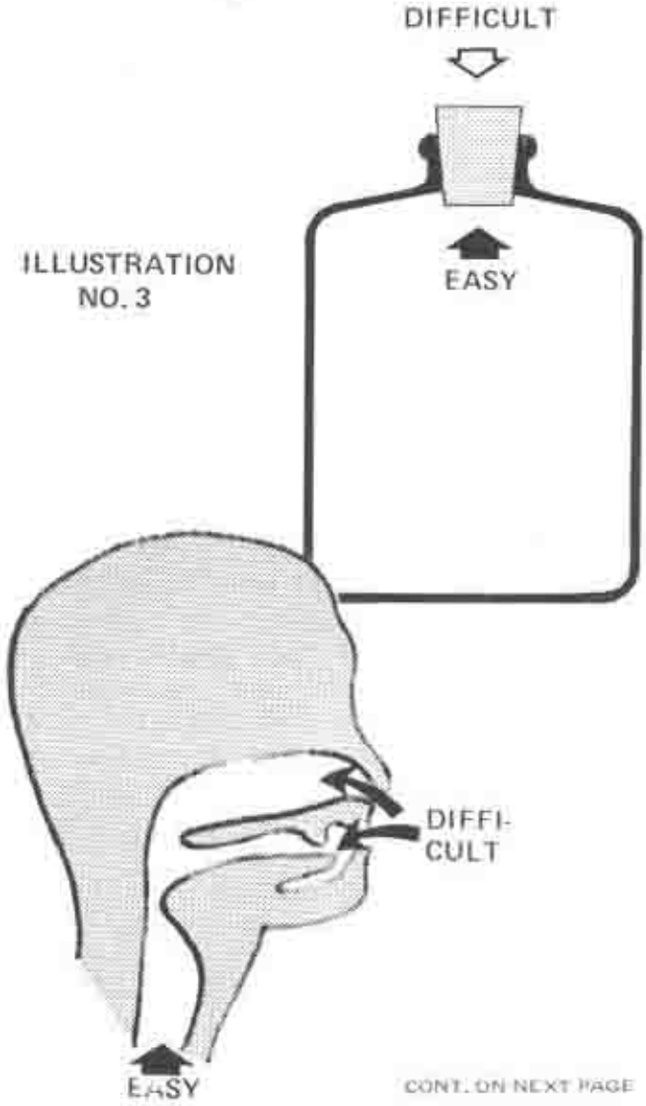

ILLUSTRATION NO. 3

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NINETY SECONDS DEEP . . . (Cont.)

2. What about flow rate obstruction? Can expansion of the gas take place so rapidly that the respiratory tree is unable to handle the flow involved? Divers can achieve flow rates in excess of 400 litres per minute without encountering difficulty. To achieve these kinds of flow rates while surfacing a man with a 7 litre chest would have to ascend 30 feet to the surface in less than 1/60 of a minute or under 1 second, unlikely at any buoyancy. The fact that this can be safely accomplished is further substantiated by experience in the high altitude chambers where the rate of change for the same pressure differential is extremely rapid during a procedure known as explosive decompression. During this particular procedure the person does the equivalent of ascending 15 feet to the surface in less than 1/100 of a second.

3. Laryngospasm could be present especially if water has impinged on the vocal cords. Again the larynx is like a bat wing door, it opens in one direction even when in spasm. This, too, has been confirmed in anaesthetized subjects during operations. Embolus in the unconscious victim is probably near impossible but in a panic-stricken, conscious victim all sorts of voluntary mechanisms exist, whereby he can prevent air leaving his chest. A look at data from high altitude chamber work where as many as 3-400 people a year undergo explosive decompression verifies this. In a normal decompression run a change in ambient pressure from 14.4 lbs. per sq. inch to 8.6 lbs. per sq. inch takes place in less than 1/100 of a second which is the equivalent of an instant trip from 15 feet to the surface without ill-effects and without embolus occurring in any of the subjects. This indicates that the person in air who is not frightened about drowning and therefore not desperately hanging on to his air permits the air to escape and that it can do so passively and safely at very high rates. On the other hand there are many examples in diving where air embolus has been sustained with changes of as little as 8 feet to the surface, but in these instances it was in a subject who is in a foreign environment, panicky, and attempting to hold his air by voluntary mechanisms. In any instance where a diver is brought from the water and found to have an air embolus, it is my contention that the air embolus was sustained before unconsciousness ensued, not after. Even if laryngospasm is present at the outset, spasm will relax as the pO_2 decreases.

The effects of Boyle's Law as the diver surfaces results not only in the expansion of the gases in the chest but also in a fall in the respective partial pressures of the gases present including O_2 in both the victim's lungs and in the victim's blood. (See illustration No. 4) (A). If the victim leaves the bottom at 30 feet with a pO_2 arterial of 40 mm. by the time he reaches the 15 foot level the pO_2 arterial is down to 30 mm. on the basis of pressure change alone with no allowance for his consumption. By 2-3 feet he has a pO_2 arterial of below 25 mm., a pO_2 level capable of producing permanent damage. If he started at a depth of 90 feet his pO_2 at 30 feet will be maximum of 20 and by 15 ft. a maximum of 15 mm. of mercury at which point his blood may be giving off oxygen into his lungs. This state results in an almost instant depletion of blood and tissue stores. The blood literally takes O_2 from the tissues, brings it back to the lungs causing anoxic changes or death. (See illustration No. 4) (B). To save the diver he must get through this zone as rapidly as possible. One foot per second or even 2 feet per second are obviously far too slow. At one foot per second it will take 90 seconds to get from the bottom alone. It becomes apparent that not only is the best source of air the surface, but that ascent should be as rapid as possible even if the rescuer cannot safely keep pace.

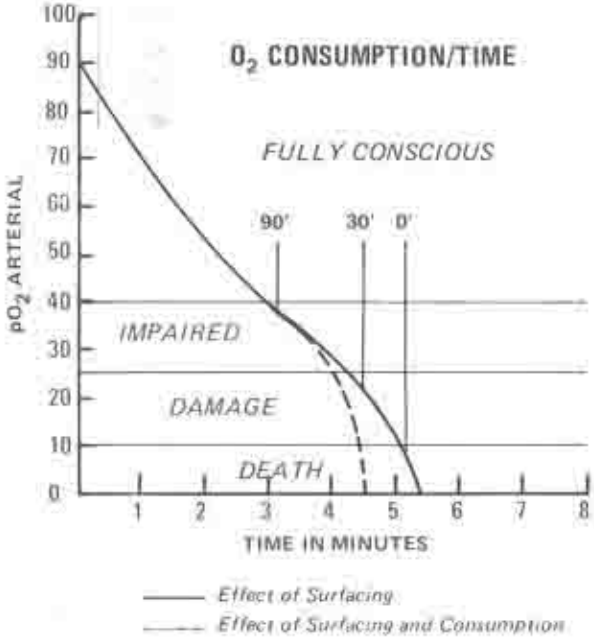

ILLUSTRATION NO. 4A

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NINETY SECONDS DEEP . . . (Cont.)

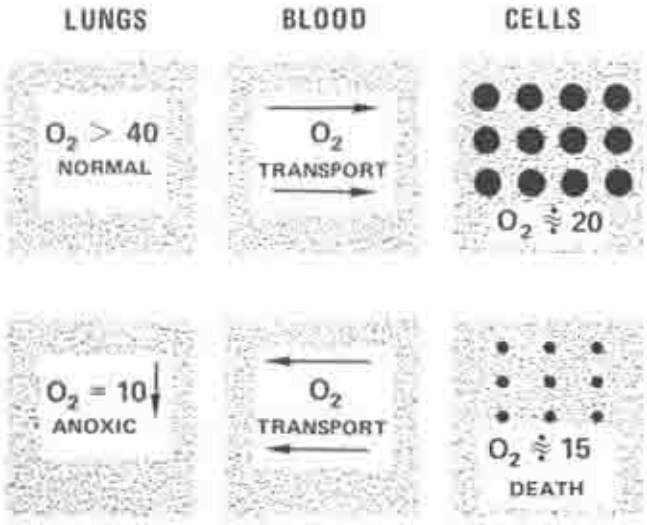

ILLUSTRATION NO. 4B

The suggested technique for saving an unconscious diver is as follows: A diver is found lying on the bottom, (e/g. 60 feet) unconscious, regulator out. The weight belt and mask are removed, the diver is raised to a vertical position, his vest is pulled and he is allowed to ascend, the rescuer following, to institute artificial respiration on the surface. What is happening physiologically when the diver is rotated into the vertical plane? The gradient of pressure on the chest wall from the water will cause the lung volume to decrease and any excess air will come out of the mouth. This will purge the airway from below without the danger of driving water into the larynx and precipitating laryngospasm. As the unconscious diver begins to rise the expansion of air within the chest will continue until the pressure required to further expand the chest wall and offset the 30 cm. of water gradient between the base of the lung and the mouth exceeds the pressure required to open the airway from below and allows the excess to stream out of his nose and mouth. When he arrives at the surface provided he is wearing a standard vest (which will float him on his back), he will first shoot from the water into the air then fall back into a horizontal float supported by his vest. The sudden removal of the 30 cm. of water gradient due to his vertical position and immersion in the water will result in a passive inspiration of 6-900 cc. of air without any assistance. This was verified by the following experiments.

First, relaxed subjects connected to spirometer recording air into and out of the chest were lowered horizontally into a swimming pool and the volume of air leaving their chests passively was measured. They were then permitted to hang vertically and again the air leaving the chest with this change in attitude was measured. Finally they were raised out of the water to a horizontal position and the air entering the chest measured and the following figures were obtained. (See illustration No. 4) The degree of relaxation of the subject must be suspect and so to be certain subject was anaesthetized, a tube put in his throat and he was put back into the pool repeating it all again which was done with the results labelled 1A (Illustration No. 5).

CHANGES IN LUNG VOLUME
WITH POSITION IN THE WATER

Subject No. 1	1A	Subject No. 2
200cc	100cc	170cc
750cc	700cc	600cc
900cc	800cc	700cc

ILLUSTRATION NO. 5

The next illustration, No. 6 gives a comparison of the time required for each phase of the various methods of rescue and a comparison of some of the hazards. From the totals the advantages of what has been advocated in this discussion seem clear, in addition it has been pointed out by references to the high altitude and anaesthetic experiences the hazards of embolus for the unconscious victim are vastly over-rated com-

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NINETY SECONDS DEEP . . . (Cont.)

pared to such hazards as fulminating anoxia, an inevitable consequence of ascent whose effects can be minimumized only by the most rapid ascent possible. In addition the victim receives that crucial first breath upon arriving at the surface as a bonus without any assitance from the rescuer.

In this brief report I have reviewed deep scuba rescue and have developed a simple, effective method for accomplishing deep scuba resue in less than 90 seconds.

COMPARATIVE TIME COST

	NEW WAY	BRAND "X"
Remove Weights	1.5 sec	1.5 sec
Replace Reg. and Purge	N/A	5.0 sec + (20 sec)
Extend Head Squeeze Chest	N/A	2 sec May induce vomiting
Pull Vest	0.5-1.0 sec	N/A
Invert Victim	N/A	2-5 sec Aspiration
Trip Up (30')	4-6 sec or less	15-20 sec
Approx. Time to (1) First Breath	6-8 sec	25-33 sec
(2) Start A.R.	10-20 sec	25-33 sec

ILLUSTRATION No. 6

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"BEEF-UP" YOUR TEACHING PRESENTATION

by William M. Busch NAUI 2981

I sincerely believe that teaching ability is something you either have or do not have. I also realize there are varying degrees between the two extremes. Formal education can help one improve, but I still believe in my opening statement. In this article, I will endeavor to point out various ways in which one might improve his teaching techniques. As you read through this article, strive to make a mental analysis of your present teaching methods.

William M. Busch

NAUI instructors, as well as flying, firearm, driver's education instructors, must be extremely safety conscious and impart this same attitude to diving students. One's success will be measured in terms of the positive change he affects on his students. To teach them to fire a gun without building positive attitudes toward safety is like giving the neophyte an airplane without any instruction.

There are several laws of the learning process that, if followed, will result in good or improved instruction. Let's look at several.

The Law of Effect

The student must experience success in order to maintain an optimal learning experience. One will tend to repeat activities that tend to satisfy and tend not to repeat activities that fail to satisfy.

The Law of Readiness

The student must possess the mental maturity and desire in order to be ready to learn. He must possess enough neuromuscular strength to sustain his effort while participating. The instructor should endeavor to maintain the state of readiness at an early point in the learning process.

The Law of Frequency

It is unlikely that the individual will be able to master all of his skills on the first exposure. The student will need to repeat some skills many times

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"BEEF-UP" . . . (Cont.)

in order to develop the desired patterns of movement.

The NAUI instructor must be prepared in such areas as class organization and materials. He should try to begin making lesson preparations the very day in which he finishes his last lesson. There is a motto: "A pot of beans is never at its best the first day it's on the stove." I make an attempt to start preparing the very day, or even before, I have finished the previous lecture. Make reading assignments meaningful, to familiarize the student with the material which will be covered in the next class lecture.

Be organized, and position the students so that all can see and hear the demonstration at hand. Arrange the class so that all will have maximum space in which to practice the skill or skills to be learned.

The scuba instructor must communicate confidence to his students in his presentations. One does not develop this by boasting of his past experiences. Rather, he imparts this confidence to his students through knowledge of subject matter. Knowledge is the framework from which we build this confidence. Knowledge and teaching abilities are directly related to one's success. One should always attempt to teach from the known to the related unknown; it will make understanding much simpler. One should try to develop a mental photographic image to check incorrect patterns of movement as they occur. This will definitely help one as he endeavors to correct mistakes during the practical application of fluid motion. If one possesses this ability, the outcome will pay high dividends to his students while improving or learning that skill.

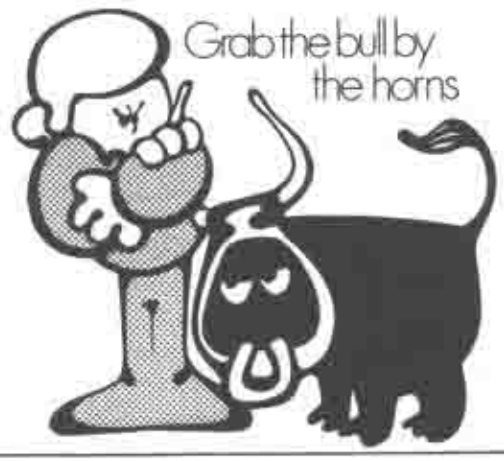
One must have the ability to demonstrate, or better yet, have someone to demonstrate, while the instuctor verbally describes the particular skill that is unfolding in front of the student. We have all heard the cliche': "A picture is worth a thousand words."

Each minute one is in front of his students he should be cognizant of that virtue which varies so greatly from one human being to another; this quality is patience. Try to apply the mental brakes before "blowing-up". I have been present when teachers have used their position of authority to degrade or ridicule other individuals. At this point they lost up to 50% of their class, and the instructor certainly is not damaging anyone's character but his own. We as instructors often think this class is the only problem confronting our students. But one must be cognizant of the fact that a student's mind is occupied with many things, not just this class. Patience and enthusiasm go hand in hand while working with borderline cases. This is when one must muster up his wits and patience through words of encouragement and enthusiasm to keep the student striving for the objectives at hand.

I sincerely hope you will not be confronted with a student who feels forced into taking your course because of peer pressures. The majority of the students will be there because of a genuine desire to learn. This will enhance the quality of instruction the instructor can produce. Attention will run high because of the opportunities of practical application. Students will remember 10% of what they hear, 50% of what they see, and 75% of what we say. Ninety percent of the learning process, is through practical application.

When one considers the senses, learning is 75% through sight, 35% through hearing, 3% through taste, 3% through smell, and 6% through touch. If at all possible, expose each of these senses during the learning experience as they develop their skills. Our students will learn through the emotional process. They will first learn to like the instructor, then they will learn to think highly of the teacher's subject. Remember, one should prepare well to teach well: "start yesterday"!

I sincerely hope that this short paper will bring to the instructor's consciousness some area that may have been dormant. My closing statement is: If one does not thoroughly enjoy teaching, get out for both the instructor's sake and the student's sake. There are much easier ways to make a living!



DIVING IN THE PACIFIC BRANCH — ARIZONA STYLE

by Mark A. Cagle (NAUI 3476)

In the August/September issue of NAUI News, on pages 12-14, there was an article dealing with the diving in the various branches of NAUI. In this article the editor called upon the various members to offer a synopsis of the diving in their respective areas. I would like to go one step farther and ask that each state in the U.S. and each country in NAUI submit its own description of its diving areas. It may even be possible for NAUI to take all these descriptions and compile a world-wide diving brief for the benefit of all divers.

Arizona has the unfortunate reputation of being nothing but blistering deserts and shifting sand dunes. NOT TRUE!! We do have both of these, but we also have a very active diving program. In fact, when I attended my ICC there were five candidates from Arizona out of a total of fifty-three. That is almost 10%, and the ICC was held in Monterey, California, about 800 miles from Phoenix, Arizona. This points out the interest that is generated in our state. We do not have any ocean frontage, but we do have a lot of water to dive in. In the following article I will use the same format as Mr. C. L. Smith (NAUI 2299) to provide a standard for compiling data.

Purview

Arizona is just beginning to exhibit the fantastic growth that has been a trade mark of California for the past decade. Ten years ago the diving situation was one that is best classified as nonexistant. There were few dive shops and these were many miles apart. The individuals that did dive were what we would call the front-runners of the sport. They went into waters that were unknown and came back with the experiences that led to the state of the art today. Now some of you might question the phrase "state of the art today" but let me tell you that there are some characteristics of Arizona diving that would freak out some of the divers on the West Coast.

The diver here is still regarded as a fish-out-of-water type person. Certifications that are most common are NAUI and PADI, with NASDS starting to show some serious competition. The other certifications are scarce and rarely seen. Basic training usually includes one lake dive and one open water ocean dive. The ocean dive may either be from a boat in California or it may be a beach dive in Mexico. Guaymas is a strong candidate as the most actively used spot. Advanced training is difficult to get because qualified instructors are hard to come by. The Phoenix area offers the best choice for advanced training, with Tucson right behind it. Training at colleges and universities is unpredictable and often omitted. Arizona State University is perhaps the most stable with certifications offered for NAUI, PADI, NASDS, and YMCA.

Arizona waters are characterized by man made lakes, with the upper water temperatures in the 80's and the lower water temperatures falling into the 40's below the thermocline at the bottom. Diving is seldom over 100 feet, even in the deepest lakes. The one exception to this is the Sheriff's Diving Possee which dives to all depths. There is no surf and the current is usually mild to nonexistent. Swimming distance is held to a minimum and wet suits are used only for deep dives into cold water. BC vests are the coming thing with all shops recommending them.

Hydro testing is scarce and as of this writing there are no chambers in Arizona. There is a new shop to be opened in the Phoenix area that will have one in the near future. It will save a long ride to Los Angeles or San Diego for some diver. I hope to see more in the future.

The most common diving activity is exploration with checkouts and carp spearing second and third. Fresh water is the rule and altitude dives are unknown. Anyone who even mentions ice diving is looked at with the "you-gotta-be-kidding" stare. We are not used to deep diving and the emphasis is placed on warm shallow water diving.

As in Mr. Smith's article, it is hoped that the following will acquaint the prospective visitor with the general conditions and practice of diving in Arizona. I hope that this insight will encourage some of the California divers to try Arizona with the knowledge of what may be expected of them.

Conditions

With Arizona being landlocked, all the typical ocean conditions are absent. What we do have is a great variety of lake and river conditions that can change remarkably fast.

Rivers:

With limited experience in the rivers of Arizona I have found that moderation is the keyword. Temperatures are usually in the 60's and visibility is usually from one foot to a maximum of ten feet. Current is about one knot, anything faster I would question diving in. I have found that night diving in rivers offers some great adventure with the best visibility. The Salt River has some good spots for this.

The bottom is usually sandy, with gravel and rocks being abundant. Some rivers have a great mass of eel grass growing on the bottom that can pose some problems, as it is more apt to cling to a diver than kelp. It does respond to the same techniques as used on the coast, that is, slow gentle drawing and shaking movements of the limbs trying to go with the current.

Aquatic life is restricted to trout, which the diver rarely sees, and bottom fish such as carp, catfish, and bass. Eels are rare and this diver has never seen one.

Lakes:

This is the main environment of our diving, with the lakes of the Salt River being the most popular. As opposed to the rivers, the lakes are best classified as being waters of

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DIVING . . . ARIZONA STYLE (Cont.)

extremes. Temperatures can run from 100°F to 30°F. Thermoclines are common, with the diffrence often being extreme. An average difference is about 20°F. Tied to the temperature is the visibility. The general rule is: the colder the water the clearer it is. At certain times of the year we have what is called lake "turnover." This is when all the water in the lake takes on one temperature and visibility. The bottom goes up and the top goes down creating very poor visibility. The Spring turnover is the major one of the year, with all diving coming to a stop.

The Salt River Lakes are drained and cleaned about every five years, therefore, the bottom is free of major snags and debris. One exception to this is the fish nests made of hundreds of old tires tied together with cable and anchored to the bottom. The bottom is composed of gravel and rocks of the larger dimensions. Steep cliffs and underwater valleys are very common.

Aquatic life is composed of bass, catfish, carp, bluegill, and some trout. The lakes are almost devoid of grasses and plant life is about nil.

Regional Hazards and Precautions

Local hazards are few but they can be very dangerous to persons unaccustom to them. As always check with a local dive shop or an experienced native before diving. It could mean the difference between a narrow escape and a very enjoyable dive.

Aquatic life hazards are nil, but there have been some local stories going around that some catfish in Roosevelt Lake have reached fantastic size and have given some divers cause to retreat rather than become a meal. My opinion is if someone could get a picture of such a fish he would be quite a local hero. It would also make quite a story for NAUI News.

The real hazards are cold, depth, and entrapment. As all divers know, cold water can numb you until the regulator becomes difficult to hold in your mouth and it is impossible to inflate a BC vest. This can happen very soon to a diver who is sitting on the bottom waiting for fish to swim by. If you have to sit for your fish, do it above the thermocline or wear a good wetsuit.

If you do go deep wear a depth gauge, as it is impossible to judge depth accurately when you lose sight of the surface. It is very easy to drop to over 100 feet and not know it. There are cliffs that are higher than that all around and under the lakes. When diving on a cliff stay on the same plane as your buddy or you might find large rocks and boulders raining down on you.

In poor visibility use buddy lines. Once while descending with my buddy I lost sight of him at about thirty-five feet. That is about ten feet off the bottom at that point and I figured that I would meet him on the bottom. After descending for about another minute and upon looking at my depth gauge I found I was at 80 feet! What happened? I had dropped straight down an old mine shaft, while my buddy landed on the edge. We both returned to the surface, regrouped, and had a great time exploring the mouth of the old mine and the surrounding area. How deep that mine is I have no idea. There is a mine near Apache Junction where miners struck an underground river at 1000 feet and it is flooded. Divers have gone down into it and have come out with tales of strong currents and endless tunnels. Beware of old mine shafts on the bottom.

This final hazard is common to lakes that are man-made and have been flooded. It is the old barbwire fences. Many an Arizona diver has been swimming along to be suddenly faced with a fence that has curls of wire all over the area. If you become entangled in the wire your knife will do you no good. The natives all carry a pair of wire cutters as standard equipment. So should you.

Typical Gear and Rigging

Wetsuit with booties, hood, and gloves; Fins with adjustable heel straps not taped; Weight belt that is adjustable; BC vest with CO_2 cartridge; Snorkle and strap attached to mask; Single 72 tank with J valve; Single hose regulator without neck strap; Light with nonrechargeable batteries; Compass worn on the wrist; Knife worn on the inside of the right calf; Wire cutters worn on the weight belt.

Most divers suit up on dry land and don the mask, fins, and snorkle in the water. They usually remove all gear except the wetsuit before leaving the water, placing it on the shore. Snorkles are usually used only for swimming back to shore after the dive. Buddy lines are sometimes seen but descent lines are rare. The deeper divers usually have all the proper gear, including a DC meter. Special precautions such as extra tanks, octopus rigs, and marked ascent lines are rare.

Equipment is valued and weight belt dropping is uncommon. The diver down flag is used by most divers and is usually of the self-floating type. Knowledge and inforcement of the clear zone is variable with most boaters curious as to what you are doing. Spears are of the shorter variety and are almost all band powered. Generally they are not used.

Getting to the water is as simple as a drive to the lake. Getting to your favorite diving spot may or may not involve a boat. Charter boats are nonexistent. An average rental for a small boat and engine is $20 a day, or $4 an hour. These boats can not be rented through the dive shops, but are generally rented by the boating firms. Sahuaro Lake has boat rental available at the above rates.

Scenario of a Typical Dive

At 8 o'clock Saturday morning the wife wakes up the diver by telling him breakfast is ready and to get with it or we will be late. Plans were made last night to meet at

CONT. ON NEXT PAGE

DIVING . . . ARIZONA STYLE (Cont.)

Apache Lake, with the diving to be off Burnt Carrol Campgrounds. We stow the gear in the back of the pickup and head up the Apache Trail. After about 40 miles of paved and dirt roads, up and over famous Fish Creek Hill, we arrive at about 10 o'clock. We are a bit early and decide to set up camp. The hibachi is started and coffee is put on. The ice chests are unloaded and the gear carried to the shore line. By 10:30 everyone is present and ready to go.

Buddy pairs are chosen and one buddy walks out to waist-deep water after doning his wetsuit. The other buddy brings him all his gear plus his own. They help each other put on their gear and wait for the leader to go out and position the divers flag. When he is satisfied everything is OK he motions for the rest of the group to join him. They swim out with vests inflated, in buddy pairs in a single line. When all are ready, the whole group goes down at once. The water is clear over a gravel bottom at 10 feet and everyone heads in a different direction. My buddy and I head for deeper water. About 10 feet from where the flag is anchored there is a 30 foot cliff, dropping to a level plain at 40 feet, with a mild current of about 1/4 knot going down stream. We head upstream along the cliff. There are some large bass in some holes in the cliff and we wish we could spear them, but game fish are illegal to spear in Arizona.

After about 45 minutes of swimming along the cliff I am down to 500 psi and indicate with the thumbs-up signal to my buddy that it is time to ascend. We swim slowly up the face of the cliff amazed at how light it is getting. The sun is directly overhead and it seems that we are in water of at least 100 feet visibility. Finally, when it seem that we have left the water and are ascending through clear air we reach the surface. Having swam against the current we find ourselves about 300 yards up the lake and only 30 feet from shore. We decide to swim back. My buddy snorkles, but I like to roll over on my back, inflate my vest, and watch the others coming to the surface all along the line of the underwater cliff. A couple of boats go by with a Sheriff's Patrol Boat asking us if everything is OK. We yell "Fine!" and he goes on his way.

Back on the beach friends have hamburgers and hotdogs on the fire. We reach the shore and swim in as far as possible. My buddy finds a flat rock with a deep spot next to it and he takes off his gear and calls for me to come on. The water is at the top of the rock and he leaves his gear there while he goes to get his gear bag. We rinse our gear in the lake to get out the sand and gravel, stow it in our gear bags, then slip out of the wetsuits. We hang the suits on the tailgate of the pickup knowing that they will be dry in about 1/2 an hour.

The hot Arizona sun is directly overhead as the wife brings me a much yearned for Coors. We spend the rest of the day soaking up the sun, eating a huge lunch of hamburgers, hotdogs, frenchfries, beer and pop. With all afternoon to snooze under a palo verde with an occasional dip in the lake to cool off, who could ask for more?

Editor's Note: C. L. Smith offered the challenge and put it into action with his article on how it is in Southern California. Now Mark Cagle has done a fine job putting it on the line for diving in Arizona. If **you** *were to never write any other article, but one on how diving is done where you are, you would have made a most positive contribution to diving.*

-NN-

SEATTLE UNDERWATER PROGRAM TO BE HELD IN MARCH

For the sixth year in a row, the largest underwater program in the Pacific Northwest will be held at the Pacific Science Center in Seattle, Washington. MAN'S EXTENSION INTO THE SEA will be held March 23 - 24, and will draw leaders from throughout the world in both film and scientific exploration.

This year the symposium promises to outdo itself – AN UNUSUAL feat, for the last three programs have been sold out in advance. New films will show in color what is happening now, while the people who spent part of their lives underwater will tell what it's like.

Feature films will be shown on shipwrecks, ecology, underwater parks, and travel for diving fun. Each year these films improve as underwater filming and techniques improve.

The International Photo Competition will be a major part of the Symposium, and it is open to ALL – amature and professional. A new feature this year is that entries will be placed in categories according to the latitude in which the pictures were taken. No longer does the picture taken in dirty Northern waters take a back seat.

Share experiences with underwater explorers from around North America.

Order Tickets Early (after February 1, 1974) – Last Three Programs Sold Out In Advance

Complete Two Day Program $6.00 – One Day $4.00

Contact: NAUI, 6531 N.E. 198th St., Seattle, Wash. 98155, Phone (206) 486-2252.

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National Association of Underwater Instructors

HEADQUARTERS
22809 Barton Road
Grand Terrace (Colton) Ca. 92324
Telephone (714) 783-1882

BIO-MARINE EXPLORATION SEMINAR

EXPLORE THE REVILLAGIGEDO ISLANDS

DATE: April 6-13, 1974 (Easter Week)

TOTAL COST: $440 - $310 ship cost ($50 per day for 6 full days)
$130 transportation - (air fare and buses)

The Revillagigedo Islands (Mexico) are located about 300 miles southwest of Cabo San Lucas, approximately 19°N latitude. (The big island of Hawaii is 20°N latitude.) Isla San Benedicto is a new volcano island, 1952, while Isla Socorro is the largest of the island chain. The marine life of these islands is virtually unexplored. The objective of the trip is to explore, for the first time, the coral reefs of these islands in cooperation with Mexican scientists.

NUMBER OF PARTICIPANTS: 30

VESSEL: FINALISTA 100 (formerly the "Salty Dog"). This luxury vessel is 100 feet, fully air conditioned, 3 screws powered by 3 Caterpiller diesel engines, cruises at 13 knots, fuel capacity of 3,300 gallons, range of 850 miles. Dual compressor scuba system, equipped with tanks, harnesses and weight belts. There are separate washrooms and hot showers for men and women, 15 carpeted staterooms each with wash basin.

ROOM AND BOARD: Provided are food, blankets and sheets, scuba air, tanks, weight belts, and fishing license. Each participant who intends to collect specimens will have to secure his own scientific collecting license beforehand from the Mexican Government. Beer and soft drinks are extra.

PERSONAL GEAR: Bring your own personal effects, towels, soap, etc. Warm clothing is advisable, but bring thongs and bermuda shorts for day wear. Space is limited, compact all items in duffle bags.

DIVING EQUIPMENT: Bring all your diving gear except for cylinder and weight belt which are provided on the vessel. A night light is needed for evenings. Water temperature will average about 64° so a wet suit is necessary. Underwater camera is a must for recording these unexplored reefs. Scientific collectors must provide their own equipment and preservatives. All gear must be compacted into duffle bags.

TENTATIVE SCHEDULE:

April 6 (Saturday) - Board bus at San Diego Airport at 11:30 AM for Tijuana. Depart from Tijuana, Mexico at 1:35 PM on DC-9 jet. Arrive in La Paz at 4:15 PM. FINALISTA 100 departs at 6:00 PM to arrive at Isla San Benedicto about 12:00 Midnight on Sunday, April 8.

April 8-12 (Monday - Friday) - Dive the coral reefs of Isla San Benedicto and Socorro. Also make studies of geology, fauna and flora of land forms. Arrive in Cabo San Lucas, Cerralvo Isla on Friday, April 12.

Over

April 13 (Saturday) - Dive at Cerralvo Island in the early morning; catch Aero-Mexico flight at 11:15 AM to Tijuana. Arrive by bus at San Diego Airport about 1:00 PM. The next day is Easter Sunday!

STAFF SCIENTISTS: Gordon L. Chan, Ph.D., NAUI 1848, Expedition Leader, Marine Biologist. Others to be announced.

TEXTS: The only texts of some use which are commercially available are:

Brusca, R.C., Common Intertidal Invertebrates of the Gulf of California, The University of Arizona Press, Tucson, Arizona - $10.50

Keen, A.M., Sea Shells of Tropical West America, 2nd Edition, Stanford University Press, Stanford, California, 1971 - $29.50

COLLEGE CREDIT: Course credit of 2 units will be available from the Dominican College of San Rafael, California. Tuition fee is $50. Enrollment forms will be passed out on the vessel.

TO APPLY: NAUI will send application and medical forms to you upon request.

1. Complete and sign the NAUI application form.
2. Complete NAUI medical form with physician's signature.
3. Make out a check of $220 (deposit of half-cost) or $440 full payment, payable to H & M Landing, before February 12, 1974.

MAIL ABOVE MATERIALS TO: H & M Landing
NAUI Bio-Marine Exploration Seminar
Scott & Emerson Streets
San Diego, California 92106

The total fee of $430 must be paid on or before February 15, 1974. There are 30 available slots, first choice will go to NAUI Instructors and NDA members who are certified divers. Dr. Gordon Chan will inform you of acceptance as soon as your application is reviewed. Early enrollment is the key towards being selected; do not tarry on submitting your forms. H & M Landing retains the option to cancel the trip and refund deposits by February 15.

For further information, watch NAUI News and NDA's DIVING WORLD for articles about this unique trip. For additional data, contact Dr. Gordon Chan, College of Marin, Kentfield, California 94904 - phone (415) 454-3962 - Ext. 381.

WHAT IS THE ROLE OF THE ASSISTANT INSTRUCTOR?

by Dennis Graver, Editor

The new 4:1 student to instructor ratio presented to members in the Oct./Nov. '73 NAUI NEWS caused quite a stir. Phone calls, letters, questions in the field and discussions during meetings point out that clarification on the use of assistants is required.

Dennis Graver

The biggest complaint is that by reducing the ratio for 10:1 some believe the assistant will assume more responsibility and actually function as an instructor without being qualified to do so. It is visualized the Instructor could stand on the shore and direct his assistants to train his students in and under the water. No way.

When an Instructor signs the Student Registration Form to certify students, this certifies the student's proficiency level to NAUI standards. This proficiency cannot be assured if witnessed by an assistant who is not a qualified Instructor. The certifying Instructor must train and evaluate his students.

What then, does the assistant do? He may take charge of several students — four maximum on the *first* open water *scuba* experience — controlling them until the *Instructor* can individually evaluate their performance and proficiency. Assistants are invaluable in working closely with students in and out of the water in answering questions, passing on tips and techniques, giving reassurance, etc. And after the training and evaluation is complete and the *Instructor* is satisfied with student ability, the assistant may lead several students on a dive to gain additional experience.

As an Instructor, I have always worked with my students 1:1 in open water while qualified assistants were in charge of and closely watching remaining students.

The new standard can be a problem if you want it to be, but if you ask the question "How many people can I *really* control at once?", I think you'll find the standard is still too generous. If you, as an example, have 12 students in a class, it isn't unreasonable to require two assistants for the *first* open water *scuba* experience, and if conditions are a little rough, even that ratio is scary. Just think, while you're on the bottom in poor visibility with one student, two assistants are on the surface with 11! Those assistants had better be good!

Suppose conditions permit and you decide to take the entire class underwater at once. Assistants are essential to head and control the students to keep them from swimming off in all directions. I think handling four students underwater for the first time on scuba is plenty for one assistant. Once again, you do the teaching and evaluating — the assistant's job is to keep the students where they can learn.

What kind of ratios do you feel would be adequate if, heaven forbid, an emergency should occur? While you carry out your role as lifeguard, how many students will you now completely entrust to an assistant?

Stop and think. The day of the "Check Out" is gone. When students are taken into open water today, the entire exposure is a "Teaching Experience". Students should learn and be helped to learn from the moment they arrive and start gearing up until they depart for home. This is the assistant's greatest role — to help the student learn when the Instructor is giving his attention to another student. Assistants do not function as or replace Instructors.

The best possible way to use assistants is to use all NAUI Instructors, then if you want to turn them loose with students, you can be assured of safety. But remember, when you sign the form, *you* are certifying the student has the proficiency to be safe and effective in open water.

There are no short cuts to diving safety.

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POINT OUT NDA

THERE'S SOMETHING IN IT FOR YOU!

WHAT ELSE COULD HAPPEN ON ONE DIVE!!!

by E. A. "Jeep" Snyder NAUI 898

The dive boat left its dock in the morning with a group of divers aboard representing two different dive clubs. Therefore, everyone on board did not know each other. Each club had an odd number of divers. This problem was corrected by one of the experienced divers from our club taking a novice from the other club as a buddy. They knew each other, inasmuch as the novice was a previous student of the experienced diver.

As we got underway a fog bank was hanging over the coast which cleared up about three miles out. One club remained aft while the other club took over the forward section of the boat.

"Jeep" Snyder

The first dive was to 80' and there appeared to be no problems from either group. Between the first and second dive one of the divers from the forward section became sea sick, which again made an uneven number of divers. This meant juggling around for the second dive and taking turns with different buddies. After a 2-1/4 hour surface interval the second dive was made to 60'. The tables were used and safe times established. This dive was a short one made on a small wreck. The boat then moved on to the third dive site only a short distance from the second. Surface interval time was 1/2 hour. Safe times were again established. On this dive one novice followed two other divers. He became separated and being *without a watch* he ran over his safe no decompression time. This diver ran out of air at 60' and made a safe swimming ascent without ditching his weight belt. At the surface he dropped back down a short distance until he inflated his safety vest and bounced back up safely. We called to him and he signaled us on the boat that he was O.K. We called to him a few more times to check that he was alright, and he signaled back O.K. On reaching the boat he took another tank and went back down to 10'. We all did not agree on this move, but his club took over this procedure. Information obtained from his other club members indicated he was over his safe time by about 10-12 minutes. After the diver hung for 10 minutes he climbed back into the boat. As soon as he got aboard he was staggering. We removed his tank, belt, fins and vest then layed him on his left lateral side with his feet elevated. At this time we started to administer O_2. When space was available we moved him inside to a carpeted floor, where it was warmer. He was getting aches in his legs and arms along with coughs. The aches in his arms and legs could have been from the hanging on the anchor line, as the ocean was fairly rough.

The following incidents occurred from this point until the victim was discharged from the Philadelphia Naval Hospital.

We notified the U.S. Coast Guard of our problem. They could not dispatch a copter to our assistance due to a coastal fog bank. We requested a doctor and the Coast Guard sent a boat and doctor to our aid. In the meantime our boat ran aground in the fog. With the good manipulation of our captain we got free. Then while going up inland water way toward the Coast Guard Station and with a 3 way communication with the Coast Guard boat and Station – Are you ready? – the Coast Guard boat ran aground, and I mean aground!! We had to back track as they missed us in the dense fog. Positions were very hard to determine because the tide was running extra high and strong. In fact the buoys were laying horizontal under the surface and could only be seen if you got within 20' of them. We finally reached the Coast Guard boat and the doctor was transferred to us by a small whaler. We could not get to them because of the depth of the water.

In the meantime the victim had used up our supply of O_2. We had only one "D" bottle. (We now have two spares.) The first statement from the doctor was "we need to put the victim on O_2." I then informed him we used all we had which would have been enough if we had not run into the problems developing due to the fog. When we reached the Coast Guard Station the Beach Haven Rescue Squad was there with the O_2 and everything else needed to help the stricken diver. They were a cracker-jack unit.

The Coast Guard had made arrangements for use of the chamber at the Philadelphia Navy Yard when the victim arrived. A copter could not be obtained near by because of red tape, so one was being dispatched from Brooklyn, New York. After

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WHAT ELSE COULD HAPPEN! . . . (Cont.)

waiting an hour or so for the copter, word was received that it had made a forced landing about 12 miles from where we were waiting. The victim was in the ambulance all this time on O_2 and attended to by rescue squad members.

The only possible means of transporting the victim to the Philadelphia Navy Yard now was that of the Beach Haven Rescue Squad. They drove the victim to Philadelphia and he was admitted to the chamber approximately 11 p.m. This episode all began about 4:00 p.m.

The diver spent approximately 4 hours in the chamber and then 24 hours in the Naval Hospital before being released.

Benefits Derived from This Experience Are:

1. The diver should not be a *Third Party*.
2. A diver should know his equipment (especially when borrowing) as he had no reserve with the borrowed equipment he used on third dive.
3. A diver should have his own watch.
4. Each diver's name and phone number should be recorded on the dive sheet. There was confusion trying to find the victim's wife for consent to put him into the chamber.
5. We now have sheets to be filled in by each diver while he is in the proper state of mind, giving permission to be put in a chamber.

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INFORMATION REQUESTED FOR HIGH ALTITUDE DIVING WORKSHOP

The Director of NAUI's first High Altitude Diving Workshop hopes to involve as much experience and research in the field as he can. The workshop will be held August 24-25, 1974, at Lake Tahoe, Nevada.

Because the field of high altitude, fresh water diving is new, there is room for much input, according to Bob Tolar, the Workshop Director. He is planning lectures and original research presentations in High Altitude Decompression, High Altitude Diving Techniques, Physical, Chemical and Biological Limnology - and there will be ample opportunity for ideal diving in clear water.

Tolar expects attendance from all over North America because the field of High Altitude diving is so new. The Workshop will interest researches in High Altitude Diving and Limnology, Diving Instructors and anyone interested in diving in different places. Lake Tahoe also offers everything from excellent night clubs to gambling and fine food.

Bob Tolar may be contacted at 1308 La Loma Drive, Carson City, Nevada. Anyone with research of experience in High Altitude Diving should contact him there.

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NAUI – YMCA TALKS

By Arthur Ullrich, General Manager

In recent months members of the NAUI Board of Directors and the YMCA National Scuba Committee have held formal talks on how the two organizations can work together. There were discussions of various methods on how the two organizations could effectively operate as one. However, at this point there are no plans for a formalized merging of the organizations.

The two groups have pledged to seek ways in which they can work more closely.

One important aspect to keep in mind is that almost all the members of the YMCA National Scuba Committee as well as Ken Brock, YMCA National Scuba Director, are current NAUI Instructor members. I point this out because we often hear other organizations referred to as "Those Guys". In this case as in many other cases, "Those Guys" are "Us". But most of all, we have the same goals in mind – "Safe Diving".

In future months renewed efforts will be undertaken to bring the groups closer.

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ANCIENT (NAUI) INSTRUCTORS ON HOW TO BE A LEADER

The most intelligent leaders bring about results without making those controlled realize that they are being influenced.

The less intelligent seek to motivate others by appeals to loyalty, honor, self-interest, and flattery.

The worst try to force others to improve by condemning their conduct.

The intelligent will be careful not to speak as if he doubts or distrusts his follower's ability to do the job suitably.

– Lao Tzu

COMMENT AND DISCUSSION

Articles and letters received on the subject matter of the articles and editorials appearing in NAUI News will be presented here with editorial comment. All views expressed by authors in this section are those of the author and do not necessarily reflect the policies of NAUI.

ALTITUDE AFTER DIVING

by C.L. Smith NAUI 2299

The October/November NAUI News contained some interesting discussions by Michael Buck (NAUI 3266) and Jon Hardy on flying after diving. Diving in the ocean, followed by ascent to some altitude, differs from altitude diving in two respects: bottom time is accumulated in sea water rather than fresh, and a time interval separates the ascent to surface from the ascent to altitude. While I agree in principle with the recommendations advanced by Buck and Hardy, I feel that in many circumstances they are over-restrictive. A different procedure is offered here for determining when and after what an ocean diver may safely rise to altitudes above sea level. It should be of interest both to those who fly after diving and to those who must drive into the mountains. The policy is incomplete in that it does not cover the longer exposures. In those cases, I feel the twelve hour rule is best, and I would not recommend the procedure following decompression dives.

Several things must be said about ascending to altitudes after an ocean dive. First, the danger is a matter of degree, and some quantitative policy is necessary else none of us would be able to go home. Second, driving into the mountains is as important a concern as is flying.

The Procedure

The suggested policy is much more liberal than waiting twelve hours, and accounts for the more usual range of depths and times. Within this range it is quite conservative, permitting one to dive normally while keeping track of both his depth and his sea level repetitive dive group. It requires only that the diver wait at sea level until a certain repetitive group letter is reached before ascending to altitude. The highest safe group letter for various depths and altitudes is given in Table 1. The depth to be used is, conservatively, the deepest one of the day. For example, a dive to 80 feet for 26 minutes would place a diver in Group G after surfacing and spending ten minutes. He should not ascend to 8,000 foot altitude until he reaches Group E according to Table 1, a surface interval of some two hours. The worst situations occur at depths near 100 feet, where a wait of more than three hours may be necessary before going to 8,000 feet. In all cases shallower than 140 feet, a simple wait of three hours will permit flying in a cabin pressurized to 5000 feet. Table 1 suggests no group letter for certain extreme cases of altitude and depth. In those cases I can only recommend an interval of twelve hours, although in border line situations the daring may wish to choose Group C.

TABLE I

Highest Permissible Repetitive Dive Group Letter to Ascend to Indicated Altitude

Dive Depth in Ocean, Ft.	Altitude, Feet Above Sea Level							
	Zero	2,000	4,000	6,000	8,000	10,000	12,000	14,000
10	0	0	0	0	0	0	0	N
20	0	0	0	0	N	L	J	J
30	0	0	N	L	J	J	J	I
40	N	L	J	J	J	I	H	H
50	L	J	J	I	I	H	H	G
60	J	J	I	H	H	G	F	E
70	J	I	H	H	G	F	E	D
80	I	H	H	G	E	E	D	D
90	H	H	G	E	E	D	D	D
100	H	G	E	E	D	D	D	D
110	G	E	E	D	D	D	D	–
120	F	E	D	D	D	D	–	–
130	E	D	D	D	D	–	–	–
140	E	D	D	D	–	–	–	–
150	D	D	D	–	–	–	–	–
160	D	D	D	–	–	–	–	–
170	D	D	–	–	–	–	–	–

The Rationale

The limiting repetitive dive groups given in Table 1 for each altitude and depth are based upon an interpretation of Table 1 – 11 of the U.S. Navy Diving Manual. That is that the repetitive group

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ALTITUDE AFTER DIVING . . . (Cont.)

designator given for a maximum no-decompression dive represents a maximum pressure ratio allowed for direct ascent from the indicated depth. Thus the letter H associated with a limiting dive to 100 feet is taken to mean that in Group H, a diver may safely ascend through a pressure ratio of four-to-one without decompressing. Similarly, assignment of Group N as the limit at 40 feet associates that letter with direct ascent through a pressure ratio of 2.2. A correlation of depths, depth-to-surface pressure ratios and repetitive group letters is given in Table 11.

TABLE II

Relation Between Highest Allowable Repetitive Group Letter and Ascent Pressure Ratio

Depth In Sea Water, Ft.	Pressure Ratio to Surface At Sea Level	Max. Allowable Group Letter for Direct Ascent
35	2.05	O
40	2.21	N
50	2.52	L
60	2.82	J
70	3.12	J
80	3.42	I
90	3.73	H
100	4.03	H
110	4.33	G
120	4.64	F
130	4.94	E
140	5.24	E
150	5.55	D (5 min. limit restricts diver to C)
160	5.85	D
170	6.15	D
180	6.45	D
190	6.76	D

The rationale for the suggested procedure is that, if Group H permits surfacing through a pressure ratio of 4, then ascending to an altitude having a pressure one fourth that of the depth dived must be allowed in H. Note that account is taken of the depth; it is *not* assumed that a large ratio from the surface to altitude is safe, or that a single letter can be given for each altitude.

The pressure ratio from depth D to altitude is simply $[(D + 33)/33]\,[14.7/P_1]$, where P_1 is the absolute pressure at the alitude of interest. At 5,000 feet atomospheric pressure is about 12.23 psia. Thus direct ascent from 50 feet to that altitude would represent a pressure ratio of 3.02, a value associated with Group J. Group letters lower than D are not given in Table 1, simply because the Navy Table 1-11 does now show any limits less than D on which to base calculations. The letter C shown for 150 feet is not in itself a limit but only reflects the amount of nitrogen accumulated in the maximum time allowed. **-NN-**

SUBMERGED DIVER RESCUE

Charles V. Brown M.D

In answer to Gary Cordell's request (NAUI NEWS Aug/Sept 73) for comments on his submerged diver rescue assumptions, I offer these. If seawater in the larynx has caused laryngospasm, don't expect mere displacement of the water by air to terminate the spasm. The irritation was considerable, and the spasm will likely persist till terminated by hypoxia.

The question of the best way to bring up an unconscious diver has not been settled. I'm told (3rd hand) that IQ_5 in Toronto brought out the experience of a physician who had himself anesthetized at depth, then brought to the surface in a head up attitude, without embolizing. If so, this deserves a medal for bravery and a Walter Reed Soc. membership, but all it really tells us is that if you give your victim a quick anesthetic, you can grab his hair and tow him up with impunity.

Anesthesia is designed to relax muscles and prevent laryngospasm, so the situation is not at all analogous to that of a stressed and distressed diver, full of adrenaline, who has just lost consciousness and maybe has seawater tickling his larynx.

One pertinent clue comes from drowning statistics. Only about ten percent are of the dry lung variety implying laryngospasm. Still we can't rule out the possibility that some of the wet lung cases had transient laryngospasm.

At this stage of our knowledge I would favor the feet first ascent, since water would be less likely to hit the larynx, and since any embolus would be less likely to hit the brain. Neck extended, jaw forward, air in mouth should all be helpful.

But we've got to play the odds. I assume that for an unconscious diver at depth, the risk of death by hypoxia far exceeds the risk of death by embolism. Therefore, the best way up is the fastest way up. If there is trouble maintaining a preferred

DIVER RESCUE . . . . (Cont.)

attitude, speed takes precedence over position. Similarly, manipulations involving a regulator should not be allowed to slow the ascent.

Exceptions might be the victim who appears semiconscious but struggling, or the one convulsing or vomiting. A moment's delay till activity stops could be warranted, since in these cases a closed larynx is likely. Yet I'm not sure even this justifies much delay, for you can raise such a person some distance before his chest reaches the danger point of maximal expansion (tables in same News), and ten seconds saved may affect the outcome.

– END OF COMMENT AND DISCUSSION –

-NN-

NEW BOOK FROM NAUI

SAFE CAVE DIVING

by Tom Mount (NAUI 2423)

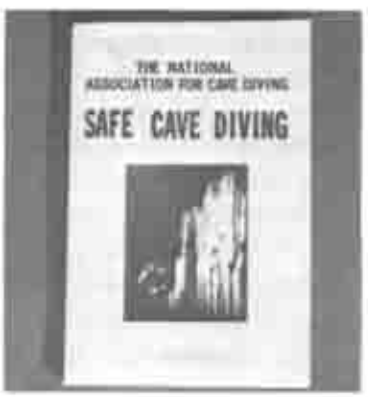
196 Pages – Illustrated.

This new 16 chapter text is highly informative and well prepared.

It provides insight into cave diving environment, history, specialized training, safe philosophy, life support systems, body positioning and control, lines and reels, planning, air consumption, equipment maintenance, medical aspects, plus stress in diving and photography. This is the first such text of its kind ever produced in the United States.

A must for all cave divers and those planning to become involved in cave diving and cave diving training.

The text is now available from NAUI Headquarters. Price – $7.50, NAUI Instructors – $6.50.



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National Association of Underwater Instructors

IQ6

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We'll See You . . .
Here . . . OCTOBER 4, 5, 6, 1974

and Here . . .

IN-HOUSE NEWS

POSTAL RATES TO INCREASE

by Arthur Ullrich, General Manager

A major postal rate increase is on its way. We can expect First Class and Air Mail rates to go up 2 to 3 cents the first of the year.

Some postal rates have already hit home. We are now required to use BOOK RATE instead of special Fourth Class rates we were permitted to use for almost 4 years. It should come as no surprise that postal rates are going up – everything else has also.

For some years we saved because we were able to deal in large volume of materials such as emblems, books, printed matter, etc. We have reached the end of the rope on many items because we are now obtaining the materials at the best volume discount available. As a result, there is no more volume to increase and therefore, no more ways to cut the cost. Costs are going up and the assessments the organization must charge the members must increase to keep pace.

You will note on future order forms that some publications, materials and services will increase in price. On future book orders, a small postage and handling assessment will be imposed to defray the increased rates. These increases are undesirable, but essential if the organization is to continue to offer these services.

In comparison to the increase in the cost of beef and gasoline, you won't even notice these.

-NN-

EVERY MEMBER GET A MEMBER IN '74

Each year when we have a chance to talk to new members during Instructor Certification Courses we ask the question, "How did you find out about this course?" The answer we get most often is, "A NAUI Instructor told me about it."

Word-of-mouth is known to be the most effective method of advertising or promoting any product, event or service.

This year again we hope that each member will tell a prospective member about NAUI and NAUI Instructor Courses. If you take the time to encourage just one qualified applicant to attend, you will have made not only a major contribution to NAUI, but greatly advanced professional underwater instruction.

In just a few weeks you will be receiving a special information package with full details on all 1974 programs. After you have reviewed it, please put it in the hands of a future member.

"EVERY MEMBER GETS A MEMBER"

It will only take a moment of your time, but it may change the life of another.

-NN-

REMINDERS OF IMPORTANT CHANGES . . .

1. Branch Changes: Boundaries have been changed and two additional Branch Managers appointed. Check to see who your Branch Manager is and get to know him. See December NAUI News, page 15, for realignment. The Islands of the Pacific, including Hawaii, are assigned to the new South Pacific Branch.

2. Insurance: A new, world-wide policy with choice of coverage to $1,000,000 is now available at attractive premiums. Full explanation in this issue.

3. Financial Responsibility: Active (Teaching) members are now required to demonstrate financial responsibility to maintain a Teaching status. See the new insurance article in this issue. Also see January '73 NAUI News, pages 6 and 7.

4. Instructor Courses: After June 1, 1974, the ICC will be replaced by the Instructor Qualification Program (IQP) and the Instructor Training Course (ITC). See December '73 NAUI News for details and start preparing your assistants now.

5. Course Standards: Several changes to the general standards for NAUI diving courses went into effect on January 1. See October/November '73 NAUI News to review these changes and make the necessary adjustments.

-NN-

NDA NAUI

"SAFETY THROUGH CONTINUING EDUCATION"

— IN-HOUSE NEWS —

LITTLE THINGS MEAN A LOT.

Helping Headquarters to reduce overhead benefits the membership. This gives a greater margin of the budget for use in serving our instructors and for developing new products and services.

Small things you can do to help add up to a big savings with volumes in the tens of thousands. To illustrate this, here are four small things you can do to save all concerned much time and money:

1. Be neat on your Student Registration Forms. Type or print neatly. Include *all* information on *each* Form.

2. Tell your students to record the information from their certification card and keep the information where it can be found if their "C" card is lost. Too much time is spent researching information for replacement cards. The card info can be recorded on the wall certificate that is part of the $2.00 registration fee or in the NAUI Diving Log and Training Record - a great way to encourage continuing education for your students.

3. Send cash on small orders, or wait to include a low cost item with a larger order. It takes time and money to process a check.

4. Always include your return address on any correspondence and include your full name. There are a lot of "Bob's" in NAUI. If your signature is illegible, please print your name also.

These steps may seem insignificant to you, but when NAUI registers 100,000 divers per year, little things will mean a lot!

-NN-

HELP WANTED ON 1974 NAUI INSTRUCTOR HANDBOOK

The 1973 edition of the Instructor Handbook includes many revisions and additions.

It is now time to start to work on the 1974 edition. There are still a number of areas that need work.

Take a look at areas you would be willing to work on.

If you have some ideas, suggestions or material you feel should be added then let us hear from you. Don't let this one get by you.

Ross Bachman (NAUI 0413) is still listed as the Editor. Ross has given a great deal to the development of the existing Handbook. For the last two years Jon Hardy, NAUI Projects Director, managed the project of changes, revisions and additions. A great deal of credit must go to both for their work.

There is more work ahead. The foreword in the Handbook outlines the need for growth, change, flexibility and the need for improvement.

Write Handbook Editor, NAUI Headquarters.

-NN-

WHAT'S NEW?

→ The Instructor Directory is finally finished! Members can expect to receive a copy soon. Please send any corrections as soon as you have had the opportunity to review your listing.

→ The NAUI International Bibliography with nearly 1500 entries on subjects related to diving is now available. Steve Collins, NAUI 302 did an excellent job in arranging this easy-to-use Reading List. This reference, invaluable to instructors is available to members at only $1.00 per copy. Send cash, or wait and include the Bibliography with your next order. Write Headquarters for yours.

→ NAUI Instructors can now teach the new Specialty Diving Courses listed and described in the October/November '73 NAUI News. A few reminders before you charge off to outline the course:

1. Approval to teach the course must be obtained from your Branch Manager.

2. Certification credentials are not yet available. Certificiation will be retroactive provided the standards are met. Teach now and watch for announcements before registering your students.

Also — Support materials for the Specialty Programs are badly needed. Please send copies of any references, outlines, handouts, etc. to Headquarters.

-NN-

ARE YOU IN?

Membership expired August 31 of '73. Have you renewed? Recertification requirements are in effect for 1974. These requirements can be easily

CONT. ON NEXT PAGE

— IN-HOUSE NEWS —

ARE YOU IN? . . . (Cont.)

met by active instructors. Waivers for recertification requirements may be obtained from your Branch Manager.

NAUI will continue to offer more services each year, so if you have not received a renewal form, please contact us and get back in.

In 1973 NAUI boasted that 2/3 of all members *ever* certified were still active members of the organization. Let's continue this enviable record in '74.

NAUI means more than the ability to teach diving. NAUI is you. If you have a dream or idea, get back in and make it a reality.

SPECIAL CALENDAR FOR INSTRUCTORS

Feb. 11, 1974	Central Branch Coffee Hour, Chicago, IL. Contact: NAUI Central Branch, Box 14156, University Station, Minneapolis, MN 55414.
Mar. 30, 1974	Orange County Instructor's Dialogue, Santa Ana College, Santa Ana, CA. No Charge. Contact: (see Jan. 19).
May 11, 1974	Diver Rescue Workshop, New Rochelle, N.Y. Contact: Dave Michael, 27 Concord Road, Acton, MA 01720.
June 8, 1974	Orange County Instructor's Dialogue, Santa Ana College, Santa Ana, CA. No Charge. Contact: (see Jan. 19).
July 20-21, '74	Instructor Qualification Programs • New York, NY • Portland, ME • Rochester, NY • Providence, RI • Manchester, NH • Albany, NY • Hartford, CT • Boston, MA • Worcester, MA Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, MA 02117.

WHAT'S YOUR SCHEDULE?

LETTERS

Letters of interest received by NAUI Instructors, Branch Managers, Board of Directors, Headquarters and the NAUI News Editor will be presented in these columns.

Dear Art,

I had talked to you on the phone on Thursday, Dec. 6. I have decided to write you a letter giving you the particular names of some relatives that I am trying to locate. I have spent considerable time and funds trying to locate: CHARLES (CHUCK) IRWIN MAZE, who will be 43 years old this Christmas, who is the father of MARK CHARLES MAZE (16) and his sister MELISSA LORAINE MAZE (15). All the above mentioned are from San Diego, California. They all have blue eyes, are slender to athletic in stature. MARK has blond hair, MELISSA, darker blond to brownish and CHUCK has dark brown hair.

CHUCK and MARK were avid skin divers and may very well be certified scuba divers by now.

Could you contact your member instructors and ask them if they remember any such described persons attending class or meetings? Any information on these individuals should be forwarded to PAT KENNEY at 17439 KINGSBURY ST., GRANADA HILLS, CA. 91344.

Thank You
Pat Kenney

Dear Sir:

This year I involved myself with the arts and skills of learning scuba diving. So far I have taken to diving as a duck takes to the water and more than enjoying every moment preparing for a dive and also the ultimate, the DIVE! So before going any farther, I would like at this time to thank you for helping make scuba diving so very enjoyable.

Through the diving experiences so far, I have found several things which happened to me. "Adventure." The adventure of a complete new world and seeing how the other world functions and survives. "Awareness." The awareness with which the sport naturally brings and the by-

CONT. ON NEXT PAGE

LETTERS – (Cont.)

products of physical fitness, building self confidence, mind control, and safety for yourself and for your fellow friends. These abilities and attitudes carry over to everyday life which just has to help everyone who comes in contact with the by-products. "Yearning." The yearning to further my education in diving so as I can teach others the safe way to dive and enjoy the underwater world, which brings me to writing you.

I would very much appreciate, with your help, becoming a NAUI Instructor and to help have workshops to make diving more safe and enjoyable.

Lloyd D. Bonjour

We receive letters of all kinds at your Headquarters: informative, complaining, enthusiastic. This one makes our job worthwhile. If this is what NAUI can do for one man, what must it do for all those who remain silent? LET'S HEAR FROM YOU.

I am writing concerning the workshop on medical aspects and lifesaving, held in Santa Barbara. It was Fantastic the exchange of ideas, the lectures, and the practical experience in the water was great.

I feel these workshops are the best thing that could happen to NAUI, and I hope to see many more in the future.

Thomas Harbin
L-23
A-3871

I am enclosing a check for $2.50 for the Diver Log Book and Training Record Book. I would appreciate a quick response for I am going on a Bahama vacation. **(I recently took a NAUI course and commend you on the professional attitude of the instructor Ken Tate No. 2391.)** Thank you very much for your cooperation.

Art Toms

EMPLOYMENT

Due to the large number of requests and success of past listings, each month NAUI News carries both instructor's needing positions and positions which are open. Please send listings to the Editor, NAUI News. Each listing will be run once, and you may request to have it repeated if necessary.

EMPLOYERS NEEDING INSTRUCTORS

Scuba Inc., P.O. Box 1481, Newport Beach, CA. 92663, (714) 675-0555, Ask for Tom Murphy.

International Diving Safety Foundation (IDSF), 9465 Wilshire Blvd. S-610, Beverly Hills, CA 90212, (213) 473-9494.

Needs a large number of Instructors, full or part time. Contact B. Gilson.

INSTRUCTORS NEEDING POSITIONS

Nello DeMarco NAUI 2638, 11 Vireo Street, N. Providence, RI 02904, (401) 353-1667.

SUMMER EMPLOYMENT WANTED IN '74

NAUI Instructor desires full time employment for summer of 1974 outside of continental USA (Hawaii O.K.) Has been continuously teaching scuba part and full time for five years. Certified Secondary School teacher. Single. Ministerial Student. Contact: George Gera (NAUI 1374), Box 192, Southern Baptist Theological Seminary, 2825 Lexington Rd., Louisville, KY, 40206.

NOTICE

Because of price increases in various materials and services, NAUI will be forced to modify its price structure in the months to come.

Specific changes will be announced as far in advance as possible. This notice is necessary because all suppliers and vendors are giving NAUI the same kind of notice.

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PHONE (916) 445-3405

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TWENTY-FOURTH SENATORIAL DISTRICT
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CALIFORNIA LEGISLATURE

Senate

MEMBER, SENATE RULES COMMITTEE

NAUI members and Headquarters wrote and called numerous times to stop this bill.

August 31, 1973

Mr. Lee Trivette
7466 San CArpino Drive
Goleta, California

Dear Mr. Trivette:

I am pleased to advise you the Senate has killed SB 578, relating to compressed air and gas. It only received 8 aye votes, 21 required for passage.

I voted against it in the Senate Finance Committee as well as on the Senate floor.

Yours sincerely,

Robert J. Lagomarsino

ROBERT J. LAGOMARSINO

RJL:et

Editors Note: Lee Trivette is a NAUI Certified Diver, an NDA member and an officer of the local dive club. He wrote to senator Lagomarsino expressing his concern for the Bill. It is gratifying to note this response.

NAUI is a tax exempt non-profit professional organization. All proceeds are used for the operation of the Association and the promotion of safe diving. Contributions, bequests and gifts are deductible by the donor.

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