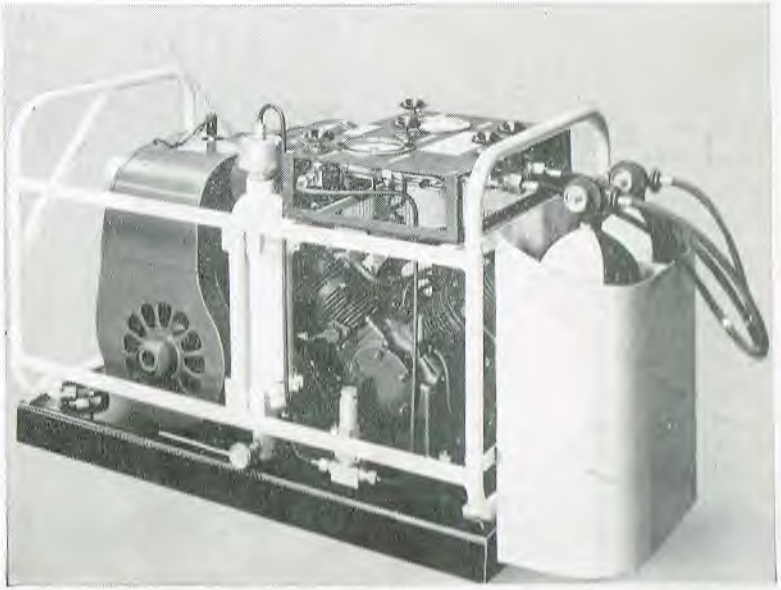

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filter and control panel is mounted in a tubular steel carrying frame and weighs approximately 400 lb. It can be used independently or incorporated in a static installation.

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ROYAL NAVAL

DIVING MAGAZINE

Marineland—*see page 9*

Vol. 11 No. 1 H.M.S. VERNON 2/-

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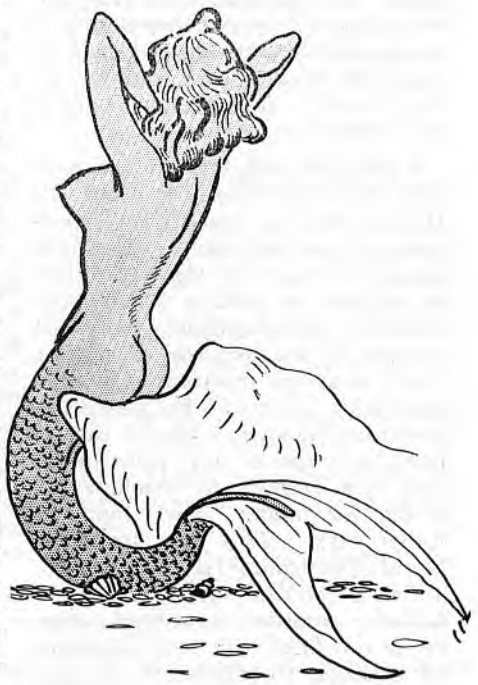
Vol. 11 Spring 1964 No. 1

Editorial



ONCE again we start off with the introduction of a new staff. Lt. E. W. J. Smith, R.N. will shortly be leaving for the sun-soaked Far East station, while Sub-Lt. P. R. Park, R.N. takes over as Treasurer and Secretary. Our last Editor, P.O. Lloyd, has taken over Coxswain's duties on-board a Coastal Minesweeper, somewhere in the West country. We hope to retain the valuable services of P.O. Brassington, our cartoonist, who is joining H.M.S. *Eagle* in the near future. Mr. Roy Fordham continues to give us his assistance for which we are more than grateful.

It has been said that we have had this cover design too long, so let's have your ideas and sketches as soon as possible.

May I point out that this magazine is non-profit making so to pay for publishing, etc., ships are requested to clear up any outstanding debits, also to send in cash as soon as possible after receiving your copies, unsold magazines please return, but we prefer cash.

It seems almost a regular theme for Editorials to include a plea for material, and since taking over as Editor I can see why. It is a constant struggle to get articles and to get people to write them, so please help by sending us items of interest, this magazine can only be as good as YOU make it.

V.G.

Letters to the Editor

Dear Editor,

I am the recipient of your R.N. DIVING MAGAZINE which receives my compliments for its presentations of diving information in a straightforward unembellished manner.

At the present time I am stationed on the sub tender *Nereus* (AS-17) in San Diego and the majority of our diving is relegated to hull repair, screw changes, and other semi-routine diving which has little, if any, interest to divers in other fields. I spent the recent years in Keyport Washington in the Northwestern U.S. diving on the torpedo test station, and some of our work bordered on the unusual. (See article TORPEDO RECOVERY).

I was quite interested in the portable bell and chamber used by H.M.S. *Reclaim*. A bell of this type is practicle and may keep others from going the route of Hannes Keller. In regards to Keller's article published in your Magazine Volume10/1 I have a few remarks to make. Firstly in several instances he ignored the advice of a U.S.N. safety observer on the scene. Small's case of bends a couple of days prior to the dive was enough to preclude his diving no matter how slight as Keller says. Two men from the Naval Electronics Laboratory here in San Diego were on the scene, and Keller's recorded testimony after the dive is filled with contradictions. He attempts to rationalize his mistakes by saying his methods were O.K.?? This is not meant to be sour grapes as his dive required a lot of guts and his work has added to our knowledge of diving, but for him to say that Small didn't die from bends is to not factng facts. Keller's insistance on keeping his 'secret formula' until the Navy paid him highly for it is an indicator of the commercial rather than the scientific attitude which guided him. One more inconsistency in his story — he did not run out of his gas mixture! The findings after the dive did show a small leak, but he still had plenty of gas. We have known for years that by using Helium or Hydrogen for the inert gas that the narcotic effect can be lessened, but not discounted, and that by keeping the O_2 partial pressure as high as possible the decompression time can be shortened. Why can't he simply admit that he is using the same principle in a more refined way be shifting mixtures several times? He also claims by some mysterious means to have discovered that CO_2 and not N_2 is the 'bugaboo' in narcosis — I would like him to witness a shift from a HE/O_2 mixture at 300 ft. to N_2/O_2 mixture using the same CO_2 content. It is almost like being hit with a sledgehammer.

One more small item on Keller. He is apparently one of the unusual individuals with tissues of high circulatory values and information on his tolerance to bends on any certain gas mixture would almost certainly not apply to the ordinary diver. This could very well apply to O_2 toxicity as well.

BOB SHEATS, T.M.C.M.,
Master Diver, U.S.N.

In regard to the letter sent in by Bob Sheats about Hannes Keller. It may interest people to know in the report published by the facts finding committee in Los Angeles, it states:

All testimony agrees to the fact that Hannes Keller was unconscious for one half hour and Peter Small remained unconscious for 2 hours. The decompression schedule used for both Keller and Small was much more rapid than would have been acceptable under standard Navy decompression procedures as practised in this country (U.S.A.) and which is essentially uniformally the same throughout the Navies of the world.

According to the autopsy, with the exception of serious gas embolism, Peter Small's condition was physically sound. In particular, there was no evidence of coronary occlusions or cardiac diseases.

The committee is in agreement, with the conclusion by Dr. Buhlmann "that Peter Small's circulation was seriously impaired through possible prolonged anoxia with loss of consciousness". Therefore, he was not able to eliminate adequately the nitrogen from his body and so developed the symptoms of decompression illness — bends dying in consequence.

Of Christopher Whittaker the report continues in their opinion Whittaker was over weighted, and had to resort to inflating his life vest to make the surface from his first dive. Not having this flotation aid on his second dive, having slashed it with his knife, the exertion to regain the surface is believed to have caused anoxia resulting in unconsciousness during which time the weight of his equipment carried him to an unrecoverable depth. Editor.

Dear Editor,

In publishing this letter I am hoping that you will be the medium of my renewing old aquaintances.

During my service as a diver, I experienced a way of life which doesn't exist anywhere else. As I think back to those days, suddenly a name comes to mind, and there are so many of them. To name a few, Jack Diamond, P.O. Walton, Lofty Asbury, Lofty Yates, Bill Torny, Sham Tuck, Tubby Hirst, hell!, I could go on for ever.

Perhaps some of my old friends are subscribers to your magazine and may drop me a line. Who knows we might even arrange to meet, Bletchley is pretty central.

Good Luck and a Happy New Year to you and all your members.

Sincerely
ALAN JONES,
49 Avon Grove,
Bletchley, Bucks.

Alex Copeland writes from South Australia; "I have been out here for six years now, serving in the Police Force". He very kindly offers readers any information about the country, etc., and says "Just write"; his address is;

Box 101, G.P.O. Mount Barker,
South Australia.

Les Killon is also asking the whereabouts of old shipmates, his address is;

114, St. Stephens Road,
Bow LONDON E.3

The officer of the watch coming on deck to do his evening rounds saw a naval rating lying on the deck; 'He's drunk' he exclaimed to the quartermaster. 'Never Sir' was the reply 'I just saw his finger move.

* * * *

Wealthy people miss one of the greatest thrills in life . . . 'paying the last installment.'

The school class had been given an essay to write, title 'Winter'. One childs attempt read as follows:—

'In winter — it is very cold and many people die in winter, many birds also go to warmer places.

* * * *

A pat on the back developes character . . . if administered young enough and low enough.

Marineland

DURING the past few years more and more members of the general public have become conscious, through television, cinema and accounts of the adventures of Hass, Keller, Cousteau, etc., of the world beneath the sea, and have discovered for themselves the 'thrills' of killing the denizens of the deep for 'sport'.

It is refreshing to learn however, of a further step forward now being taken to preserve and observe these same underwater creatures and present them for show to the public at large, in an environment as close to nature as possible, so that we may increase our specific and general knowledge. It is even more refreshing to learn that ex-Royal Naval divers are playing their part in this attempt to preserve, present and increase our knowledge of sea creatures.

Recently, in Manly, a surburb of Sydney, New South Wales known as the 'Playground of the Pacific', Australia's first 'Oceanarium' was opened to the public. 'Marineland', as it is called, is the seventh oceanarium in the world, the others being at Port Elizabeth and Durban in South Africa, Japan, and one in Los Angeles and two in Florida, U.S.A. The Manly oceanarium is the third biggest in the world and the largest in the Southern Hemisphere. When

Surrounded by dozens of friendly fish Peter (Lofty) Richardson, the diver for Marineland Oceanarium, arrives at the bottom of the tank to feed the fish during one of his five daily feeding dives.

fully stocked it will contain about 2,000 fish of more than 150 different species.

The project was developed with the aim of showing to the public the species of fish that live around the Australian coastline and to afford facilities for observation of the underwater creatures and their habits by research workers and students. Trying at the same time to expand the rather meagre knowledge that we have of life under the sea.

The tank itself is 55 feet in diameter and about 18 feet deep and holds 250,000 gallons of sea water. The water is drawn from the sea, filtered and continuously circulated through the tank. The temperature remains at approximately the same level as that of the surrounding sea water. The fish can be observed and studied from two enclosed corridors round the tank as well as from the surface. There are approximately 70 large viewing ports in the corridors set about 5 feet and 12 feet below the surface. The corridors are air conditioned for comfort and to prevent condensation which would impair the vision through the ports.

The Director and administrator of Marineland is Doctor J. Thomson, D.Sc. whose job is to see to the smooth everyday running of the oceanarium and to care for the inhabitants. He is also responsible for carrying out the research that this facility provides. To assist him in his task of caring for the many species of fish, which include various types of shark, kingfish, turtle, sting ray and dozens of coral and reef fish and other exotic specimens, he has two ex-Royal Naval personnel who I'm sure will be remembered by many. I know of some past members of the Med. Team, and of Guzz, Londonderry and some *Reclaimites* who will remember Peter (Lofty) Richardson. Many submariners too will remember Norman (Norm) Bickley from Manchester, especially those who were in the 4th Submarine Division here in Sydney some time ago.

These two have been selected from many applicants for the job of feeding the fish in the tank five to seven times a day with some 40lbs. of food consisting of chopped fish, squid, crayfish, shrimps, mussels and conjevoi. They are responsible for seeing that each species of fish gets the type of food most suited to it. This includes the hand feeding of sharks and turtles, all done underwater. In addition they make sure that the inhabitants of the tank are healthy and this includes 'walking' newly arrived and introduced sharks round the pool until they are accustomed to the confines of the tank and are able to get a sufficient flow of water through their gills to live.

One of the jobs is 'Walking' newly arrived sharks round the oceanarium. Here ho is 'walking' a newly arrived and beautifully marked Wobbegong (or Carpet Shark) round the tank.

The two divers are also regularly seen 'exercising' the turtles and occasionally scrubbing their backs to remove the sea growth!

During their time in the tank, Lofty and Norm have to keep a watchful eye on the sharks in the pool. There are a number of Whaler sharks of various types as well as Grey Nurse, Wibblegong or carpet shark and the peculiar species of common shark called the Port Jackson Shark which was first seen in, and inhabits, Port Jackson which in broad terms is Sydney Harbour itself.

The population of the oceanarium is continually being added to as some species do not adapt themselves to pool life as do some of the slower moving fish. This means that the divers are called on to catch specimens in the seas off New South Wales coast line, which abounds with fish, despite the actions of the fishermen. Specimens of all shapes, sizes and species are caught by netting, trapping, rod and line in fact any method that does not harm the fish too much. The catch is then transported to the oceanarium by large tanks either in a boat or on a lorry for introduction to the pool at night. The new arrivals are introduced at night so that they may have some time to settle down whilst the pool is relatively quite and before the day's activity begins.

Both Lofty and Norm love their job and the sight of them swimming in the tank with schools of fish surrounding them at feeding times is ample proof that the fish know that they have this weird creature of Homo Sapiens as their friend and protector. This makes them about 10,000 times better off than their relatives outside.

EDITORS NOTE:

Lofty and Norm would welcome any news from friends around the world. If in Sydney go along and see them at Manly on the North side of Sydney Harbour. Letters can be address to c/o Marineland Pty. Ltd., P.O. Box 136 Manly, N.S.W., Australia.

COVER—Peter (Lofty) Richardson 'exercising' a giant turtle at Marineland, Manly, New South Wales. Occasionally he has the job of scrubbing its back too!

Deepwater Torpedo Recovery

A method of recovery of torpedo's has been devised by a couple of enterprising fishermen in conjunction with some U.S. Navy equipment and ideas. (See sketch on technique used.)

First of all, the unit must be equipped with a battery powered 'pinger' device which is about 12 inches in length by 4 inches diameter.

This unit puts out a super-sonic impulse at a rate of about 20 per minute and continues for a period of three weeks or more. An Ordnance Receiver Transducer Apparatus is used to receive the frequency impulses put out by the 'pinger'. The range of this equipment is surprisingly good and it isn't unusual to receive the sound at a distance of 500 yards.

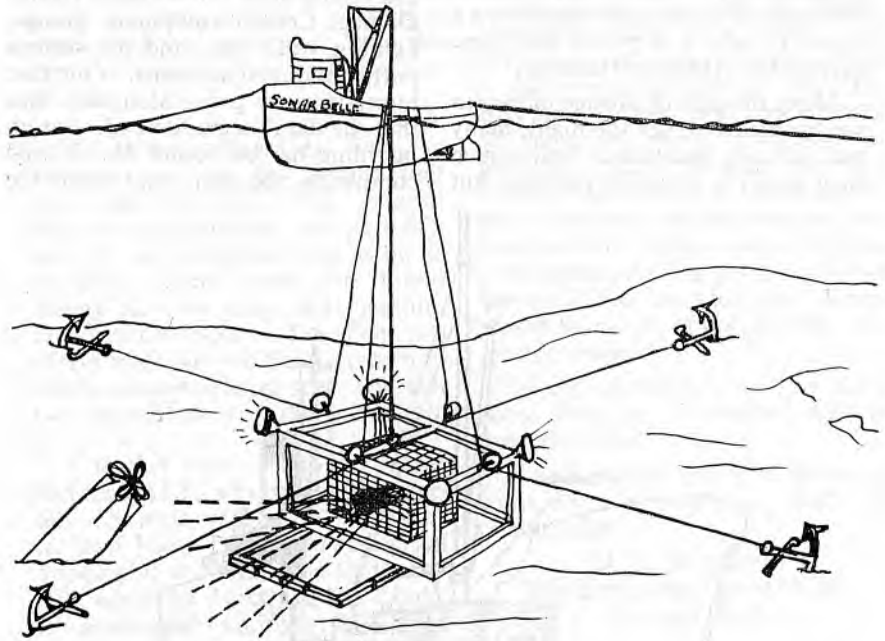
A specially equipped search boat pinpoints and buoys the location, after which a 3 or 4 point moor is laid for the recovery vessel. After the vessel is positioned, four small Kedge anchors are laid out for the camera cage control. Wire from these is run through blocks on the camera cage, and you can see by the

drawing how the T.V. camera travels in any desired direction by taking in one wire and slackening on the one opposite.

Four hydrophones are placed on the corners of the cage and with selector switches in use the strongest impulse indicates which direction the lost unit is in. When the unit is sighted it is a comparatively simple operation to rig an aluminium angle extension with a wire loop to lasso and heave the unit close to the surface where divers can descend to fasten the regular recovery gear.

Up till a short while ago 150 units had been recovered at varying depths. In shallow water we had great success with a S.C.U.B.A. diver carrying a hand-held transducer with the 'ping' sound relayed back down to him through a standard diving telephone via a small transceiver carried under his wet suit hood.

By prearranged signal he could also talk back to topside, when necessary, to enable a recovery line to be sent down to him, using the cable as a work line.



I stood up for you Knobby, Chief said you were not fit to live with pigs; I said you were.

* * * *

Running after women never hurts anybody . . . it's catching them that does the damage.

O tall was she poised and cool, with skin like flawless silk,
Eyes not born to rue but rule a throat as white as milk,
In crowded bus her eyes shone warm, her eyebrows rose a trifle;
And then her perfect lips did form . . .
'A've yer had yer flippin eye full',

Operation Nordenfelt

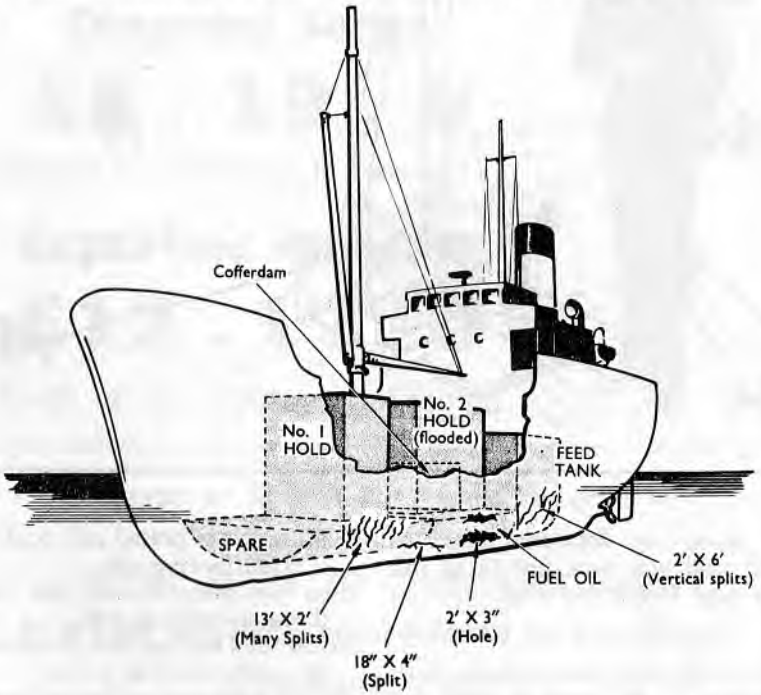
IT is not very often that a ships' diving team get the opportunity to do positive work, on a vessel that has gone aground and sustained severe damage. But the chance came to Undaunted's team on on January 14th 1964.

Entering harbour on the night of 13th January, after a long day exercising at Portland, we had just come to anchor and made ready to keep a night vigil as duty Destroyer, hoping that it would be completed in name only. It lasted four minutes. We were off to sea again answering a signal to help a ship that had gone aground in Alderney Harbour.

Many thought of salvage money as we steamed through the night, many had already calculated how much they would be receiving per ton. But it was not to be, the vessel was the Naval Armament Ship *Nordenfelt*.

We arrived in the early hours of the morning, and proceeded into harbour at 0700, by this time *Nordenfelt* had freed herself from her captors and had managed to limp alongside the jetty. She reported heavy flooding and thought that she had been holed pretty severely.

As soon as we had anchored, the diving team embarked in the motor boat, which seemed to be loaded with everything save the Captain's sink; Damage Control equipment, pumps, lighting, radio sets, and the various parties required to assist. Our first impression on going alongside, was that she didn't seem too bad. But on boarding her we found No. 2 hold completely flooded, and that the starboard ballast tanks had been flooded to counteract a list to port.



N.A.V. NORDENFELT, showing position of damage found by Undaunted's diving team

The divers made ready; their first job was to clear No. 2 hold of floating boxes which contained ammunition. We were also told that a considerable quantity of ammunition was still on board. This job completed, two divers went over to locate the damage concentrating on the port side. Conditions were not very good, it was decided to dive from the *Nordenfelt*, because of the heavy swell that was running and the occasional violent movement of the ship. The water was very cold and a thick film of oil stuck to the surface. Visibility underneath was quite good, and the depth of water for the first dive was 30 feet.

The diver's started to find the damage, and the first report that came up was that of an amazed diver trying to indicate the length of a split, by stretching his arms as far as possible. Three holes were found during the first dive, and measurements were taken. The first two divers came out and had to return to *Undaunted* to recharge sets. The next two carried on with the inspection.

A further hole was found in the fuel tank which was belching out fuel oil. The next was the one suspected to have been the main cause of flooding, it was aft, in the feed water tank which led directly to No. 2 hold. It was thought that if we could block this one up, it would give the pumps (the majority of which had broken down by this time) a chance to combat the water. We tried to put a diver inside No. 2 hold first, but the pressure entering through the hole was too great for him to stop it up. He then dived outboard again and managed to get two wedges in the hole, before things got a bit dangerous.

In Alderney Harbour the rise and fall of the tide is approximately 30 feet. We happened to get there on the ebb, and by noon the depth had dropped to 15 feet giving us a clearance of 2 feet under the keel and with the ship heaving about it was decided to abandon diving operation until 1400.

The divers returned to *Undaunted* to change and get warm again, but not much rest, and two were required to search for the motor boats rudder which had been lost overboard, but due to the swinging of the ship this was not found.

The divers returned on board *Nordenfelt* just after 1400, and started to make temporary repairs. It still wasn't possible to plug the after split, so work was concentrated on the other holes. Eventually at 1450 the clearing beneath the keel enabled two divers to plug up the after split with wooden wedges, and then assist the sailors on deck to place a pad piece, consisting of a shock mat sewn in P.V.C. over the split. It was passed by means of bottom lines and secured inboard.

Diving operations had to cease soon after, as *Undaunted* had to proceed to sea.

A task carried out with plenty of spirit, for which the divers are to be commended.

(D. A. BARTLETT),
Sub-Lieutenant, Royal Navy
Diving Officer

Undaunted's' Diving Team:

A./Leading Seaman Green,
L.T.O. Temperley,
P.O.M.(E) Golds,
Able Seaman Charlton,
Ordinary Seaman Heatley (Attendant),
Leading Seaman Cook (*Vernon* Class), who volunteered his services.

Diving in the Royal Australian Navy

THE reason you have not heard from this neck of the woods for so long is that we have been so swamped with 'bumf' that most people have had to keep DIVING MAGAZINE article at the bottom of our things to do list. All this 'bumf' is now producing effects, both good and bad, so the following will describe what we've done, what we hope to do and how we do it.

Present C.D. Structure:—

About four years ago it was found that the small C.D. Branch was losing members. This was because more people were paying off and being advanced than were being trained as C.D.3's, the system of recruiting and training being similar to the R.N. The volunteers were around, but the other branches could not (or would not) release them for Clearance Diving.

So a new system of training was introduced. Ratings were selected by a C.D. Officer at Recruit School and commenced C.D. course before going to sea for Ordinary Seaman Training. This course merely turned them into Compressed Air (R.N. equivalent — Free) Divers who had been introduced to C.D. equipment, and who, in the opinion of the Instructor, stood a good chance of becoming a useful C.D.

This was called a C.D.3 course and ratings already qualified to R.N. standards were up-graded one step, C.D.1's becoming Instructor Clearance Divers. Thus the training ladder became:—

C.D.3 course—10 weeks
C.D.2 course—18 weeks
C.D.1 course—11 weeks
I.C.D. course—10 weeks

With this scheme, C.D'2's were the most junior ratings to be employed in teams and units, with C.D.3's all going to Ship's Diving teams. So, if you meet any of our ships, please don't expect a C.D.3 to be a C.D.* — he's not — he's a man the other branches can't grab and that's all.

Proposed Rating Structure:—

This scheme was not as successful as was hoped. The Change over (now completed) was not very smoothly executed, we ran out of working hands, and it looked as if teams and units would have nothing but L./Seamen and above. Also, how many recruits know what they want ?

Luckily, we may have been saved by the R.A.N.s decision to rationalise all rating training. It was felt that some ratings learn too much (e.g., R.P's will now not have to do much seamanship) and that too much time was spent ashore on course. The proposals could well have been produced to pull us out of our dilemma. The new system will still allow us to select people at Recruit School but they will only do a four week course to see if they are suitable (we found that 95% of the people who failed C.D.3 course failed during the first four weeks).

Thus the new system goes like this:—

Ord. C. D. — 4 weeks course.
A.B. C.D. — 22 weeks course.
L.S. C.D. — no course — Fleet Board in —
(*a*) Power of Command
(*b*) Clearance Diving.
P.O. C.D. — 16 weeks course.
C.P.O. C.D. — no course — Fleet Board as for L.S. C.D.

It is felt that the total time on course, while less than the R.N. is sufficient, as it cuts out duplication and we don't have sufficient equipment to teach all that is taught in the R.N. It is hoped that this will over-

come the short comings of the present scheme.

General:—

So much for the 'what we've done' section. Now for 'how we do it'. Generally speaking we use the same gear as the R.N., the only problem being the line of supply is a little longer than Portsmouth to *Vernon* and communication a little more difficult than telephoning. Nevertheless, U.B.A. is what we like and use, with the addition of C.A.B.A. and S.S.B.A. of local manufacture. The beauty of this latter equipment is the lack of maintenance required and its ruggedness. Those who know our S.S.B.A. (HOOKAH) will be pleased to know that we now have under trial a new motor, vastly superior in every respect. Also, we are about to receive Cousteau Constant Volume Suits, to push our limit a bit further, but not quite to 1,200 feet.

Situation:—

At the moment we have 36 C.D.2's and above and 37 C.D.3's With these we run the following:—

School:—

Situated at H.M.A.S. *Rushcutter*, Sydney Harbour, and has the following facilities:—

(*a*) No permanent classrooms.
(*b*) Three Offices.
(*c*) No accommodation. (Personnel live at H.M.A.S. *Watson* — 5 miles distant).
(*d*) Diving Boat *Seal* — 66 feet trawler.
(*e*) Diving Boat *Otter* — 55 feet trawler.
(*f*) Diving Boat *Walrus* — similar to 75 feet M.F.V.
(*g*) Diving Boat — one workboat (i.e., 50 feet general purpose boat).
(*h*) Use of three wharves.
(*i*) One R.C.C. (Saunders Roe).
(*j*) One Zodiac.

With this we try to train up to four C.D. classes (generally two to three) and one 'Diver' (i.e. Compressed Air Diver) class continuously.

The next four organisations are also situated in H.M.A.S. *Rushcutter* and work under the same person.

Port Diving Party:—

Do general harbour work — docking ships, laying, recovering and surveying moorings, recovery of stores and anything else that crops up. This party also:—

(*a*) Run the Naval Store.
(*b*) Maintain all stores, e.g. sub-smash stores, compressed air tools, etc.
(*c*) Maintain *Rushcutter* (Diving) generally.

School of Under Medicine:—

Consists of Surgeon Lt.-Cdr. Gray, one S.B.A. and three rooms, and has been in being for three months. It shows great promise as a real aid to diving practice.

Bomb and Mine Disposals:—

Consists of I.C.D. and a C.D.2 in two huts at H.M.A.S. *Watson*. Dreadfully lacking in equipment, but is steadily improving. Bomb Disposal instruction is given by the I.C.D. at the Army's School of Military Engineering some 30 miles from Sydney. When someone is required to sign for stores, the Assistant Training Officer steps forward.

Under Research and Development Unit. (U.R.D.U.):—

Try anything from local diving appliances and equipment to items produced from the R.A.N's Experimental Laboratory. Interesting rewarding work and good fun. Some of their trails have shown promising results.

Mobile Clearance Diving Team (M.C.D.T.):—

Live in 110 feet M.F.V. converted for Diving and satisfactory in that role. Situated with the 16th M.S. Squadron, and controlled by the Commander Mine Countermeasures. Get all jobs away from the Sydney area and enjoy themselves immensely. A much sought after draft.

On reading back through this I begin to feel depressed again. However things are not as bad as they may seem, the weather and diving conditions are generally good, the sharks are not as hungry as generally imagined in U.K. and, as in every other Navy, the qualified Clearance Divers are the cream of the crop. Also, recent proposals involving millions of pounds appear to be favourably considered.

Finally, all the best to all the C.D.1 /C.D.O. class, 1/59, I wouldn't mind still being on it.

Yours aye, 'LIMPETS'.

P.S. — More will follow — by a more gifted author I hope.

Divers' Lament

I'M sitting thinking of the days which I have left behind,
So now I'll put on paper what's running through my mind,
Many a sailor thinks a divers life is swell,
But let me tell you Jack a divers life is Hell.

I've swum a million jackstays, lifted a million shots,
I've caught my whack of lobsters, and left alone the pots,
I've changed screws cleared screws, and shifted many a dome,
I've found things lost things, working fingers to the bone.

Of Horsea Island I can tell and this is true me 'mate,
A meaner place this side of hell I bet you that there ain't,
But we divers have our consolations which I'm bound to tell,
When we die we go to heaven 'cos we've had our share of hell.

But when the final pipe is sounded, I'll lay aside my cares,
And take me last nights leave right up those golden stairs,
Tis then the saints will welcome me and they will loudly hail,
'Take your rest in heaven Deeps you've had your share of Hell.'

V.G.

Tales from 'Tartar'

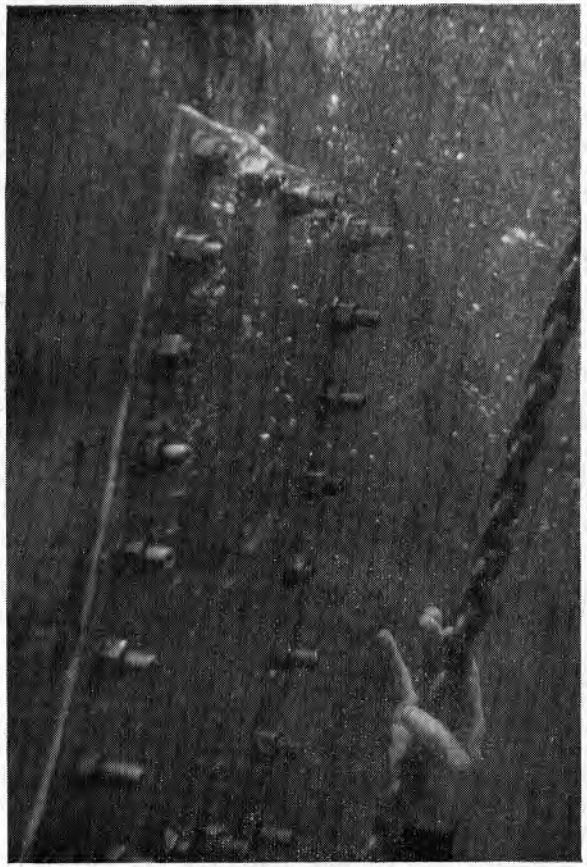
TARTAR'S appearance on the West Indies station was slightly unexpected. We left U.K. at the beginning of August to take part in a N.A.T.O. exercise and then to go on to the Mediterranean with the West Indies as our final destination early in 1964. However, half-way through this exercise our programme was changed and we came straight out to the West Indies and here we stay for our year away. Since we've been out here we have spent quite a lot of time on patrol in the Southern Bahamas, in an effort to prevent various forms of undesirable Cubans taking swipes at each other, or other such ungentlemanly pastimes, on British territory.

For the whole of October we were hurricane guardship, and were immediately employed in rendering aid to Tobago after the havoc caused there by Hurricane 'Flora'. We spent a week at Tobago and it was quite an experience to see the state on an

island so recently hit by a severe hurricane.

From Tobago we visited Trinidad, Carriacou, St. Kitts and Barbados. We returned to Bermuda for 14 days maintenance and, once again, we are on the Bahamas Patrol.

Apart from normal routine type diving jobs and Craw fish chasing round the coral reefs, we have had one or two more interesting tasks which are worthy of brief mention. The first came about early September when the ship was coming to anchor, and in the process managed to poke a 3 inch slit in the ships side, below the waterline, with her anchor. The damage was temporarily repaired with a cement box from the inside, however, this was an ideal excuse for the divers to get out the Cox's Gun and do a proper job. Everything was taken smoothly and steadily, handbooks consulted, patch measured and plate prepared, and down we went and I took the honour of firing the



first 'locating' bolt. Measurements had to be carefully taken as the split occurred on a frame and the bolts had to be fired so that they were clear of it.

A firm thrust, a sharp crack, the first bolt fired and when the gun was removed from the ship's side — lo and behold a neat round hole straight through the plating! P.O. Roberts was left down there doing the classics 'Dutchman's act' whilst I returned to the surface and made provision for a conventional bolt to be pushed through from inside the ship. The plate was hung on this and, as we were already using the weakest bolt charge available, it was with some fear and trepidation that the next bolt was fired. However, all was well and the remaining 20 bolts fired without further incident, nuts tightened up, and the job satisfactorily completed. For those that may be confronted by a similar task a few hints might not be amiss:—

There appears to be no written guidance on the spacing of the bolt holes in the patch plate. We used a spacing of 3 inch which seems to be satisfactory, the plate being 3/16 inch thick, the rubber insertion $\frac{1}{4}$ inch thick, and the plate having to take up a slight inward curve to fit the ships side. The expected stand of $2\frac{1}{2}$ inch for the fired bolt was not so, all the bolts that we fired stood proud only between $1\frac{1}{4}$ inch to $1\frac{3}{4}$ inch. One possible cause for this might be the higher cordite temparature of the bolt ammunition in this part of the world.

Our next out of the ordinary job was at Tabago, where half the team armed with the ships whaler full of diving equipment went ashore for two days whilst the ship went down to British Guiana to collect tents for the Tobagan homeless. The job this time involved replacing two large shackles in the two buoy moorings used by the monthly tanker that calls at the island. Also, turning end for a 60 feet length of flexible underwater pipeline through which the tanker discharges its oil to the shore storage tanks. It was most important that this job should be completed so that the island would not be deprived of one of its most vital commodities. However, it had civilian complications in that the oil company concerned had contracted their own diver and divers mate from Trinidad to do the job. This stalwart of the underwater world arrived over with little equipment and no diving boat, expected to have a free hand in the use of our gear and in the process was earning about £70 per day on account of our goodwill. This sort of situation is enough to make any self respecting Naval Diver squirm with disgust, however, the matter was ironed out reasonably well and the task just completed in the two days available to us.

The next job brought us back to work under the ship again. The engineers found they were unable to close the Main Circulation Outlet Valve. Inspection by divers was carried out but failed to throw any further light on the matter. The next phase was to make a stout wooden raft of 2 inch thick planks of a size 4 feet × 3 feet, Secured to it on one side was an oakum stuffed canvas hose laid in a circle of greater diameter than the outlet hole. Two lines were passed under the ship and secured to the two wire guys on one side of the raft, and the whole contraption was then keel-hauled and manoevered by divers so that the canvas hose surrounded the outlet hole and the raft acted as a blank. The engineers were thus able to drain the water in the trunk away into the bilges, sea water pressure causing the raft to come hard up on the ships bottom and effecting a good seal. The valve box was then opened up for inspection and the defect remedied.

Finally, whilst at Bermuda in November we were called upon to do a small underwater demolitions job. An obstruction some 30 feet off shore was hindering Bermuda Airways in parking their seaplane at its landing stage close to the civil air terminal building. Work began once we were in possession of a chit of paper signed by Bermuda Airways accepting full responsibility for any damage to property or personnel in the vicinity of the airport. The obstruction turned out to be an old sewage pipe some 18 inch in diameter sticking up at an angle out of the sea bed and it was destroyed after three blows of three 14 oz. charges in each. One big blow would have done just as well but in all probability the terminal building (only 70 yards away) would now be roofless.

No article from tropical climes is really complete without an underwater tale to surpass all others ever told, but we are going to disappoint you and warn you to view such tales with suspicion. To our disappointment no one has seen a shark whilst under water (most sharks out here are met on land, milking tourists) and only a few barracuda have been spotted and these, despite the evil leer on their faces, seem to keep their distance. Our own prey amongst the coral reefs are crawfish which, like their English Lobbie oppos, hang out in the deep crevices and shelves where the coral meets the seabed. They are as curious as the lobster, a little more active in their movements, not as tasty to eat. One terror of the deep to be constantly aware of, particularly when poking around coral crevises, is the Moray eel, and here we have been fortunate in not meeting any 'big-uns'. I personally have teased and tickled up a baby moray only about 15 inches long and was alarmed to see how it stood its ground and snapped its viscious little jaws at anything I cared to prod it with. His big brothers grow up to 9 feet long and must weight 80 to 100 lbs. — none of us have the slightest desire to meet 'Big Brother'.

Out here, in the West Indies, divers apply the 70/70 rule — that is to say, if the visibility and temperarture fall below these figures the tendency is to scrub round diving and head for the nearest 'boozer'. No, seriously it is quite a revelation for those of us who have only dived in the U.K. up till now to come out to this part of the world where conditions are really excellent.

For those interested in facts and figures and keeping tabs on their fellow rogues, the ship's team consists of Lt.-Cdr. Lermitte (C.D.O.), Lt. Herman, R.M. (S.W.D.O.), A.B. Hodgins (C.D.*), P.O. Roberts, L.S. Falklner. M.(E) Dear, (F.D.'s) and C.O.A. Cornell, A.B. Tucker and M.(E) McCullock (S.W.D's.)

(D.P.R. LERMITTE).

Introduction of New Diving Rate

DUE to modern diving equipment now being used in the Royal Navy with the emphasis on the change-over from oxygen to compressed air breathing sets, the need has arisen for a structional change in the diving training programmes used in the R.N. The Shallow Water Divers (S.W.D.) and the Free Divers (F.D.) have had to be amalgamated; this means the introduction of the new diving rate namely Ship's Divers. Officers will be known as Ship's Diver Officers.

The present Free Divers will automatically become Ship's Diver, while

the Shallow Water Diver will do a two-week conversion at one of the various diving schools. Shallow Water Divers changing over to the new rate, check in accordance with A.F.O. 64/64.

The training for the new rate will consist of a four-week course at any of the main diving schools. On completion of the course, Ship's Divers will be qualified to use S.A.B.A. (Swimmers Air Breathing Apparatus) to a depth of 60 feet and S.D.D.E. (Surface Demand Diving Equipment) to a depth of 120 feet. They will have a thorough knowledge of ship's bottom searches, diving regulations, lifesaving, Diving mechanics physiology and illnesses, they will also have an elementary knowledge of ship's underwater fittings, Sonar dome and propeller changing.

The Ship's Divers badge will be the same motif of divers helmet, as on the F.D. and S.W.D. badge but without the letters under it.

Applications should be made in accordance with A.F.O. 68/64.

Sub-Aqua Clubs

DURING the past ten years underwater exploration as a science and a sport has become exceedingly popular in Great Britain. Proof of this can be seen in the increasing number of Sub-Aqua Clubs shooting up in our towns and cities. These Clubs are not restricted to our coast towns for there are many well supported Clubs far inland. There are in fact an increasing number of Service Clubs, the main Naval organization being the 'Naval Air Command Sub-Aqua Club' run from H.M.S. Ariel and having a number of branches, ashore and afloat.

I have found that you can usually place these Sub-Aqua divers in three categories. One is the explorer, this is the fellow who dons his camera at weekends and when not clicking away underwater, is to be found amongst the marine biology books in the local reference library. He is the ardent and dedicated sort, a great asset to any club.

The second is the spear fisher or hunter, these are the really keen sportsmen and women of the Clubs. Although the fishing areas around our coast do not compare with places like the Red Sea or Mediterranean much fun can be had in the various known fishing grounds, and many Clubs travel great distances to dive in these waters.

The third character is the 'collector', he is the fellow who always knows the current resale price of brass and copper and can always be relied upon to have an anchor of some shape or size lying around.

These three and their counterparts, (combined of course with the individuals and all rounders), are the basis of any Sub-Aqua Club. I have purposely left till last the devoted men and women who do the organising of these Clubs, they may be explorers, hunters or collectors but fundamentaly they have progressive diving at heart and without them these Clubs would not exist.

A word now on what a new member may expect on joining a Sub-Aqua Club.

Firstly a nominal fee will be charged and a list of rules given which must be obeyed. A fairly high standard of fitness is required for the series of tests you will have to undergo prior to using the Clubs equipment; for example to become a competant Snorkle diver there are four

tests, A, B, C & D group. 'A' consist of swimming (no fins) 100 yards, swimming 50 yards on back and then 50 yards wearing a 10 pound weight belt, after, five minutes floating on your back, treading water for one minute with hands above head, then to recover six objects from the deep end of the training pool.

In groups B and C — fins, face-masks and snorkle-tube play a part, so does artificial respiration and recovery of drowning person.

Group D is the open water test and includes swimming 500 yards, diving 20 feet, more rescue of injured diver drill and an oral examination. The pupil may then be rated Snorkle Diver. On various evenings of the week, if the Club boasts a club house, there will be lectures, film shows and other items of interest, if a club house is not in existence a member's own home or a Pub back room will probably be used.

Many excursions are planned to fishing areas and places of interest throughout the year, mainly at weekends. There are also opportunities for competitive sport, this usually being snorkle fishing; if your ambitions are as high as world competition even this is possible, for last year the B.S.A.C. entered a team of five for the World Spear-fishing Championship in Brazil. Unfortunately they only came eleventh out of 13 teams, but when you consider that their only previous experience was of British waters, and that they were competing against the cream of the World's spear fishermen, this was not a bad effort. In fact, Brazil was only a trial run for them, and they are making plans for a better placing in the 1965 championships, which will be held in Corsica.

If you are not looking for fame and glory and all you require is to gain friends who share a mutual interest in underwater activities, these are the Clubs to join, for they have a great deal to offer in this respect.

The Editor of this Magazine will furnish details and the address of the nearest branch to anyone who may wish to join. V.G.

Who Found the Ding Dong?

DURING a recent courtesy visit to Cork, the Diving Team of H.M.S. *Cavendish* were asked to recover a Ship's bell lost over the side from the *City of Waterford* berthed at Albert Quay. The value of the bell was put at £15, weight approximately 25 lbs.

The Captain, Commander D. W. Brown mustered his warriors and taking first dip he plunged into the murky depths. Visability was nil due to about 4 to 5 feet of mud, so after a futile attempt in fins, boots were the dress of the day.

The search lasted about 3½ hours, unfortunately their hard work went unrewarded, and the bell remained mud bound.

Ship's Team:—
Cdr. D. W. Brown, S.W.D.O.
S.-Lieut. Percival, S.W.D.O.
S.-Lieut. Litchfield, S.W.D.O.
P.O. E. L. Crook, F.D.
A.B. Hill, S.W.D.
M. (E) Hessleton, S.W.D.

FOOTNOTE:—Board of Trade Regulations do not allow a ship to proceed without a bell; it is required for fog signals, etc. The *City of Waterford* had to find a replacement before sailing.

Lessons of the 'Thresher' Search

THE loss in April last year of the United States nuclear Submarine *Thresher* seems, sadly, to be one of the happenings from which science profits at the expense of human tradegy. *Thresher* was the most modern of those hunter craft, designed to seek out enemy submarines and destroy them, and she was therefore an important factor in U.S. strategic thinking. For this reason her sudden and unexpected disappearance was alarming. Where was she and what happened to her ? these were paramount questions.

With typical thoroughness, the Americans set about finding out. The various steps in the process were the subject of a lecture given at a recent meeting of the Undersea Equipment Research Society by Dr. A. T. Maxwell of the U.S. Office of Naval Research, who was in control of the technical aspects of the search.

The first move was to assemble as many Naval and Oceanographic ships as possible around *Thresher*'s approximate position when last heard from by the surface vessels. This provided a focal point for a ten mile square search area south of Newfoundland and east of Cape Cod. The sea bottom was surveyed by means of precision depth soundings.

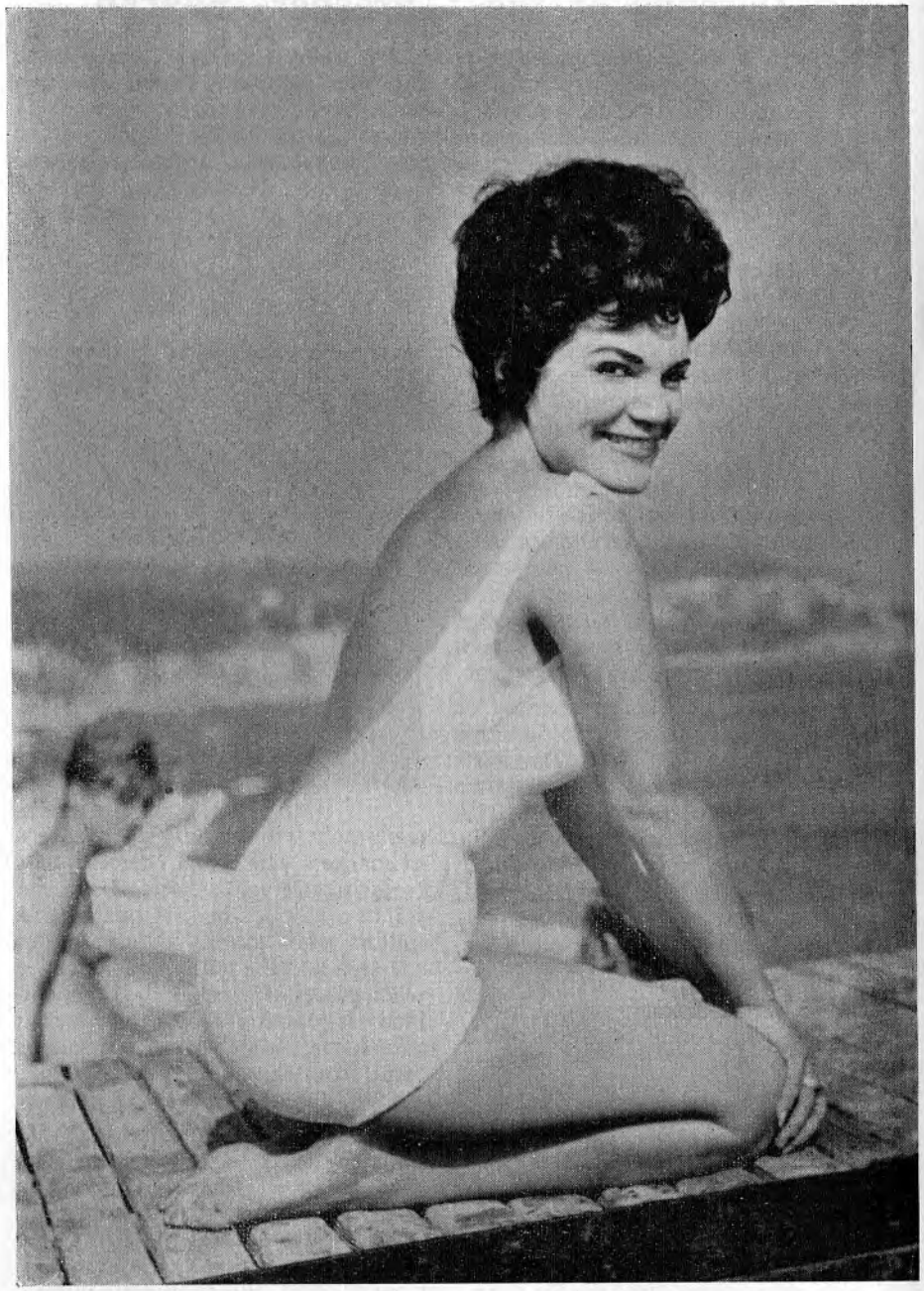
The underwater topography was found to be extremely rugged, which made positive indentification of the 'bump', which could be *Thresher*, very difficult. A way out was found by adapting a magnometer for deep water purposes, so that any large mass of metal could be distinguished from surrounding rocks by means of its own magnetic field. Such an indication was found and the surface vessel which carried the magnometer was able to dredge up 'O' rings of a kind used only aboard *Thresher* and one other craft.

The bathyscape Trieste then came into the picture. Diving for two hours she surveyed the most likely places for the resting place of the hull, during which time she passed over an area which was said to look like a junk yard. It was almost certainly debris from the ill-fated *Thresher*; and the bathyscape crew was able to 'fix' the position of this

accurately with the aid of a pattern of markers which had been dropped from a surface vessel at precise points on the sea-bed. A quarter of a million photographs were taken of the area and the matter was clinched when pieces of wreckage were indentified as coming from the nuclear submarine, some from inside and some from the conning tower.

Laboratory tests on model submarines suggest that although the hull may have burst, thus releasing some of the gear from inside, it should have remained in one piece. Nevertheless, it has not yet been found.

There are two reasons why this might be so. First the streamlined craft could have reached a speed of



Connie Francis, starring in M.G.M's 'Follow the Boys'.

Reproduced by permission of M.G.M. and *Bernard Bulletin.*

150 knots by the time she hit the bottom at something over 8,000 feet: second she is a very small object in relation to the search area and could easily have escaped the notice of the crew of the Trieste and the eye of the automatic cameras lowered from the surface vessels.

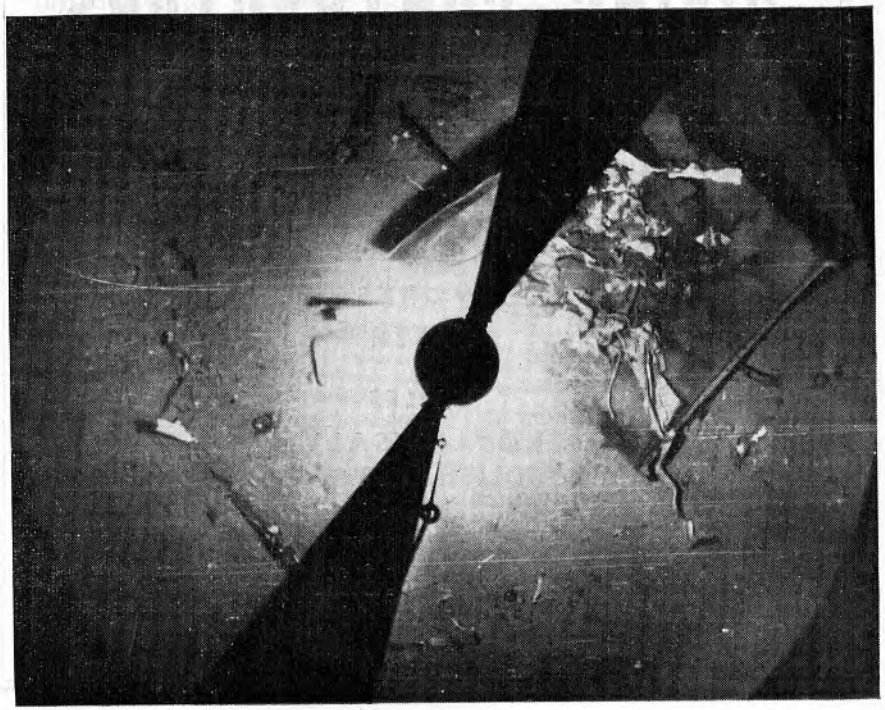
The search has now been halted for the winter, but will begin again in the spring when new equipment will be used. This will include a new deep diving vessel which will be faster and more manoeuvrable than *Trieste*, although the latter will be refitted and streamlined to give her greater speed. At the same time, navigational aids for the underwater work are being developed.

How then has science benefitted from the loss of the vessel and the deaths of 129 men ?

The fact is that the search has proved that there is no really reliable equipment for pin-pointing a large sunken object in really deep waters. Again, navigational equipment which will allow a mariner to return to precisely the same spot on the surface or bottom is sadly lacking. The problems encountered in the search for the *Thresher* will arise again and again; if not in the same context, there might be, after all, lurking enemy submarines which must be detected. The Americans know it, and the lessons have been well and truly learned.

The result is, therefore, that millions of dollars have been poured into the search and further huge sums will now go into the necessary oceangraphic research. With this sort of backing, it will not be long before new tools and techniques are developed which must inevitably and rapidly bring to science a more complete understanding of the oceans and therefore, ultimately the means of turning it to the needs of man.

Reproduced by kind permission of *Triton.*



Emergency Resuscitation

by Surg. Cmdr. J. M. HANSON, L.M.S.F.A.

EVERYONE connected with underwater activities should be familiar with the principals and practice of emergency resuscitation which includes all forms of artificial respiration and extreme cardiac massage.

As far as artificial respiration is concerned the scope of this article allows only the positive pressure of Expired Air to be discussed. However, it must be remembered that in cases of severe injury to the face, particularly burns, one of the manual methods, i.e. Holger Neilson or Silvester, must be used.

It has now been generally accepted that expired air resuscitation is the method of choice because it has almost all the qualities of the ideal method which aims:—

(*a*) To give the maximum ventilation of the lungs possible under the circumstances.

(*b*) To be easily and effectively applied in awkward positions or situations such as being in a small boat, compartment or still in the water.

(*c*) Not to demand abnormal physical effort on behalf of the operator and can be applied by children.

(*d*) Not to require any gadgets or apparatus.

The only cloud on the horizon is that of terminology. The method has a variety of names ranging from the dramatic 'Kiss of Life' to the rather mundane 'Mouth to Mouth'. However, the International Convention of Life-Saving Techniques of 1960 agreed to use the term Expired Air Resuscitation which covers the mouth to mouth and mouth to nose methods.

Now to technique and sequence of the operation:—

(1) Wipe round inside of casualty's mouth very quickly with finger, to remove any debris.

(2) Working from the side with the patient on his back, place one hand flat on the head pressing it backwards, and the other under the chin, pushing the jaw upwards, and forwards. This will produce what is known as the 'Sword Swallowers' position.

(3) The operator then takes a deep breath places his mouth over the patients mouth and at the same time pinches his nostrils, and blows into his lungs. Movement of the chest will confirm that air is reaching the lungs. If not, the position of the head is adjusted as necessary and the manoeuvre repeated.

(4) The operator then raises his head clear of the patient's face, turns his head to watch the chest falling, meanwhile refilling his own lungs and the procedure is repeated. A regular rhythm is thereby instituted and should be continued until natural breathing is restored, or life pronounced to be extinct. When natural breathing has been restored, turn the patient on his side in case he vomits.

If mouth to nose is preferred or indeed warranted due to convulsion or spasm closing the mouth, exactly the same procedure is adopted, but the operator's mouth is now sealed over the patients nose instead of his mouth.

There are some obvious questions which require answers:—

(1) Can the patient's lungs be over inflated ? Virtually no, but care

The diver is wearing an Underwater Swimmer's Dress made from rubber-proofed crimped knitted nylon, and is using SABA (Swimmer's Air Breathing Apparatus).

The suit is manufactured by Dunlop General Rubber Goods Division of Manchester, and the breathing equipment by Dunlop Aviation Division of Coventry.

obviously must be taken with children and infants.

(2) What is the danger of infection ? Virtually none. Nothing is inhaled from the patient, and there is no more risk of infection than there is in a passionate kiss !

(3) Should anything be done about water in the lungs ? As very little water escapes from the small air passages and air sacs, and endeavour to drain the patient does not warrant the delay it might cause in beginning inflation.

(4) What happens if the patient starts to vomit ? This rarely occurs and is very unlikely to happen when a patient is deeply unconscious. However, if it does occur the head should be turned to one side. Afterwards the face should be wiped clean, free airway established, and inflation re-commenced.

(5) Should oxygen be administered if available ? Only if there is a trained operator present, and the oxygen is pure — mixtures must not be used. The administration should be stopped as soon as normal breathing has been established.

It must always be clearly understood that the vital need is to inflate the lungs, and delay, fiddling about, even for a few seconds may prove fatal. Therefore, the immediate action is to commence inflating while simultaneously positioning the head and lower jaw to ensure an adequate airway and the secret here is extreme extension of the head.

External Cardiac Massage

After about a dozen or so breaths, if it becomes apparent that there is no change in the patient's condition, such as colour change of the face or lips, it must then be ascertained whether in fact the heart is beating. Feel for the pulse in the neck, i.e. the carotid pressure point. If this is absent External Cardiac Massage must be started. The idea is to compress the heart between the breast bone and the spinal column.

Working from the side of the patient, place the flat of the hand on the lower half of the breast bone and cover it with the second at an angle. Then apply about eight sharp presses after each inflation.

If there are two people present then one can carry out the massage after the inflation by the other. There are, of course, dangers in using this manoeuvre and the operator must use a commonsense pressure in relation to the physique of the casualty.

Finally there is an excellent Admiralty Film on Emergency Resusitation which every diver should have seen or make a point of seeing at the earliest opportunity, and Surgeon Captain Mile's book, 'Underwater Medicine', is strongly recommended for those wishing to probe further.

News from H.M.S. 'Messina'

LITTLE is heard from divers operating in and around the far distant Persian Gulf, so here, to bring everybody abreast of the times, are a few words from one of the teams out there.

H.M.S. *Messina* is an L.S.T. (Landing Ship Tanks), one of three working in the Middle East with their support groups. Her divers carry out the routine tasks of foul screws, blocked inlets, etc., and are contin-

uously called upon to inspect the ships bottom which has in her time taken quite a pounding on the various beaches.

One recent job, which lasted three days, was the search for a strong-back of the bow doors. We were at Bahrein at the time and it was eventually found by using a progressive grid search. The Captain gave us his thanks and his parting words were, 'I'm sure they knew where it was all the time'.

Another interesting job carried out by us was on H.M.S. *Redoubt*. She had damaged her rudder during a beach landing and called upon our team to change it, this was successfully accomplished. On her next beaching she knocked the other rudder off so we had a further nights work fitting a new one.

When time permits we manage to get away from the ship and enjoy the fabulous diving to be had out here, one place in particular is off an Island called Sir, Abu Nuair. The sea-bed around the island is a mass of colour, the coral formation and fish there leave one speechless. Anyway who wants to speak to fish.

Our Team is:—

Lt.-Cdr. Parker, C.D.O.
Lieut. Wykeham, S.W.D.O.
L./Sea. Pickering, F.D.
A.B. Willson, C.D.
A.B. Kester, S.W.D.
A.B. Sheldon, S.W.D.

When this article goes to print we will be donning our 'dry suits', for after eight months in the Sunny Gulf with sea water temperatures reaching the 90's we are leaving and going to Gibraltar for a while, where we are told the water temperature is 45 degrees. Parting thought, Brrrrr !

Promotions and Advancements

To Chief Petty Officer:
J. Semple, C.D.1

To Acting Petty Officer:
A. Rose
G. W. Martin
D. U. Williams
D. W. Audoire
L. Fisher

To C.D.1:
A./P.O. Rose, A.
A./P.O. Sharpe, L.
A./P.O. Adam, R. M.
L./Sea. Smith, D. L.
L./Sea. Lockwood, D.

To C.D. 2:
P.O. Roberts, J. P.
A./P.O. Shennan, K.
L./Sea. Fegan, J. F.
Act. L./Sea. Thomas, W.

To C.D. *:
Act. L./Sea. Peters, C. A. R.
A.B. Docherty, A. P.
A.B. Cooper, D.
A.B. Harpley, C.
Stwd. Young, R.
Act. L./Sea. Pastides, M.
A.B. Mantanle, T.
A.B. Crawford, B.
R.O.2. Brown, D.
R.O.2. Leishman, H. R.
A.B. Malham, K. J.
A.B. Altoft, R.
A.B. Stephens, J. R.
A.B. Thatcher, T.
A.B. Revels, J. B.

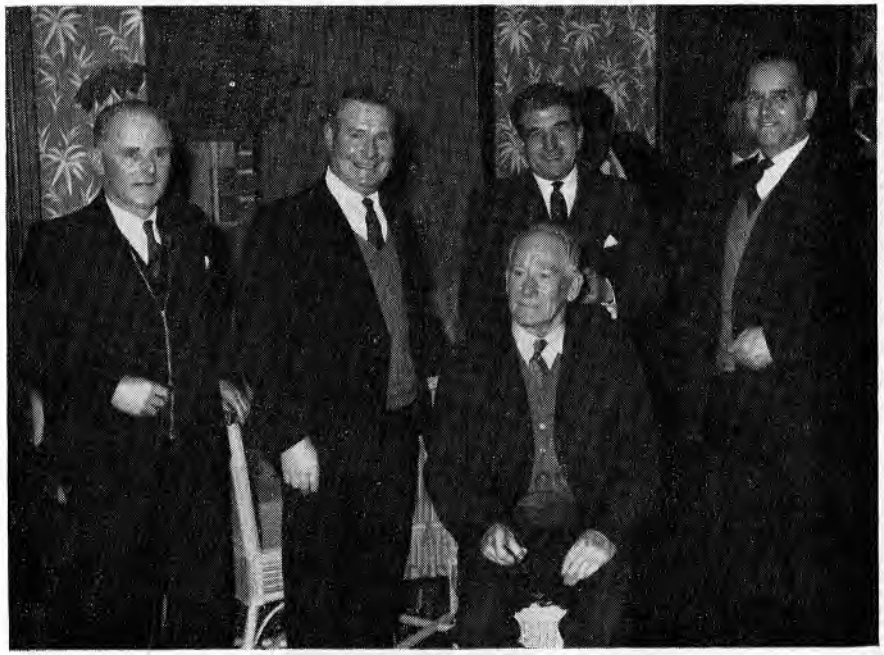
Annual Divers Dinner and Dance

MANY letters are received in this office asking the whereabouts of old team and ship-mates. We try to help as much as possible but surely the best medium (for those living in U.K.) is the Divers Dinner held at Kimbells, Southsea each year, usually early December.

Last year's Dinner was a typical example of the union between the old and the contempory divers. The photograph depicts several characters who have kept in touch throughout the years, these and many others were household names in the 1930 and 40's, and our thanks go out to them for their support throughout the years. At the 1963 Dinner, speeches were kept to a minimum. Lt.-Cdr. Checksfield made the opening address, followed by the Captain of H.M.S. *Vernon*, Captain D. M. H. Stobie, D.S.C. Lt.-Cdr. McLanachan (Mr. Mac. retired) was then hauled to his feet and the joke he told will be repeated for many a year to come.

After the dinner (all wine having been consumed) members wasted no time in filling the bar. The thirst of divers has always been something to be reckoned with, and the numberless barmen were kept busy till they closed the bar at midnight. A certain J. E. H. (who wishes to remain anonymous) decided that the talk was getting boring, so with glass in hand (empty) promptly fell asleep.

In conclusion, many thanks to Lt. J. J. Parry for his organisation and the forebearance of the Kimbells Corner House, which made the success of this dinner possible.



Far East Clearance Diving Team Successful Again

MEMBERS of the Far East Fleet Clearance Diving Team might well wonder what South East Asia would do without them! There is hardly a week in which they are not engaged on 'extra-mural' work for non-Naval authorities. They are frequently called in by Singapore Police to search for bodies in rivers and reservoirs — their last body turned up walking in a near-by street to the relief of relatives — they have now lost count of the number of Japanese unexploded bombs and shells rendered safe in and around Singapore. Their services also extend to the salvaging of ships and the demolition of underwater hazards, but their most unusual job has been the recently successful salvage of more than 100 tons of oil well equipment off the Brunei Coast, seven miles out to sea from Seria. Six of the team have just returned to Singapore Naval Base after a months' work underwater there, off the coast.

Because of the depth of water in which they had to dive, the divers were able to work only 40 minutes at a time and were then forced to rest for 12 hours before their next dive. Working in relays they dived 'round the clock' to save the equipment which included 7,000 feet of oil drilling pipe.

The equipment was part of an oil drilling rig called *Sidewinder*, belonging to the Zapeata Off-shore Company of Houston, Texas, and working under contract for the Brunei Shell Petroleum Co. She had a displacement of some 3,000 tons and, unlike the conventional off-shore rig which is supported clear of the water on hydraulically operated jacks, remained floating moored by eight 10 ton anchors each with 1,500 feet of cable.

Drilling was held up in the mid-December because of gales, and during one night, reported 50 m.p.h. winds and 20 feet waves parted some of the 'well head' supporting guys and equipment standing about 40 feet clear of the water disappeared from sight. To assist in salvage operations the divers had to place plastic explosive round damaged sections of 28 inch piping.

Lt.Cdr. David Burstall, R.N. the Fleet Clearance Diving Officer, reported on his return to Singapore: 'This was an extremely interesting job with a variety of problems never before encountered. It was most satisfactory that the job could be properly finished, and working with the British, Dutch from Shell and the Americans from Zapata was of great value. All the divers now want to take up drilling and the drillers wish to qualify as divers.'

NAVAL NEWS SUMMARY.

1964 'Vernon' Road Race

THIS years *Vernon* Road Race must surely be the longest on record, it started at the Heliport in H.M.S. *Vernon* at 1530 on Thursday 20th February 1964 and finished on 5th March 1964 at 1554, also a Thursday.

Let me explain; the original 82 starters left *Vernon* at a 'cracking' pace; down towards Clarence Pier they trotted, spreading out a little by this time, along the front to where the markers should turn them around for the return journey. Alas no markers,

they had somehow been placed in the wrong positions. So on went our enthusiastic runners no doubt losing a little of their enthusiasm by this time, along towards Eastney. Back in *Vernon* a crowd had gathered outside the Gym. to applaud this weary band of warriors, but the minutes ticked by and still no warriors, finally a whisper was heard that the runners had taken the wrong turning (or not turned at all) so the crowd dispersed. It appears that they were turned around, but not until they had added a considerable distance to the three and a half mile course. Divers can take heart in the fact that we would have taken first place in the team event but it was quite rightly decided that the race had to be re-run at a later date; this turned out to be 5th March. Much the same happened on the re-run except that the runners were turned at the correct place and that the *Deepwater* Divers were placed second. As the original team could not be spared for the re-run (due to training commitments) great credit must be given to the four runners who did so well at short notice by coming in second.

Deepwater 'Pirates' Rugby Club

THE Pirates as many of you will have heard if not felt, are now a well established side. At the beginning of this year the reins were handed over to P.O. Charlie Charlwood, although P.O. Taff Roberts kept a close eye on things.

The new Committee is:—

President: Lieut. C. L. Lawrence
Secretaries:
P.O. V. Gibbons
P.O. A. Charlwood
Coach: Mr. K. L. Edwards
Committee:
P.O. L. Maynard
A.B. Dolan
L.S. Stephens

By some means or other we were entered for the Command Rugby Knock-out Competition, the first match played was against H.M.S. *Bellerophon*. This match turned out to be a 'hum-dinger', neither side giving an inch. The result was a very fair draw 3—3, both sides conceding tries, neither converting.

The replay was much the same and proved just as tough but due to a perfect interception by the Pirates wing who went over to score, (which duly converted), the game ended in our favour 5—3.

The second round was drawn against H.M.S. *Collingwood* 1st XV. The Pirates put a grand show of hard tackling but the *Collingwood* three-quarters dominated the play with their speed and brilliant passing. The final score was 35—0, *Collingwood* went on to win the competition outright both their teams reaching the finals.

Of the friendly matches much could be said, but it is enough to know that a good time was had by all, and we've even been invited back.

At this point I must, on behalf of the Club, thank two men who have helped us so much in this our first season, they are Ken Edwards our Coach and Yeoman Bill Scrivens. Also we say goodbye to Taff Roberts who founded the club, wishing him all the best in Civvy Street, O'r brodyr y dyfroedd dwfn a'r plant y dyfnderau dyfrllid. Keep in touch Taff.

We are already making plans for the next season and club members are requested to send their 3/- on receipt of fixture list. The stocks of shirts, shorts has been depleted, these will have to be replaced.

One last word, new members are always welcome, you don't have to be able to play we'll teach you — Good old Ken.

V.G.

Body in Reservoir

ON the night of 22nd November 1963 a man dragged the body of an 18-year old girl from the boot of his car and threw it over a viaduct into the Ladybower Dam, Bamford, near Sheffield.

The Reservoir was at one time a Y shaped valley, in which two villages were situated: Derwent & Ashapton. As the water requirements of nearby cities and their industries grew so it was decided to Dam one end of the valley and flood it. The villages were rehoused and their villages demolished, with the exception of the church tower, the spire of which remained standing clear of the water, when the valley was flooded.

This was a novelty to sightseers, but nearby villages were soon complaining of the tolling of the bell on windy days and nights. It was decided that the spire along with the bell must be demolished. The local authorities requested assistance from the Royal Navy. A team of divers led by Lt.-Cdr. W. Y. McLanachan demolished the spire to below water level.

So once again Naval divers visit Ladybower, this time with the sinister task of finding and recovering the body of a young girl. Police divers had attempted a search, but due to the depth of water, which was 120 feet in places and lack of equipment, their search was unsuccessful.

H.M.S. *Vernon* received a call at approximately 1400 hours on 28th November 1963. It was decided to send Lt. K. D. Kempsall, G.M., Petty Officers Lott, Gunnell, Charlwood and Futcher to the scene in the Landrover, Able Seaman Gardener followed shortly after with the main equipment in a 3 ton lorry, the equipment comprised of a compresser, gemini and engine, two sets of S.D.D.E., S.A.B.A. headlamps, cordage and search gear.

Petty Officer Charlwood takes up the story from here . . . We departed from *Vernon* at about 1630 after taking P.O. Gunnell and myself from the rugby field, which incidently resulted in one of our rare defeats. Apart from a couple of hold-ups we had a fairly clear run up to Oxford where we stopped for food and liquid refreshments. On to our destination finally arriving at the small village about 12 p.m.

We did not know how to find the County Police so we knocked up the local Police Sergeant. He was not very pleased at being dragged out of bed, but put on a brave smile (and some clothes), and soon got in touch with H.Q. who promised to send down a car to direct us. After a ten-minute wait a battered old Ford Popular drew up alongside us, which was greeted by Lt. Kempsall with the words 'Are you the Z Cars'.

The policeman then led the Landrover (full of curled up divers) to the County H.Q. On arrival we were given a meal and tucked up in bed by the duty sergeant.

In the morning having a large breakfast we met the Police Inspector in charge of the case. After Lt. Kempsall had discussed the job with him we drove up to the Ladybower Dam. P.O. Gunnell and myself made the journey in the back of the inspector's car, trying to look as innocent as possible to the public we passed. On reaching the reservoir the inspector showed us the spot where they thought the body had been thrown in, this point was approximately in the middle of the viaduct. This first morning was spent getting our gear ready and laying jackstays parallel with the viaduct. In the

afternoon we dived on the jackstays in S.A.B.A. Because of the depth (120 feet) we were limited to the time we could stay on the bottom as we did not have the endurance to do stops in S.A.B.A. That afternoon we only had time for four divers to descend and search, we also found that the long jackstays tended to get snagged up, so before packing up for the night it was decided to lay 50 feet jackstays, 6 feet apart running out from the viaduct and starting just out from shore. The following morning we obtained a large punt, which gave us more room to move with the S.D.D.E. we had no success. P.O. Lott was the only diver who had to do stops, much to his disgust. Our compressor broke down during the day so the Police arranged for a fire service compressor to recharge our bottles.

Next morning which was Sunday, Lt.-Cdr. Rea and his team arrived to relieve us, but it was decided that we were to carry out the rest of our dives that morning. After a couple of dives, P.O. Lott straightened out the jackstays which were getting out of line, he lifted them and relaid them straight. P.O. Gunnell went down on the re-laid jackstays and within three minutes he gave the signal five bells which meant he had found the body. He was assisted up with the body and it was placed in the boat and taken to the shore.

Our work complete, we collected gear together and with the help of Lt.-Cdr. Rea's team loaded the lorry. After we had changed, had dinner and a drink with the Police (whose co-operation had been remarkable), we started on the journey home.

CHAS.

The Passing of the 'Copper Helmets'

By "J.W."

1964 sees the passing of the 'Tin Hat' — 'Steamer' — 'Standard Diver', the end of an era but, with the traditions and loyalties being continued by the self contained and light weight diver, or commonly called "Corkhead".

For almost 200 years the Standard Diver has carried out sterling service in the Fleet. In fact it was in the year 1782, in which H.M.S. *Royal George* was sunk at Spithead, that saw the birth of diving in the Royal Navy.

Like so many other techniques it was the Sappers (Royal Engineers) who showed us the way. From then on the normal divers have made a remarkable contribution to the Fleet and diving throughout the world.

Not only did the Royal Navy hold the World's Deep Diving Record for many years but, in close co-operation with such great men as Sir Robert H. Davis and Professor John Haldane, not to mention our own Captain G. C. C. Damant, C.B.E., have introduced techniques which added much to the safety and efficiency of the diver.

In 1939-1945 came the influence mine and underwater sabotage charge, with these came the need to provide the diver with self-contained streamlined equipment, ensuring mobility which was so essential.

The stories of the 'Frogmen' activities are now legend but from then on the 'writing was on the wall' for the Standard Diver, and this was underlined when the responsibilities for 'Salvage were retained by the civil side of the Admiralty.

Although for several years yet we shall have in the Fleet a few Q.D.D's and D.1's to all intense and purpose the Standard Diver became extinct on the first day of this year. So it is with regret that we say farewell to an era extending over a period of 180 years and hope that the 'new look' will at least emulate this period of performance.

J.W.

Salvage of the Phillipine Naval Ship R.P.S. 'Isabella'

PEARL Harbour, Hawaii . . . The perseverance and skills of the men who sail the Pacific Service Force Salvage Ships are almost legendary, and nothing could sustain this legend more than the recent salvage of the Philippine Naval ship R.P.S. *Isabella*, formerly U.S.S. *L.S.M.*-465.

For 14 days, including Christmas and New Year's, U.S.S. *Conserver* battled 20 to 30 knot winds and numerous mechanical failures before, with assistance from U.S.S. *Cocopa* and R.P.S. *Ifugo*, the grounded Philippine ship was freed.

The story actually begins last September, when *Isabella* was hit by Typhoon Gloria and grounded on a reef near the village of Currimao, Luzon Republic of the Philippines. *Isabella* was left high and dry, 300 feet from shore and 300 feet from floating water depth. Even at high tide the water barely wet her bottom.

The Philippine Navy was unable to get *Isabella* afloat, so they requested the United States aid them in a joint effort. The U.S. Navy responded, and the Commander Naval Forces, Philippines, was designated in charge. He sent his Salvage

Officer, Lieutenant W. H. Smith, to the scene. Commander Service Squadron Three was requested to provide a salvage ship and the U.S.S. *Conserver* was assigned.

On December 14th 1963, Lt.-Cdr. D. T. Lamb, Skipper of the *Conserver* and Lt. Smith, formerly Executive Officer of the salvage ship U.S.S. *Safeguard*, arrived for a preliminary inspection. They found the hull of *Isabella* sound except for a half inch hole which was easily plugged.

Philippine Naval personnel had already raised *Isabella* from the coral with hydraulic jacks, and she rested upon telephone poles which were to be used as makeshift rollers. The rudders, propellers and tail shafts had been removed and the rudder post trunks plugged. Philippine Navy divers had also begun blasting a channel through the coral for *Isabella*.

Lt.-Cdr. Lamb and Lt. Smith withdrew to Subic Bay, returning five days later aboard *Conserver*.

The job ahead was formidable. *Isabella* represented a total displacement of 540 tons which was hard aground and had to be dragged into deep water.

Conserver began sending her divers to continue blasting a channel through the reef. Meanwhile, she laid three sets of beach gear to *Isabella* and two sets to herself. (Beach gear is a four-part pulling rig consisting of a large anchor and a heavy system of wires and sheaves that multiply the ship's pulling power, each set is capable of about 50 tons pull).

Explosive charges, to be detonated when *Conserver* reached maximum pull were placed near the *Isabella*'s hull to help jolt her free, after 1½ hours pulling one of the beach gear sheaves carried away, operations were suspended.

That night, repair gangs worked late to re-reave the beach gear.

Christmas Day, *Conserver* tried again but just when she was exerting maximum pull of close on 300 tons, and just as *Isabella* appeared to shudder the tow wire's shackle pin parted. That night their crew worked to rig a new tow wire.

Early the next morning, the tired crew completed rigging the tow wire and commenced another pull. Three minutes after reaching maximum, and with luck running true to form a link in the tow wire's chain bridle snapped, causing damage to tow wire. Much of *Conserver's* difficulty was caused by 20 to 30 knot winds blowing directly abeam, these winds continued throughout most of the salvage operation.

Three more attempts were made, one being defeated by the main tow wire parting, another by the damage to *Conserver's* pawl assembly of her main winch. On the third of these attemps one of *Conservers* beach gear anchors slipped causing, further damage to her winch.

As the sun rose on December 30th, the situation looked bleak. The towing machine dog was in-operative and the critical tow wire had to be patched up and re-clamped. There was no rest for *Conserver*, the men worked to ready the ship for another try the next day, undaunted by the series of mechanical failures.

On New Years Eve, Lt.-Cdr. C. A. Nelson in command of U.S.S. *Cocopa* arrived from Subic Bay and plans were made for co-ordinated pull the next day, R.P.S. *Ifugao* was repositioned. Early New Years morning, *Cocopa* passed her tow wire to *Isabella* and laid one set of beach gear, then the Ships began their pull. Seven sets of beach gear strained, and *Cocopa*'s engines, turning full power, roared. Fifty-two minutes later *Isabella* lurched back-

ward two feet, then *Conserver*'s overworked starboard bear gear gave way. Lt.-Cdr. Lamb quickly ordered all engines full ahead. *Conserver* leaped to life, water surging from the action of her twin screws, and 16 minutes later *Isabella* jumped 10 feet. The ships continued to strain, all the time being buffetted by 20 to 30 knot winds. Then *Isabella* jumped another 6 feet, shuddered, and began a steady movement toward the water.

As R.P.S. *Ifugao*, with *Isabella* in tow and *Cocopa* escorting, began the trip back to Subic Bay, a weary *Conserver* stayed behind to recover her beach gear and salvage equipment. *Conserver* sailors, exhausted from their labours, watched longingly as the three ships disappeared over the horizon. They had known no Christmas or New Year's holiday and had only blisters on their hands and circles under their eyes to show for the normally festive season.

On January 2nd, as *Conserver* headed towards Subic Bay for a much needed rest. Radm Kefauver sent a message citing their professional competance and outstanding performance in refloating the high and dry *Isabella*. He ended his message saying, "It (refloating *Isabella*) was a most auspicious way to begin theNew Year. WELL DONE !"

U.S. NAVY NEWS RELEASE.

Diving for an Oil Company

OASIS Oil Co. is an operating company for three major companies, Continental Oil (Jet in U.K.), Marathon Oil and Aramco, we also have small affiliations with W. R. Grace, Esso Libya and Mobil Oil.

Our main task consists of maintaining an offshore loading terminal at Ras Es Sider which is on the Libyan Mediterranean coastline, approximately halfway between Tripoli and Benghazi.

The team here, all ex-R.N., are Don Wright, Pat Hammill and myself Mike Pemberton, between us we maintain two existing sea berths, with a third nearing completion and a forth 'on the stocks'. Each berth is in about 70 feet of water and approximately 2,200 yards offshore, in an open roadstead. These berths are fed from shore by a 36 inch diameter steel pipe which terminates at a header and thence emerges in the form of two 16 inch flexible rubber submarine hoses, which again reduces to a 12 inch rubber hoses. Bursts are thankfully rare, but always seem to happen at the wrong time. The mooring buoys are fitted with heavy duty wires used for securing the ships and although normally supported by a float these are another item which takes a deal of maintainance, and it is a fair swim from buoy to end of the wire (shades of Horsea Island early morning swim). Lost anchors are not infrequent and of course we have the occasional foul screw. General scavenging for lost items, routine inspection and cathodic protection readings seem to make up our work catalogue.

The team does however carry out all the marine maintenance work of the terminal both sea and shoresides.

Our equipment consist of Standard, Airline-lungs and Aqua-lungs, we also have underwater cutting and welding gear. We hope, soon to be equipped with a Decompression chamber to allow us surface decompression for speeding up the process of hose changing. For support we have 45 feet mooring launches a 90 foot × 40 foot barge which we have fitted out with 40 foot sheerlegs.

For a diving platform we have a catamaran made up of two surplus steel pipe lengths, with a wooden working platform. In close vicinity we have 'Glomar 5, an offshore working platform with oxy-helium gear in about 240 to 300 feet of water, guided by Ray Johns. Just along the coast at Marsa El Brega there is a similar Esso terminal operating under the control of Ron Coleman, so altogether the 'Dip chicks' are well represented in Libyan waters. In closing I might add that we are always wide open for visitors from passing ships, or should a ship be at Tripoli usually one of the team is in town and will willingly guide you to the local 'Shot-Rope'.

MIKE PEMBERTON.

The Trials of Eskimo Nell

BEING now twelve months in Commission, it is time to aquaint the world with the exploits of our happy band of Bubble Bos'ns in *Eskimo*. (*Skeemo*, as pronounced in the vernacular of both Aden and Mombasa).

We Commissioned in the frozen month of February 1963, at Cowes, with a Team consisting of one S.W.D.O., one S.C.1, five S.W.D's and only one S.A.B.A.

Much to our disgust, the first job carried out on 'Nellie' was by a team from the School, who were called in to replace our 162 windows. Thus our story does not start as early as it should, our first dive being at 'Pompey' in late April, using borrowed equipment, to find one bathythermograph inadvertently sent for a swim without a lifeline. Naturally we did not join in the general condemnation of the nimble fingered 'person' responsible for perpetrating this outrage, as at long last we were presented with a golden opportunity to prove to the assembled Ship's Company, the fact that we could actually breathe down there. It was unfortunate that the d - - - - thing was not found until the second day, by which time interest had worn a bit thin — not even a ship's cat to applaud. However, we did disprove the rumour that we could not even find the bottom.

One can imagine how some Pusser's ears must have turned a bright red, as with the approach of our Work-up, there was no sign of the bulk of our equipment arriving, with the consequential loss of opportunity to aquaint ourselves with our own hull. However, our own Pusser manned the 'hot line' and the gear arrived just one day before we sailed for Portland — in the nick of time.

The Work-up at Portland, (where else ?) in June and July, passed reasonably uneventfully from the diving angle, with the normal practices and no re-scrub on Awkward. Although it was necessary to change a 162 window again during this time. This was done at night, with the aid of ceremonial floodlighting rigged under water and two upper deck ladders lashed together as a stage. We worked in relays all night from 1715 until 0600, the Divers down observing sunset in the correct manner, as prescribed in B.R. 1834.

In July, five qualified S.W.D's bumped our numbers up to the portly figure of 12, but then we suffered the misfortune to lose our S.C.1 Cpl. Sheehan, who became an unwilling (I hope), deportee to Eastney. We were sorry to lose him and wish him well.

July 29th saw our departure for all points East of Suez and warmer

waters. Aden being our first port of call 'on station', where we promptly started work on a slipway at the R.A.F. Small Craft Base, taking over from a team from *Sheba*. Apparently the slip, constructed of concrete blocks weighing 19 cwt. each, has been laid with the help of a native diver, who relied on a pair of lungs and a duration of about one minute flat. Our task, which was to straighten and close up the blocks (dressed by the right and tallest on the flanks), proved to be beyond our capabilities and after two days very strenuous work we were compelled to admit defeat. We were able to offer one piece of valuable advice however, 'Blow the blessed thing up and start again'.

The next work of any magnitude and interest which came our way, was in September, when H.M. Submarine *Alliance* fouled an oil pipeline with her best bower in Aden harbour. This was a job right up our alley and was successfully completed with the aid of a tug and floating crane. Great sighs of relief all round when the pipeline was found to be undamaged and likewise an underwater telephone cable which had also joined the melee. At one stage though, I believe *Alliance* got quite worried, when in our efforts to dislodge the anchor the Sub's No. 1 had visions of parting company with the jetty.

September was also marked by the addition to our Team of one Midshipman and an onslaught by the combined Teams of *Nell* and *Nubian* on the latters bottom. In four hours we scraped and scrubbed her clean from stem to stern. Much to our chagrin, it has been found since that the difference this made to her speed was negligible compared with the more simple expedient of just cleaning her screw.

Submarines again. This time at Karachi. The *Amphion* had a split in an oil fuel saddle tank. Repair was affected with underwater cement and was effective enough to last throughout Midlink 6. At least, I have received no complaints.

Midlink 6 by the way, was another Portland type Work-up almost, and was marked by a night Awkward. An interesting point here being that *Ashanti*, *Nubian* and *Eskimo* were alongside each other at an alongside berth, with *Amphion* tacked on outboard. It was decided that we should search aft on the three frigates and *Nubian*'s team forward, whilst *Ashanti* took the centre section and the Sub'. This arrangement worked quite well, it was speedy and had the added advantage of diving boats not having to be dragged the length of the ship.

On to January 1964, with nothing much out of the ordinary to fill the gap, just routine jobs such as scrubbing the screw and finding the odd article lost overboard.

But at the end of January two interesting jobs came our way in rapid succession. The first was to examine and re-secure the wire purchase on a slipway at Bahrain, to enable an ocean going Tug to be put back in the water. We discovered one thing that day — the Gulf is not always as hot as it is cracked up to be, in fact the air temperature was down to 44° F. (those who prefer C° can work it out for themselves), and I am sure the water was at least 10° colder. Thank goodness our E.O. did not mind being shaken in the middle of a make-and-mend to provide us with hot showers.

The second job was on, or rather under a 30,000 odd ton tanker, which had broken adrift from Sitra oiling jetty at high water springs. She decided to go 'walk about' right at the critical moment between dis-

charging ballast and taking on cargo. As she was then in the lighest condition possible, she was almost high and dry before grounding. Our job was to examine her hull for damage and report on the nature of the bottom. There was no apparent damage and the bottom was sand, so on the strength of our report attempts were made to get her off by brute force and three Tugs, albeit unsuccessfully. We sailed for Mombasa in a hurry very soon after, leaving her still anchored by the keel; however she was gone when we returned to Sitra and I can only assume that the proposed use of H.P. hoses must have been effective.

So much for the highlights of this, our first year. It has been fun and there has been more variety in the work than we, humble S.W.D's that we are, would normally be called upon to perform in home waters — the C.D's hog all the best jobs.

Finally, for those readers of this Journal who may have the idea that certain old shipmates are swinging the lead, here are the names of our Team:—

Lt. (S.D.) (G.) F. W. Drake.
Mid. J. L. Prichard.
E.R.A. R. P. Rycraft.
O.A. K. Johns.
Sgt. (P.T.I.) R. J. Anderson
A./P.O. A. L. Holden.
L.S.A. E. M. Carne.
A. B. P. Aikman.
Mne. D. J. Taylor.
Mne. G. B. Edwards.
Mne. J. Hames.
Mne. F. G. Pelling.
Happy mud-runs folks. F.W.D.

News Bulletin

The Title of the Home Air Command Sub-Aqua Club has now been changed to 'The Naval Air Command Sub-Aqua Club'.

* * * *

1965 will see the opening of a Marineland in Britain. This will be at Southsea, Hants.

* * * *

The first International Water Sport Show is being held at the Alexandra Palace and Lake, London, from 13th to 20th June.

* * * *

Leading Seaman R. J. Pigg, C.D.2, PJ/966697 wishes it to be officially known that his name has been changed to R. J. Page.

* * * *

The U.S. Navy Diving Manual has been completely reissued, dated July 1963 and is available from U.S. Government Printing Office, Washington D.C. (Price $3.25).

Commander Jacques - Yves Cousteau has two programmes for this year, one is the deep-dive submarine, which is designed to operate at more than 12,000 feet, and the other venture planned is at a depth of 160 feet just off the coast of Villefranche where he intends to install his undersea house, this is fully furnished and equipped and has been compared with a comfortable city flat.

* * * *

During a search of the sea-bed in Marsaxlokk, Malta, members of the Mediterranean Fleet Clearance Diving Team saw three feet of the barrel of an old cannon sticking out of the sand at a depth of 70 feet. The position was noted and the cannon subsequently recovered.

The barrel is about 11 feet long. It appears to have been cast at Palermo in 1740 and is in near perfect condition. The gun barrel is made of bronze and weighs nearly 2 tons. It is hoped that the National Maritime Museum at Greenwich will be able to give some more historical information.

* * * *

Reynolds International Inc., of America will shortly be launching an Aluminium Submarine capable of diving to 15,000 feet. The Submarine called *Aluminaut* has a thickness of 6½ inches aluminium, overall length 50 feet and a diameter of 8 feet. Her equipment will include T.V. Sonar, Mechanical devises for picking things off the ocean bed. The *Aluminaut* will be capable of staying below surface for three days and have an underwater range of 80 miles.

* * * *

The Navy Days at Portsmouth for this year will be held in the Dockyard on 1st, 2nd and 3rd of August.

A comprehensive diving display will be given twice daily showing some of the equipment and techniques used in the present day diving of the Royal Navy.

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In Switzerland recently the Submarine *Auguste Piccard* was lauuched, this was at Lake Leman. The Submarine is designed to take tourists to the bottom of Lake Leman (309 m.) at £1 a time.

Diving into Danger . . .

To the World Under the Waves

by STANTON JAMES

IMAGINE that you know where the wreck of a bullion ship lies, and that you are diving with an aqua-lung into the calm sea.

You swim down, and down, and down, until the water gets suddenly colder and the light fades to dusky blue. Your depth gauge shows 200 feet. Another 50 feet, and you can see the dark bulk of the wreck.

But now, with wealth almost in your hand, your head spins, your eyes cloud over, your limbs won't obey your will. It is as if you were drunk. And no matter how much gold lies there, you can't reach it.

Desperately you turn for the surface. Groggily, drunkenly, you swim up.

RICHES.

I know what this feels like. It has happened to me . . . in a search for riches a million times more valuable than any treasure ship.

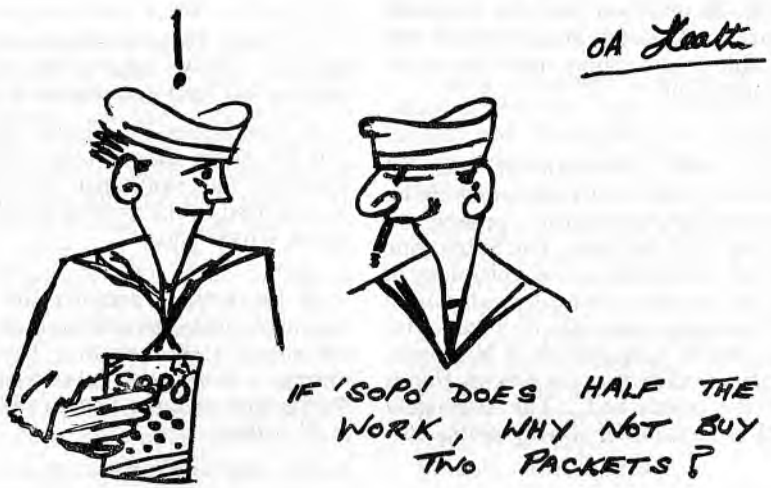
Your head clears. But you must wait a long while below the surface for your blood to get rid of the gas dissolved in it by the pressure.

Now the wealth that lies beneath the sea is so enormous that it is worth any effect, any danger. Even leaving out the really deep seas, there is an empire a quarter the size of the land world—as big, say, as Africa or the Americas. With as much prospect for mineral wealth, and its own kind of farming.

This great unexplored world is called the Continental Shelf. It is a broad terrace of land which surrounds most continents, an average of 42 miles wide, sloping gently down from the shore to a depth of 300 or 400 feet. It is shallow enough for light to penetrate. And where there is light there is life.

KILLERS.

Before it can be explored scientists must find what goes wrong with dives



like the one I've described.

Well, you were breathing compressed air, a mixture of 20% oxygen and 80% nitrogen. And three things go wrong with air as you approach 300 feet.

First, the air gets so thick that your lungs can't pump enough of it in and out to keep you alive. Then the oxygen becomes intoxicating and produces fits. And the nitrogen probably becomes poisonous too. Any one of these can be a killer. But now a way past these dangers and into the new world under the sea is being found.

Off the island of Teneriffe, six Royal Navy divers have spent 10 minutes at a depth of 450 feet; now the same team is working in pressure chambers at Portsmouth to test their methods to 800 feet.

The Navy divers used a mixture of 13% oxygen and 87% helium — a light gas easy to breathe under pressure. Because there was less oxygen than in air, poisonous oxygen concentrations were not reached.

Try a dive the Navy way. H.M.S. *Reclaim* is rocking at anchor off Teneriffe, and the huge submersible decompression chamber is being lowered into the water—a steel cylinder with pressure-tight hatches top and bottom and cylinders of gas on the outside. Inside are two divers, breathing through aqua-lungs attached by hoses to the gas cylinders. While the chamber descends they raise the gas pressure in it. When it stops at 450 feet they swim out through the open bottom hatch to the full 30 feet of their hoses.

BENDS.

Their 10-minute exploration over, they return to the pressure chamber. The chamber is hoisted aboard the ship and sealed on to a larger decompression chamber where the divers can wait in comfort while the pressure is lowered slowly.

A 10-minute dive to 450 feet used to need three hours spent slowly getting the pressure down to normal —and even then half the divers got 'Bends' — the painful, sometimes fatal, result of bubbles of gas forming in their blood.

New experiments have cut this time by three-quarters of an hour, and nobody gets Bends.

This paves the way for men to work regularly at great depths — first exploring, then harvesting.

LARGER.

Scientists want to know how plants grow there, how the young fish dwelling on the sea bed find their food, so that there can be more food for the worlds nets.

They want to know about colossal underwater landslides, and seabed rocks. In this undersea empire there must be mineral ores and oil. To get them, diving to great depths will be essential. Even when automatic machinery is installed, divers will be needed for maintainance.

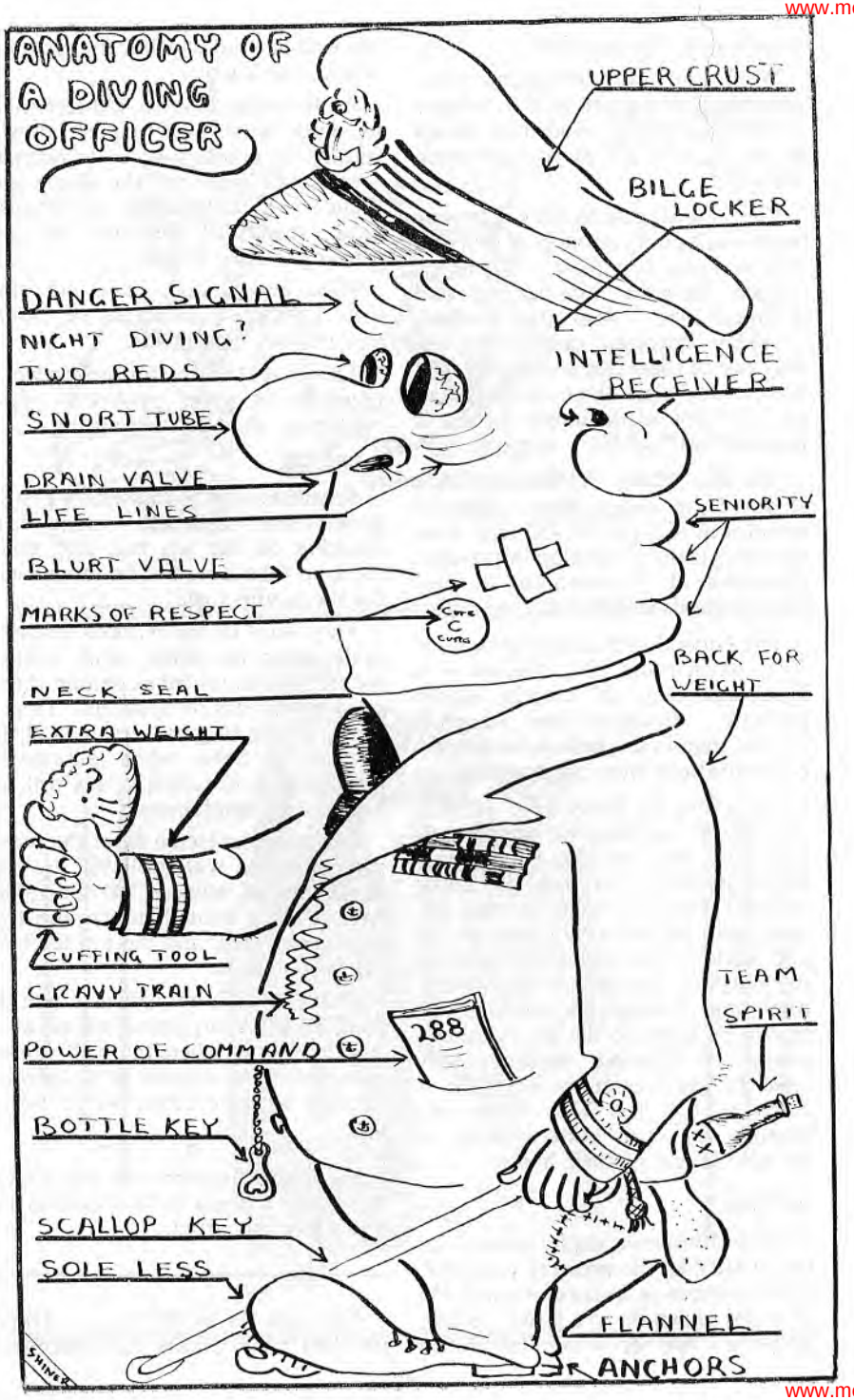
Diving unprotected from the pressure of water will probably have a depth limit of between 500 and 1,000 feet. This is enough to explore the continental shelf and the top level of the deep oceans.

That is a rich enough new world. But it is only a tiny part of the oceans. And beyond it, where the shelf slopes away into the darkness of the abyss, there is an even larger world waiting . . .

* * *

We wish to express out thanks to the *Daily Express* for permission to reproduce this article.

Note left for milkman . . . Have just had baby, please leave another.



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Duncan spotted Jock, dressed in the kilt, on Glasgow railway station and asked him where he was going.

'Edinboro' he replied, 'It's my honeymoon'.

'And where's the lucky bride ?'

'Am no taking her,' said Jock 'She's been there before'.

Interesting fact — in the last 4,000 years of history, there have been 268 years entirely free from war.

WANTED URGENT . . .

Ex-Native wishes to exchange book of telephone numbers for road map of Hong Kong, alternatively would change drafts.

'Course I've anuver suit ! me 3's.'