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FATHOMS



VICTORIAN SUB-AQUA GROUP

(Official Organ of the Victorian Sub-Aqua Group)

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CLUB MEETING -

The next Meeting of the Group will be held on 21st November, 1969, at the Victorian Association of Youth Clubs Hall, Gisborne Street, East Melbourne, opposite St. Patrick's Cathedral at 8.00 p.m. sharp.

PROTECTIVE CLOTHING

Cold water has always been a problem for divers, and one that many of us regularly meet. Although a resting unclothed man can stand low temperatures in still air, he is quite incapable of adapting himself similarly to cold water. This is due to the vastly greater heat loss during immersion, in fact, man is unable to maintain a normal body temperature at rest in water much cooler than a luke-warm domestic bath (96°F).

Cooling of the body, more precisely termed hypothermia, at first calls into play protective measures by the body to conserve heat; the small blood vessels to the skin, especially of the hands, feet and limbs, are closed. These parts are allowed to cool while the temperature of other more vital organs is preserved. This protective mechanism is not, however, so effective in the head and neck where such vital organs as the brain and spinal cord are near the surface. Later, shivering occurs as a means of producing extra heat, and when this defence fails the deep body temperature begins to fall with a consequent slowing of reflexes and movement, and an impairment of thought and judgment. Eventually coma and death from drowning, or arrest of the heart, results.

Those well endowed with a natural covering of fat will survive far longer than the small and skinny, and vigorous exercise also has a protective effect by promoting body heat production. Thus each summer we have the spectacle of channel swimmers flailing their way across the Straits of Dover unscathed, in conditions where the thin and less fit would soon succumb.

Unfortunately the present day aqualung with its limited air capacity places a premium on slow unhurried movement in order to conserve air, while obesity as a method of keeping warm has little to commend it, as it usually betrays a lack of physical fitness.

It follows from this that for comfort and safety a diver will need some form of protective clothing for all but the warmest of tropical waters. In addition to its prime purpose of providing thermal insulation, the clothing also gives welcome physical protection against abrasions from rocks, coral, jagged metal and similar hazards.

There are two basic types of diving dress, the dry suit and the wet suit. Neither of these is completely satisfactory and they each have different fields of usefulness.

Dry Suit. The dry suit is loose fitting and is made of rubber sheet or rubberised fabric with thin rubber seals at the neck and wrists to exclude water. In itself rubber is a poor heat insulator

but the suit is worn with sufficient woollen underclothing underneath to provide the required protection.

Dry suits commonly available are of two main types as follows: The one-piece, neck entry, suit is a robust outfit entered via the neck of the suit and sealed after entry either by a separate and easily replaceable thin rubber neck seal or a hood which is clamped to the suit by a "dog collar" at the neck. Its disadvantages are the need for assistance to get into it, and the bulk of its collar.

The two-piece suit consists of jacket, trousers and cummerbund. They are joined together at the waist by thin sheet rubber seals which are rolled together after entry and held in place by the cummerbund. While these suits are easier to put on, the large thin seals are easily damaged and, because they are glued to the suit, difficult to replace. The bulk of the rolled up seal is inconvenient at the waist where weight belt and aqualung are frequently fastened.

Other types of dry suit exist, differing mainly in the method of entry and manner of sealing the suit.

Difficulties in the use of dry suits mainly arise from compression or the escape of the air trapped in the suit. As the diver descends and pressure rises the volume of this air decreases in accordance with Boyle's law. As the air volume shrinks, the suit is pressed more and more tightly to the diver. It compresses his clothing and becomes rigid and the so-called "squeeze" effect results. Ultimately, when the clothing cannot be compressed any more, the air pressure in the suit can no longer be affected by outside pressure and a relative vacuum is produced. This causes bursting of small blood vessels in the skin which also becomes pinched in folds of the clothing. When a hood is worn instead of a neck seal, bleeding into the external ear passage may result - known as "reversed ears". The compression of air in the suit also results in considerable loss of buoyancy.

These difficulties can be circumvented in two ways. The simplest is merely to commence the dive with a surplus of air in the suit which will be compressed at the expected depth of the dive to a comfortable volume. Provided a shot line or anchor rope is available to assist in overcoming the excessive buoyancy during the initial stages of the descent, this is a satisfactory solution.

A more elegant way is to provide some method of inflating the suit at depth as required. This can be from a small compressed air cylinder operated by a hand wheel, or by taking a supply from the aqualung. This system has the additional advantage of providing a considerable degree of control over buoyancy. On ascent surplus air has to be bled off, usually via the cuff seals. Some may prefer to have valves at neck and ankles to do this automatically, but in practice these valves often leak water into the suit.

A logical development from this idea has been the French constant volume suit in which the half face mask is an integral part of the hood. To inflate his suit the diver has merely to blow air past the edges of his mask. Surplus air is vented through valves at ankles and head.

Flooding of a dry suit after a tear can be a serious problem not merely because of the sudden chilling but also from the rapid loss of buoyancy which may result, especially if automatic vent valves are fitted.

Dry suits are particularly valuable for long period of diving especially when in dirty, cold or polluted waters.

The Wet Suit: In this no attempt is made to make it water-tight, and in contrast to the dry suit it is essential that it be a good fit to minimise the amount of cold water entering the suit.

The most primitive and still useful form of wet suit was the wearing of warm woollen clothing - sweater, combinations, socks and gloves - preferably with some close-woven garment on top to diminish water flow through the material. This will give a quite useful increase in comfort and endurance over the unprotected diver.

A development of this, the porous sponge rubber suit, was more elegant but otherwise worked in the same manner, but this has now been entirely superseded by the use of expanded foam Neoprene. This material consists of a dense foam of nitrogen bubbles in Neoprene rubber. There is a skin of smooth Neoprene on one or both sides and often to give additional strength and ease in dressing nylon material is bonded to the surface. Neoprene is supple, light, a good heat insulator and easily tailored. Usually a complete suit comprises jacket and trousers with separate hood, gloves and boots of the same material. For cold water use an undervest of Neoprene is often added. Flow of water through the suit is reduced to a minimum by skintight fitting and by giving a generous overlap between different parts of the suit. The jacket is fitted with a lock strap to prevent its being pulled away from the trousers in use and usually it has a zip down the front to facilitate dressing.

The advantages of Neoprene suits include comfort, ease of dressing with comparative elegance, easy manufacture and repair, good physical protection of the diver, and buoyancy.

In spite of its almost universal use for club diving, Neoprene suffers from some drawbacks, all associated with the compression of the nitrogen in the foam under pressure. This causes thinning of the material at depth with resulting loss of buoyancy and

and effectiveness as a protection against cold. The material halves its thickness at a depth of 65 feet and is down to a third at 165 feet. Heat loss varies rather more than this being double at 65 feet and four times bigger at 165 feet. Thus a suit which gives adequate protection at the surface may be quite inadequate during a dive. Fortunately, the effect of this is not so serious as might be imagined because the aqualung has a somewhat parallel loss of endurance with increasing depth and the diver runs out of air before he is dangerously chilled. Nonetheless, with the advent of larger capacity breathing sets and the extension of the diving season further into the winter this is becoming a bigger problem.

Buoyancy varies considerably with depth, being halved at 33 feet and down to one-tenth at 165 feet. Thus a diver needing a 20 lb. weightbelt at the surface for neutral buoyancy will be some 18 lb. overweight at 165 feet. In practice of course, a diver uses the weight he will require to achieve neutral buoyancy at the planned depth of his dive. This leaves him with useful excess buoyancy at the surface. What is less desirable, however, is that if he descends deeper than expected he becomes negatively buoyant and sinks. In deep water, especially in poor visibility, he may be overcome by narcosis before realising what is happening. This has caused several disasters in the past.

Where decompression stops are needed, it may be advisable to tolerate some excess weight on the bottom. This will enable the diver who has surfaced some way from the boat to swim back to the shot line at his correct decompression depth without being forced to surface by excessive buoyancy.

Care of Suits. The rubber seals of dry suits and the inside of unlined Neoprene suits should be dusted with talc before dressing. Nylon lined suits do not need this preparation but are easier to put on if dry.

After use all types of suit should be rinsed free of salt and dirt, and dried, and all unlined rubber and Neoprene lightly dusted with talc before storage. They should never be left in the sun, stored in a hot place or be allowed to become contaminated with oil or grease, all of which deteriorate rubber and the adhesives used in bonding suits.

Hands. While many divers prefer to use bare hands as much as possible, it is advisable, because of softening of the skin on immersion, to wear some form of protection such as cotton or leather gloves. Cold water is a good anaesthetic and it is all too easy to spoil a holiday by cutting oneself unawares on some snag.

Remember that cuts and abrasions exposed to salt water heal slowly and often scar badly.

Adequate thermal protection of the hands in cold water is a difficult problem due to the large surface area exposed by the fingers. Mitts are relatively warm but difficult to do useful work with. They can, however, be taken off as necessary for short periods. Five-finger foam Neoprene gloves are available but not really adequate in cold water.

Head and Neck. As explained before, the head and neck are a serious source of heat loss. It is essential that the hood, if of Neoprene, is at least as thick as the suit itself. With a hooded dry suit a balaclava helmet may be worn underneath to increase protection. With a hoodless dry suit the use of a foam Neoprene hood is probably the best solution. In spite of these measures, full protection of the head is not possible because of the need to use a mask and mouthpiece.

General Hints. It is equally essential to avoid chilling before and after diving. Adequate weatherproof clothing should be worn on board boat or while waiting around on cold and windy beaches. Wet diving gear should be discarded immediately after use unless required as a temporary protection from foul weather. Hot water poured through the suit will go some way towards restoring body heat while a supply of hot drinks will do much to restore morale.

Any diver who looks or feels cold, especially if he is shivering uncontrollably, may well have suffered a fall in body temperature. It is difficult to confirm the diagnosis unless a rectal temperature is taken and shows a reading below 97.4F (normal rectal temperature 99.4 F), but as a working rule any diver who feels cold and is shivering uncontrollably should be treated as suffering from hypothermia and rewarmed as above. A severe case should be put in a warm bath as soon as possible. It should be remembered that it can take two or three hours for body temperature to be restored and in the meantime reactions are slowed and judgment impaired. This may be doubly dangerous when decisions affecting other people's safety are required or if a car has to be driven home.

Cold. The body responds to cold firstly, by closing down the small blood vessels of the skin, and then by mobilising energy stores to produce increased bodily heat. The aim is to conserve body heat and increase production to balance the loss. Civilised man assists nature by choosing his clothing to cut down heat loss

increasing his dietary intake, and regulating his heat loss by heating his environment. Nature's aim is to keep a constant body temperature throughout the central nervous system, the muscles and body generally, and the skin. When net heat output continues for long periods, the body is unable to respond efficiently in the water, and fatigue, unconsciousness and drowning supervenes.

Preventing of net heat loss in diving activities is of utmost and continuous importance, and can form just as much a limit to diving activities as the capacity of air cylinders. Those limits must be borne in mind in dive-planning. The body can learn to adapt to cold by increasing exposures, so, once again, training and fitness assume importance.

A few facts should be borne in mind to emphasise the extent of the problem. In the open-air the human body gives out heat mostly by radiation and directly, and this is increased by ventilation. Sweating and exhalation of water vapour gives out a smaller amount. When the body is in the water rather than in air, it is in a substance whose thermal capacity is four times that of the air, where heat conductivity increases by twenty-five times; and where the diver's mobility is constantly heating up fresh water. Some compensation arises by the increased heat capacity in the muscles, but more oxygen will be used. This requires more air and reduces the diver's duration: i.e. at 27°C a diver uses 0.82 litres per minute, whereas at 90°C he will use 1.7 litres per minute.

As the body cools, the various effects are:

The production of "goose pimples" - the muscular contractions of small muscles at the base of hairs.

Fine muscular tremor and a chilling sensation.

Cyanosis of skin and mucous membranes - blueness - followed by more serious signs; changes in the nervous system, circulation and respiration; a slowing down of pulse and respiration; stiffness and then pain in the muscles; paralysis of vocal cords and hiccough.

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PAST OUTINGSOCTOBER 19 - PHILLIP ISLAND

Five divers turned up for this dive and had a wonderful time. They met at San Remo and then proceeded to Pyramid Rock where they dived on the lee side as there was a bit of a swell running on the ocean side. They noticed that the abalone had been nearly cleaned out and fish life was very scarce. The president spent 15 minutes coaxing a large cray from its habitat and once captured it was found to be a female with many eggs aboard and had to be released. The visibility was quite good; about 30 to 40 ft., and the maximum depth attained on the day was 40 ft. but as there was nothing at that depth except fine grained sand, most of the time was spent in the 25-35 ft. region.

The turn up for this dive was disappointing as the weather was beaut, the water warm, and the company good. Members should try to participate in all functions that the club runs, because it is only by your participation can we grow into a strong, healthy organization.

NOVEMBER 2 - EPOLLO BAY

Because our club was relying heavily on a proposed boat trip that was being organised by a member of another club, and didn't eventuate, this dive was transferred to Sandringham Breakwater.

A lot of members contacted R. Addison and eventually six divers turned up at Sandy. The weather was cool with the hint of rain and a choppy sea.

All divers entered the water by 2.15 p.m., including Geoff. Cook, our newest members, who gained the launching spot with a little difficulty but who enjoyed himself immensely once in the water. His only complain was that owing to not having a lung, he couldn't get below to where the interesting things were going on.

As usual Paul Beecher had to be coaxed out of the water as he seems to have found his natural forte in the under-water world. The only reason he climbed out of the water in the end, was that everyone was packing up preparing to go home, and his diving buddy was blue with cold and going crook.

We still need more members turning up for dives, but in weather like Sunday's it is gratifying to see this many turning up.

TREASURER'S REPORT

Accounts have now been sent to all delinquent members of the group. It is impressed on all those members who do not pay up that, in accordance with the group's constitution, they can not resign until financial and so can be held responsible for any debts that the group incur. So, if you wish to terminate your membership, it is advisable to become : financial first, then send in a letter of resignation. This simplifies the book-keeping of the group **A CONSIDERABLE AMOUNT AND IF IT IS DONE IN THIS manner it will earn my undying gratitude.**

Club funds at the moment stand at \$280.00.

A. CUTTS, Treasurer

SOCIAL SECRETARY'S REPORT

The time laid down for payments of dinner tickets has now passed and at the next club meeting all those tickets that have outstanding money on them will be sold, first come, first served. All members who have ordered tickets and paid a deposit have been informed of the conditions of purchase in the last three or four newsletters, and have been advised verbally over the phone on numerous occasions.

It is regretted that we have to do this, but we do not want another schmozzle similar to the 1967 dinner. If you are genuine in wanting to go, give me a ring on 232-3087, state your case, and we will see about reserving your tickets.

REMEMBER! All tickets that have not had the final payment paid on them by 21-11-69 will be sold on that night at the club meeting.

L. J. ADDISON -

Soc. Secretary.

PAST MEETING, 17.10.69

At this meeting there was much discussion on the badges and scrolls to be presented to the life members at the annual club dinner. The scrolls were, if possible, to be on a parchment type artridge with the Group emblem ghosted thereon, and then suitably ordered. The badges were to be in 9 carat gold, and, subject to suitability and taste, the words 'Life Member' attached by small plates to the base of the badge. These ideas are, of course, subject to cost.

It was decided to increase the membership fee \$1.00 to \$6.00 and to give all new members on entry a club badge and a club ceremonial flag, this is in addition to the hand-book which all new members receive now.

A car transfer is to be investigated similar in style to the car badge with the addition of a telephone number. It is felt that this could be a cheap form of mass advertising as the transfers could be placed not only on members' cars but sympathetic friends and parents.

Places to dive at for the coming year were submitted and the diving committee will look at these and prepare the 1970 outings list.

Election of office bearers within the committee took place and as can be seen on page 3 this is the line up for the coming year. This is subject to J. Noonan accepting the position of Secretary as he was absent from this meeting swimming around Queensland on his honeymoon. Non-committee man Ron Addison was asked if he would mind carrying on with "Fathoms", and the president thanked him for accepting and also for the previous twelve month's work.

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DR SALE - 72 cubic ft. Lung, in tent and good order. \$95.00
Contact Max Henshall, 579-1716

CONGRATULATIONS to Frank Coustloy, one of our Vice Presidents, and his wife, Faye, on the arrival of his first child, a daughter. Both mother and daughter doing fine.

FUTURE OUTINGS TO END OF YEAR

November 30th - Walhalla (Gold dive)
December 6th - Club Dinner

All persons wishing to go on club dives (do not have to be members of Victorian Sub-Aqua Group) are quite welcome. As we rely quite heavily on private members' boats for boat trips, it is advisable to contact one of the club committeemen beforehand to make your wishes knoww.

ANYONE FOR TREASURE

In the "Herald" on Saturday 11th October, 1969, there was a report about lost and forgotten treasures and the amounts that were mentioned were enough to make even the most stubborn stay-at-home want to get out and start searching.

The one with the most attraction behind it was Benito Benito's treasure, "The Loot of Lima", reputedly worth \$60,000,000. Legend has it that the pirate sailed in through the Rip sometime during 1814 and anchored off Point Lonsdale, whereupon he unloaded all this 'booty' into the ship's longboat and rowed across to Queenscliff to bury it.

Bonito Bonito was an ex-British Navy Officer in command of his own ship, "The Devonshire". During this time he went by the name of 'Graham' and when he made the decision to turn pirate, he changed his name. He asked his crew if they wanted to join him and those who didn't were put ashore at Panama.

Confusion reigns as to how Bonito Bonito managed to get his hands on the treasure as this had been loaded onto a vessel named "Mary Dier" during the war between Chile and Peru.

When Bonito Bonito sailed in through the Rip it is quite possible that the ship he now had was the Spanish galleon, "Relampago", his

own "Devonshire" having been severely damaged when he raided and captured a fleet of Spaniards.

While he was burying the treasure he was disturbed by a British Man of War that had been commissioned to hunt him down and, we rely heavily on legend again, he blew up the cliff face to hide the cave where he had hidden the booty.

He then headed out to sea where he was kept from escaping by the man of war keeping to the sea-ward side of him. Somewhere between Point Nepean and Wilson's Prom. he was sunk by gunfire and all his crew taken prisoner. It could be that the treasure is still in his ship somewhere on the seabed.

Scores of syndicates and individuals have hunted for the treasure but no one has found even a small of it. However, while there is a chance that the story is true, and while you get men with an adventuresome frame of mine, someone is going to keep searching until all hope fades out.

Further information can be gained about Bonito Bonito from "Lost Treasures in Australia and New Zealand" by K.W. Byron, published by Ure Smith, Sydney.

It is suggested that the Club purchase this book for the library.

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WHAT'S UP DOWN - UNDER ?

In the United States a Presidential Commission has called for the establishment of manned bases on the ocean floor at depths of up to four miles within the next ten years.

A New South Wales diver, Enid Gorton, was bitten by a blue ringed octopus after she found an interesting shell and stuffed it into her wet suit.

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