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ROYAL NAVAL

DIVING

MAGAZINE

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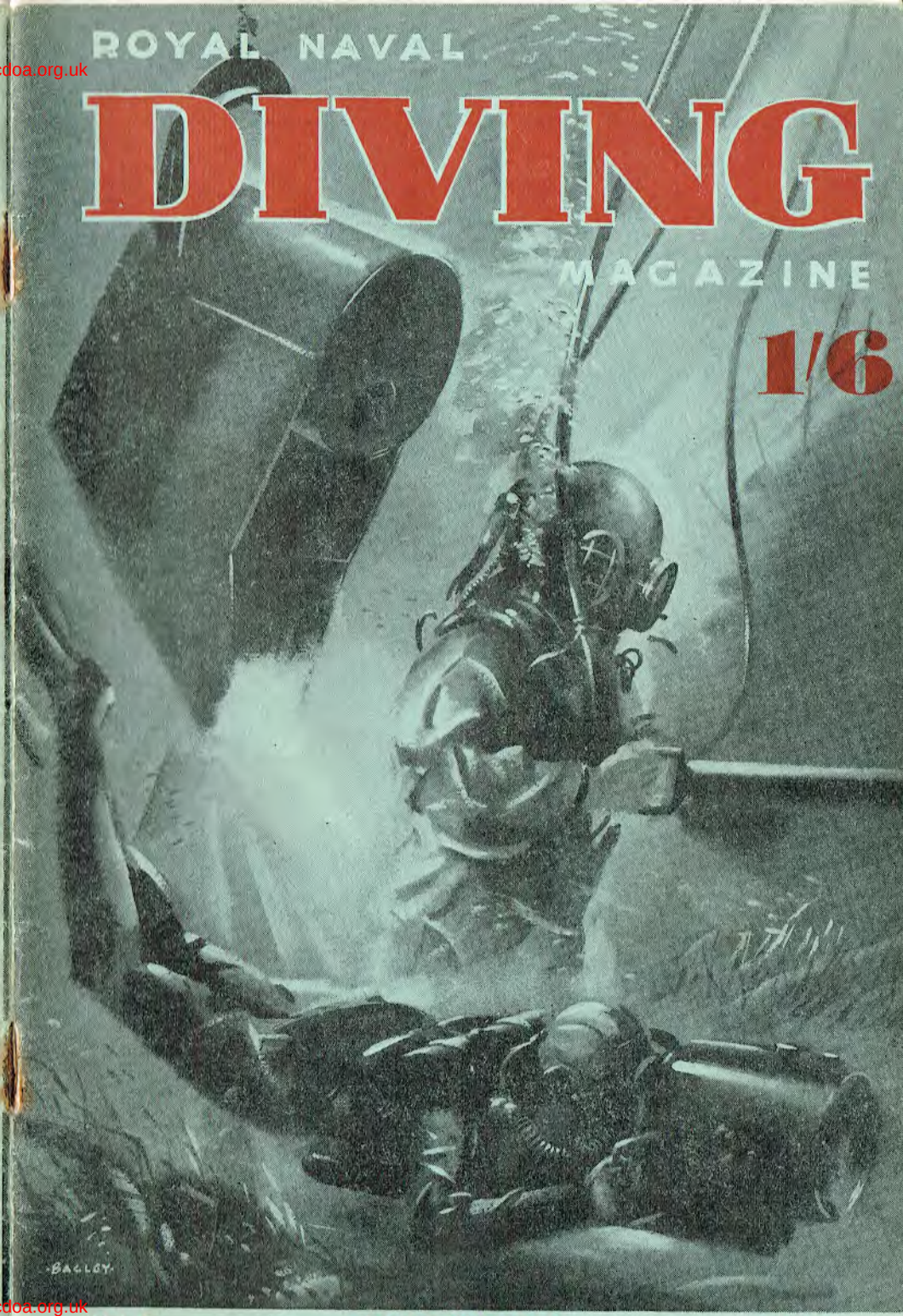

Vol. 5 H.M.S. VERNON No. 1

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R.N. Diving Magazine

EDITORIAL STAFF

Petty Officer R. W. Collar, *Editor.*
Lieutenant P. A. Hawke, R.A.N., *Treasurer.*
Instructor Lieutenant F. J. D. Kelly, B.Sc., R.N., *Secretary.*
Lieutenant (S.D.) W. Y. McLanachan, Chief Petty Officer R. Foord, R.A.N. } *Employment Bureau.*

Vol. 5 April, 1957 No. 1

EDITOR'S NOTES

Hello Readers,

Once again we are able to give you the latest gen. although for a while lack of material had us worried. Remember that others in the Branch would like to hear what you have been doing.

It has been suggested that we have a 'Questions and Answers' section in the Magazine on similar lines to some of the periodicals and daily papers, so if you have any diving problems, send them in and we will do our best to answer them. Please note '*only*' diving questions, and not such things as 'What did Nelson die of?' You may also send us 'Diver's Howlers' which I know very often come to light over the convivial pint of mixture.

It was hoped that some of the 'Steamers' would send us some accounts of their adventures whilst working in the Suez Canal, but so far it seems as though they are keeping quiet about it, and have not done anything to write home about, or else they are so worn out and tired that they have not recovered sufficiently to put pen to paper! So if you hear any yarns about 'What WE did do' and 'What WE didn't do' ask the person concerned to send it into the Magazine.

The last of our Suez brigade returned to the fold sprouting a very nice display of face fungus. 'Jan' Fripp is the man and having had his leave is once more ready for the fray.

As you will see from the Portsmouth Notes, quite a few alterations are taking place for the improvement of the section and the comfort of the divers and classes. It is hoped that we can continue these improvements in the section, despite the threats of cuts in expenditure and personnel, so that we may achieve a standard of training conditions comparable to those of other Navies.

This is not to say that the system does not produce in our opinion, the finest divers in the world.

We are trying to introduce more technical articles into the Magazine, so if you care to write any, we shall be very glad to receive and print them if suitable. This will make your Magazine both a technical and 'news-from-afar' one. You will notice too, that we are printing the names of all who advance in the Branch, so you will just know who is coming along. We would be glad to hear of the 'Steamers' who do their courses in the other Home Ports.

Finally, let us have some articles from other Navies particularly those within the Commonwealth, so that our readers will get a truly world wide picture of the advances in diving techniques and training. Did you know that the Magazine is now sold in numerous countries throughout the Western World? Incidentally we still have a few copies of previous editions of the Magazine left and if you would like one let us know. Cost is 1/- per copy and better you read them than they sit here in the office.

Lieutenant Chadwick's death came as a shock to the many 'elder brethren' of the diving fraternity. May we of the Magazine staff on behalf of all our readers extend our deepest sympathy to Mrs. Chadwick and family. An obituary appears on page 9.

All the best until the next edition, due to appear on the 30th June.

EDITOR

TREASURER'S NOTES

Dear Readers,

Thanks to the excellent work done by Lieutenant Newman and his colleagues, we now have a very satisfactory credit balance which can be used for the benefit of the dependants of any of our divers who may be injured in any way.

As you will remember our last issue was a little smaller than usual, and the difference in production costs amounted to £4 10*s* 0*d* — we added 10/- to that and sent £5 along to the Lord Mayor of Portsmouth's Appeal for British Refugees from Egypt. It seemed to us that the target of the Hungarian Relief Fund had already been reached. The Lord Mayor's acknowledgment appears in our 'Letters to the Editor' section.

Much to my regret I shall be Treasurer of the magazine for this one issue only, and the Chair will in future be filled by Sub-Lieutenant (S.D.) Smith. To him I say 'Welcome', and to you, our readers I say 'Farewell.'

TREASURER.

SOLUTION TO CROSSWORD No. 2

Across—(1) Boats Falls; (8) Adonis; (9) Sack The Lot; (10) Ulster; (12) Nonsettler; (13) Arabic; (15) Lioness; (19) Nestles; (21) Aeon; (22) Stamen; (25) Detonators; (27) Ironed; (28) Unshackled; (29) Carton; (30) Evergreen.

Down—(1) Basinfull; (2) Accent; (3) Sitter; (4) Alert; (5) Saturate; (6) Constant; (7) Life Line; (13) Use; (14) Inn; (16) Interval; (17) Nominate; (18) Sand Dune; (20) Subsides; (23) Cancer; (24) Coolie; (26) Other.

FIRST SEA LORD,
ADMIRALTY,
LONDON, S.W.1.

21st February 1957

Dear Kelly,

I should like to congratulate you, Mr. Newman and Petty Officer Collar and any others on the editorial staff of the R.N. Diving Magazine on this valuable production.

Having spent so much of my spare time in the Mediterranean diving with the aqualung I found the whole magazine very interesting. I cannot claim to have gone to any great depth, never having exceeded 150 feet but I spent many happy hours at the comfortable depth of 60-80 feet in all parts of the Mediterranean and Red Sea, and have the highest regard for all our divers.

Yours sincerely

Mountbatten of Burma

LETTERS TO THE EDITOR

Dear Lt. Hawke,

I am exceedingly grateful for the contribution of £5 from all Royal Naval Divers, and staff and readers of the *Royal Naval Diving Magazine*.

Will you please convey to all those who so kindly helped to provide this sum, my very best thanks.

Yours sincerely,

A. G. ASQUITH-LEESON,
Lord Mayor.
City Council Chambers,
Portsmouth.

Dear Sir,

You may recall that I was Commanding Officer of HMS *Reclaim* from December, 1950 to September, 1952, and like Will Lawther and Alan Sagar, I left the Royal Navy to join the Royal Canadian Navy. My time has now expired and I have established myself as a civilian consultant in the diving game. One of my first jobs is advisor to the Uruguayan Government on behalf of the United Nations. I leave for Montevideo next week and expect to be down there for between three and six months.

Please pass on my kindest regards to all my old friends in the Diving world, and I wish the magazine every success.

Jack N. BATHURST,
302 St. Laurant Boulevard,
Ottawa 2, Ontario.

Dear Sir,

I feel I must write and tell you how much I enjoy reading your magazine. Although I am not a subscriber, I have in the past been able to borrow quite a few editions, the last one being the June publication.

Being a crew member of a Royal Fleet Auxiliary Tanker sees me in quite a few Naval Ports, so when I found myself in Grand Harbour, Valetta, Malta, I determined to look up the Mediterranean Fleet Clearance Diving Team. However, when I arrived at Manoel Island I found to my disappointment that they were away. Almost next door I discovered the Diving School and noted the well kept flower beds and the huge immaculately polished diving helmets and air pump just outside the door. I came to the conclusion that there would not be much to interest me in such a 'posh' place. How wrong I was. On closer inspection I found about a dozen sailors assembling Shallow Water Breathing Apparatus (oxygen) and their enthusiasm for their training and for the Navy in general seemed remarkable to an ex-army man like myself.

Later in the day I met both Mr. Allen, and Mr. Foster the officer in charge of the School and was most impressed by all he was able to show me.

My ship the *Wave Baron* left Malta next day and sailed for Curacoa in the Caribbean where I am writing this. May I through your columns give my best wishes to all R.N. Divers everywhere, and hope they enjoy good diving during 1957.

ALEXANDER G. BLACK,
Dundee Underwater Explorers Club.

Mr. Black's letter was much longer than this, but lack of space unfortunately prevents our printing more. May I suggest that better an owner than a borrower be, and if Mr. Black will give us the word we would be glad to add his name to our subscribers list ED.

MAGAZINES OF THE ROYAL NAVY

Chats—Magazine of the Chatham Port Division published every two months, price 9d.

Sailor—Magazine of the Devonport Port Division published monthly, price 1/-.

St. Vincent—Magazine of HMS *St. Vincent* published three times a year, price 2/6.

Shotley—Magazine of HMS *Ganges*, published three times a year, price 2/6.

HMS Fisgard—Magazine for artificer apprentices published three times a year, price 2/-.

Live Wire—Magazine of the Naval Electrical branch published three times a year, price 1/-.

Communicator—Magazine of the Communication branch published three times a year by HMS *Mercury*, price 1/6.

Blue Band—Magazine of the Royal Marine School of Music and Royal Band Service, published three times a years, price 1/-.

Navesp—Magazine for all RN Patients and Staff published three times a year by RN Hospital, Haslar, price 6d.

The Thunderer—Magazine of the RN Engineering College published April, July and December, price 2/-.

Globe and Laurel—Magazine of the Royal Marines published monthly by RM Barracks, Eastney, price 1/-.

Also recommended are:—

Naval Ordnance Inspection Journal.

Stand Easy—Magazine of HMS *Ocean* published three times a year.

Navy News—The newspaper of the Royal Navy, published first Thursday each month, price 4d.

OBITUARY

FIVE BELLS FOR CHADS

The news of the sudden death of Lieutenant Colin Walter Chadwick came as a shock to all who knew him. He was in fact the old sea-father of all divers, having qualified diver on the 18th of February 1929. He continued his diving career until a couple of years ago, when he returned from a long journey surveying diving projects in Italy, Greece and Australia. I first knew 'Chads' in 1931. He was then a Leading Seaman Deep Diver, of a comfortable figure, rosy smiling features and the inevitable evil smelling diver's pipe.

His association with famous diving and salvage trials incidents are too numerous to mention in detail, some examples are the training of diviers for 'Midget' submarines and 'Chariots', his efforts with the team for oxygen tolerance, rate of ascent trials, and Helium mixtures. His more spectacular achievements were the *Tirpitz* examination, the *Alaska* survey using 'The Iron Man,' (we had to grease Chads to get him out of it) the survey and eventual recovery of the Comet *Yoke Peter* which crashed off Elba.

Those who had the privilege to serve with 'Chads' in HMS *Deepwater* and *Reclaim* will well remember his 'Snap Fix,' 'Tick Tock,' and 'German Clock Maker,' and vile cocktail named 'Virgins Consolation.'

'Chads' had an amazing memory and gift of repartee; he also managed to feed a whole Ship's Company in the days of rationing by unorthodox but very filling and satisfying methods.

He never had a moment of anger in all his dealings with men, was the ideal messmate, first class host and staunch friend.

W.B.

H.M.U.D.E. CLEARANCE DIVING TEAM, PORTLAND

The present finds us in our ancestral home at Portsmouth, where we are spending a short period on trials work.

Since we arrived, we have been accused of (*a*) Taking a parrot from one of the better known taverns, (*b*) Removing the Southern face of the Guildhall clock, (*c*) Obtaining by false pretences, one 'P' boot and two in number two-way stretch suits.

It can thus be seen that we are at least maintaining, if not improving our already high standard, in fact we are being held as a shining example to the current CDs qualifying course who, incidentally by a strange coincidence have already lost their woollen gear since our arrival.

Seriously speaking, we have found it is a pleasure to be back amongst kindred spirits where our finer qualities are so much appreciated. Unfortunately this has resulted in one of our members being shanghied into *Vernon*;—'Who said the Press Gang no longer existed?' We are sorry to see Jim Cannon leave us and wish him well in his new job. We welcome his relief Leading Seaman Sadler and trust that he will be able to master the intricacies of the 'Cannon special booster pump' which, during Jim's time with us has grown from a 'common or garden' type into a resplendent machine which even carries pressure gauges to give the pressure registered —on the pressure gauges! Our pump can also be used to infuse tea with O_2 and inflate motor car tyres (we have a thriving business in Portland dockyard). When the third gear reverse is engaged it actually acts as a vacuum cleaner—so if any 100 cubic foot bottles are found to be full of fag ends and dust—you know where they came from.

Other changes in the team include the arrival of AB Callaghan who has relieved AB D. Christmas, the latter has left for release and we wish him well in 'civy street.'

So much for the present, the future also holds further changes and it is likely that by the time this is in print, the 'Boss' will have left followed early in May, by 'head serang' PO CDI Christmas, in fact there will virtually be a new team.

Thus it seems appropriate through the medium of these columns to thank all those who have helped us during the last two years, particularly Mr. Syd Enright, Chargeman of the local Boom Defence, the dockyard blacksmith, mine host in our local SDC 'The Jolly Sailor' and members of the British Sub-Aqua Club, Weymouth branch. Our relationship with these and many other local contacts has left us with many happy memories of the Portland and we are sure that our successors will receive similar support and so in concluding Best Wishes to all our friends and Damnation to all our enemies.

Gone but not forgotten,
By those who knew him best,
He took away our tool box,
And left us all the rest.

'SEADEE.'

DIVING, WELDING AND CUTTING APPARATUS

(Part 4)

OXYGEN RE-BREATHERS AND OXYGEN POISONING SYMPTOMS

by MR. V. R. FOSTER

In view of the limited availability of suitably priced High Pressure Compressors for use in filling Aqualung cylinders, many Free Divers outside the Service are hard pressed to pay the relatively high cost—between four and five shillings and in some cases higher—for a single cylinder charge.

Some clubs have tried to answer this problem by pooling their resources to purchase suitable compressors, but initial costs are very high indeed and in consequence most enthusiasts have to rely on commercial facilities to obtain a compressed air charge.

When we consider that a single cylinder of compressed air has a duration of approximately 30 minutes, it is easy to understand why many divers are unable to afford the cost and as a result their submerged hours and diving pleasures are unfortunately restricted to a minimum.

In view of this unhappy state of affairs, many minds are giving much thought to the more economical Oxygen Re-Breather Apparatus, more especially those divers who do not wish to go beyond 30 ft. in depth. It is with these enthusiasts in mind that I offer this short article as a word of W-A-R-N-I-N-G.

Before purchasing Oxygen Re-Breathing Apparatus or building your own set from Government surplus supplies I ask you to give serious consideration to the following facts.

The Oxygen cylinders of Re-Breathing Systems, when fully charged, will have an approximate duration ot two hours. However, it must be remembered that the differential costs in charging for an equal number of compressed air hours will be offset in the cost of carbon dioxide absorbent cartridges. It is also of the greatest importance to be aware that once the CO_2 cartridge tapes or seals have been removed or broken it is unsafe to let it stand and then use the same cartridge at a later date. As most oxygen dives are restricted to 30 minutes' duration this is a waste of CO_2 cartridges. These factors must be foreseen and taken into account when studying the economics of the two systems, 'Compressed Air' v 'Oxygen.'

INDIVIDUAL OXYGEN POISONING SUSCEPTIBILITY

The breathing of pure oxygen in excess of atmospheric pressure is poisonous, and the degree of poisoning varies with different people and the same person from day to day. The accepted depth limit when swimming or doing light work is 33 ft. for 30 minutes, although this does not mean that oxygen poisoning symptoms are not to be expected or experienced in shallower depths and shorter time exposures. Conversely, some people are able to go much deeper and for longer periods before the onset of symptoms, and therein lies one of the most dangerous aspects of O_2 breathing.

Any diver who has been officially trained, and what is more has had the opportunity to observe others undergoing tests and training in the use of O_2 Re-Breathing Apparatus, knows only too well that the reactions of people breathing oxygen under pressure are seldom identical. Bearing this in mind it is obviously most important that your own susceptibility to oxygen should be suitably and efficiently tested, observed and competently assessed before foolishly venturing to the widely accepted depth and time-limit of 33 ft. for 30 minutes when using this type of apparatus under practical conditions.

It is not my intention here to discuss what has already been written on the cause of oxygen poisoning. Indeed the true cause has not been established.

Up to date many experiments have been made and numerous theories put forward. A great deal of inaccurate information has been written and published on the subject which unfortunately can lead to the dangerous confusion of the novice diver or dip-chick. However, the symptoms and effects are firmly established and are in no doubt. I can assure you they are anything but pleasant.

Symptons of oxygen poisoning at positive pressures are nausea, dizziness, twitching of muscles and often, though certainly not always, the muscles of the face stiffen and begin to twitch. (This can lead to loss of control of the mouth-piece and the flooding of the system which in turn creates a further hazard of water contaminating the CO_2 absorbent and giving rise to a particularly active lung irritant, known as 'proto cocktail.') Some people get uncontrollable hiccups, disturbance of vision, irritability, numbness with finally loss of consciousness and a convulsion quite like an ordinary epileptic fit, except that occasionally the muscular contractions are violent enough to break a bone and crush some vertebrae. Before the onset of convulsions, there are almost always vague feelings of discomfort. Unfortunately, certain people often get no warning signs, and sometimes the period of time from initial symptoms to convulsions is quite short—possibly only a few seconds.

ASSESSING OXYGEN POISONING SUSCEPTIBILITY

This is by no means an easy task; the results must never be stated as RULES, only to serve as a guide.

Unfortunately, it is not possible to use the Re-compression Chamber to ascertain what any individual diver's reactions or susceptibility to oxygen poisoning would be under practical diving conditions.

Wet and dry tolerances to oxygen breathing bear no relationship, as the following will show. Simulated (dry chamber) dives using oxygen with the person in the rested state have been accomplished for two hours at a pressure of 45 lb./□″ absolute, equivalent to 66 ft. in depth. Yet the same persons tolerance on an actual dive using oxygen apparatus will be 30 minutes at 33 ft., equivalent to 30 lb./□″ absolute. These facts have not yet been satisfactorily explained.

Obviously then, it is somewhat useless to test your own susceptibility and tolerance other than under practical conditions and then only with a qualified instructor present. It is also equally obvious that it will require many such dives to finalise your own tolerance to any degree of working

accuracy. Considerable knowledge, training and experience, are required in using oxygen apparatus if it is to be used safely. They are not considered safe for the average sports diver; in fact, and quite rightly so, most clubs do not permit their use by members during club activities.

As a point of interest Dr. Hans Haas and his team have always favoured and extensively used re-breathing sets beyond these limits and much publicity has been given to this fact from time to time. However, let us all bear in mind that the late Lieutenant Commander J. H. Hodges, R.N. (Retd.), lost his life wearing this equipment when filming underwater in the Carribean with Hans Haas. At the post-mortem, the cause of his death was not established. One cannot rule out some unknown factor connected with the continuous use of oxygen breathing apparatus beyond the accepted limits.

"OXYGEN PETE" AWAITS BEYOND 33 ft.

Quite rightly, outside of the service the question will be asked, Who is 'Oxygen Pete' and what awaits beyond 33 ft.?

'Oxygen Pete' owes his origin to a Naval rating who was undergoing oxygen breathing tolerance tests during the early part of 1940—by profession he was a boxer. In one of the tests he had an oxygen fit, and whilst recovering from this he asked, 'Who did that?' As he was lying down and someone was wiping his face with a towel he probably thought in his confused state that he had been knocked out. The attendant answered 'Oxygen Pete,' and 'Oxygen Pete' caught on.

'Would-be' oxygen divers were first tested in a chamber—in one corner of it some wag wrote 'Oxygen Pete Sits Here.' If several people had fits on the same morning it was said 'Oxygen Pete's in good form today,' and if one lasted unusually long one boasted of having got the better of him.

I once heard it remarked that, 'No doubt a number of Gods and Devils started their mythological lives in some such way in the past.' Fortunately 'Oxygen Pete' arrived on the scene too late to be incorporated into a religion.

SUMMARY

1. If you wish to dive beyond 33 ft. depth, oxygen Re-Breathing Apparatus is in no way suitable for your requirements and in fact MUST be ruled out.
2. Do not be tempted or persuaded to purchase oxygen equipment until you are sure of your own reactions and tolerence to oxygen breathing.
3. Be sure your instructor is qualified to instruct you in the practical recognition of all known oxygen poisoning symptoms, apart from the proper use and maintenance of the equipment.
4. Above all do not take stupid risks. In view of the many hazards involved when breathing oxygen, NEVER DIVE ALONE.
5. Never be tempted, whatever the prize, to dive beyond 33 ft. on oxygen.
6. This article is not intended to scare or put off divers from using oxygen apparatus, but only to make sure you appreciate and are able to instantly recognise all the KNOWN risks and hazards involved.

To all readers everwhere I wish you many safe and happy diving hours during 1957.

Editor's Note.

This question of oxygen breathing is a much debated one and many Navies will not accept oxygen, but prefer to use only the 'open circuit' sets.

The sets in use in the Service provide a much greater endurance than 30 minutes. Our small Shallow Water Breathing Apparatus uses twin bottles of ·72 litres total capacity, and has an endurance of 81·6 minutes.

The Clearance Diving Breathing Apparatus has a bottle capacity of 3·74 litres and gives an endurance of 3 hours 45 minutes at 33 ft. However the life of the two pound charge of Carbon Dioxide absorbent used is only 90 minutes, and this of course restricts the length of the dive.

The additional endurance however is only one of the many advantages of an oxygen re-breathing circuit, and is perfectly safe as long as the precautions outlined in this article are maintained.

HOME STATION CLEARANCE DIVING TEAM

During the latter part of the year 1956, the movements of the team belied the name 'Home Station'. Having gone serenely on leave from Lowestoft in August, the boys returned to HMS *Dingly* to discover that within a few days the ship was going to be Med.-bound. Can you guess why?

Lieutenant Commander Roberts was at this time relieved by Lieutenant Commander Wilson; PO Lennon (Now 'Charlie,' bless his heart, and congratulations !) had already taken over as CDI; and the rest of the team were Leading Seaman Kissack and Able Seamen Bailey, Burton, Le Cornu, Maynard, McDonald, Pilling, Sparrowe, and Whitton.

We left Harwich on August 23rd with forbidding weather reports ringing in our ears. These were only too soon proved correct, for we had a ghastly night in the English Channel. Our motto was temporarily 'Vomitare Non Desperare,' which means 'The Spirit is Willing, if The Belly Ain't.' We took shelter in Portland for a day. Poor *Dingley* took another severe thrashing on leaving, when we tried going between the Shambles and Portland Race, and our next haven was Dartmouth.

Once we had cleared the storm-tossed waters of the English Channel most of our troubles were over, and we had a fair passage to Malta. What a diving paradise this island provides after the soupy waters of the British Isles ! It is pleasant to recall looking from the bottom at the clear outline of our ship 80 ft. above and allowing one's gaze to follow the lazy curve of the anchor cable, until it was lost in the grassy contours of the sea bed.

Two of the team did some airborne work as well. Burton and Whitton made a 'Free' descent from a cliff-top 80 ft. above the sea. Whitton's entry was a bit off-balance and in a few minutes his arms were a glorious shade of blue !

In October we spent a few days at Syracuse in Sicily and enjoyed some interesting diving. Syracuse seems to have been a veritable graveyard of ancient ships which met their end either through battle or storm. Of the ships themselves hardly anything remains, but their anchors are to be found, and any amount of amphorae, besides other interesting objects.

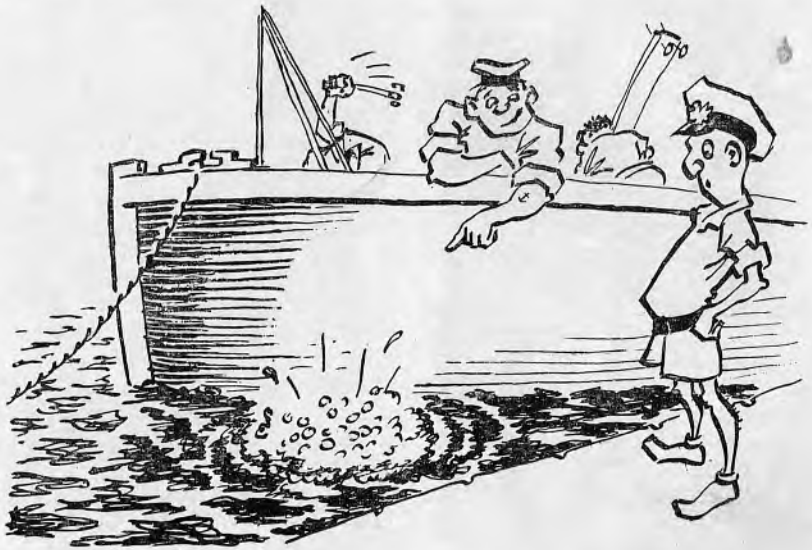
It was intriguing to learn that some of our finds had lain on the sea-bed for as long as 2,000 years.

Towards the end of October *Dingley* started home. She made Gibraltar serenely and undisturbed. The lads were doing their Christmas shopping when the bolt hit them. Out of the blue came news that the Diving Team was being recalled, leaving the ship to continue homewards. Eight days later we were entering Port Said harbour in a Coastal Minesweeper. We had a close view of the Naval bombardment, of aircraft rocket attacks, and of the Royal Marine Commandos being ferried by helicopters. Then we went to work ourselves searching for possible mines in the berths which our shipping was to occupy.

Perhaps the most interesting of our subsequent tasks was the finding and surveying of sunken vessels. Port Said harbour has not got a reputation for cleanliness, but we found it quite reasonable, probably because there had been no shipping traffic through the Canal for many days. Underwater visibility is restricted to about three or four feet.

The Team spent three weeks in Port Said, and was home for Christmas. In January we rejoined HMS *Dingley*, which was patiently waiting for us in Scotland. We are now based on Pompey, and are once again fulfilling the role of Home Station CDT.

There have been a few changes; we couldn't prise Whitton away from the Med. and McDonald and Burton have since left us. Leading Seamen Sharp and Anderson also Able Seaman Lockwood are with us now. We have prospects of much happy diving. Good hunting all! H.T.W.



'We've run out of planks so he is getting some from where it don't show'

FLEET CLEARANCE DIVING TEAM (MEDITERRANEAN) NOTES

Greetings and Salutations from this Mediterranean Island. Much water has passed under the bridge and many 'Make and Mends' have been granted by the Diving School next door since our last epistle to you. For this we apologise and crave your indulgence.

However, readers will no doubt appreciate the fact that we have been otherwise engaged on our lawful occasions in that controversial stretch of water—the Suez Canal. For this operation we were honoured, from the initial assault to some twenty days after, by the presence of the Home Fleet Team and the Clearance Diving Team (Assault). Being our 'Home Ground' we stayed on until the final evacuation.

The official story of the operation as a whole has yet to be written by the talented pen of the historian, but certain points stand out on reflection. Such as:—

(*a*) The first night at sea after leaving Malta and not knowing quite where we were bound for.

(*b*) The arrival off Port Said and transferring to a Coastal Minesweeper for the initial run in.

(*c*) Entering the harbour and deciding that perhaps it was not such a good thing after all to go alongside Navy House jetty because

Med. F.C.D.T. at 35 kilometres from Port Said—El Cap the British and French front line

wrecks blocked the way. (Just as well really, for Navy House held out with fanatical resistance for almost two days.)

(*d*) The thought that apart from the Airborne boys, who landed in their usual manner, and the Royal Marine Commandos, who came in over the beaches, no soldier, waiting in their thousands in troop-ships outside, could enter the harbour of Port Said until it had been pronounced safe by the Clearance Divers.

For the historically minded, never before had Clearance Diving Teams been included in the forces making the initial assault on an enemy port. The 'P' Parties of the last war worked within ports previously captured, and were not, therefore, under such pressure for time.

Lessons learnt under these operational conditions have been passed on and we hope will bear fruit.

For the final evacuation the FCDO was made Beachmaster and members of the team communication numbers. It was on this occasion that we had a friendly fight with the Brigadier in charge of the evacuation in deciding who was going to be last ashore. He had already told the Press that he intended to be, but, by several crafty manoeuvres (known only to CDs) we achieved that distinction. The Brigadier had 'Never heard of anything like it in all his life!'

When you read reports that salvage work on the Suez Canal has slowed down, the following newspaper account of a typical day's work on salvage operations, suggests that this is not altogether surprising . . .

ISMAILIA. Wednesday, 30th January, 1957.

"An Egyptian suction dredger manned by a volunteer crew of students from Al Zifti University, Cairo, arrived unexpectedly in Port Said Harbour this morning. They at once commenced work on raising the hulk of the SS *Zuleika*, formerly the British tanker *Minnie Baldbrush* (3,800 tons). Either through over-enthusiasm or imperfect understanding of the dredger's mechanism, the suction operated in the wrong direction, and the entire crew of students, together with their vessel, was sucked into the submerged tanker and had to be rescued by Venezuelan divers attached to the UN Forces.

Helicopter Assault. Each copter carried 6 Commandos, landing them on Egyptian Army Commando training ground behind deLessop's statue

They at once called upon the Imam El Badli, the Venerable Rector of the Al Zifti University, to declare a jehad (or holy war) against all members of the Canal Users Association.

This brought operations to a stand still, until officials of the Egyptian Suez Canal Authority, hastly summoned by the Governor of Port Said, called a press conference on board the Frigate *Nur-ed-Dedlok*, Flagship of Rear Admiral Aziz. But no sooner had the Governor read a statement denouncing Israeli Imperialism than the vessel developed a list to starboard and sank within five minutes.

It is considered in informed quarters that it will take six months to raise the *Nur-ed-Dedlok*, which contains 5,000 tons of contraband dentist's equipment. Experts think that this may well slow down the task of clearing the Canal as a whole.'

C.D.T.(A) with Egyptian arms discovered in the backwaters of the Suez Canal

Ah well ! ! !

We say goodbye soon to Lieutenant Lawrence who is to be relieved by Lieutenant Honour.. Lieutenant Lawrence had cause for a double celebration at the beginning of the year. He received his second stripe and was awarded a well deserved M.B.E. by Her Majesty the Queen.

Lieutenant Honour is of course no stranger to us, for he was on the staff of NOIC Port Said and many an odd job we did together. I remember our rescuing a fork lift truck that had disappeared over the side of the jetty (together with the Sgt. Major) or taking medical supplies up to the front at El Cap the night before the Paratroopers pulled out, and

getting caught up in Paratrooper hospitality. Taking charge of a Merchant Navy Radio Operator, obviously affected by the local brew, who decided one night to arm himself with a rifle and conduct a one man war against Nasser was another Combined Operation.

Lieutenant White, the Fleet Clearance Diving Officer, Lieutenant Lawrence, The Bomb and Mine Disposal Officer, Petty Officer Norman and Able Seaman Wilkinson have just returned from a flying visit to Tobruk. The local harbour authorities were worried about a couple of bombs they could see near the jetty. A rather nice twin-engined Viking was placed at our disposal and we found ourselves in El Adem in no time. Then followed a long trek through the desert to Tobruk, Wilkinson said his camel acted as if it were wearing MRS boots, and was only stopped in time from lighting a stick of Plastic Explosive at the rear end to encourage movement in a forward direction. The two bombs turned out to be three, together with a collection of 17 oddments. We had to stop at twenty for the aircraft was waiting. Tobruk would make an ideal bomb disposal training ground, for there are countless missiles scattered all over the place. Anybody want to know how to rig a camel as a diving boat?

Petty Officer Tom Norman also says goodbye to us this month, his relief Leading Seaman J. J. Cook is already out here. The loss will be ours—not to mention the Great War Bar. There has been a healthy crop of marriages lately. Those who have succumbed to matrimonial bliss (?) are AB's Graham, Shore and Carter.

Our next trip from these island shores is in March. The FCDO flies to La Spezia via Rome for NATO meeting on Minesweeping. The team will go by sea in HMS *Woodbridge Haven* and her brood of Coastal Minesweepers. We then have a splendid spot of liaison with our Italian chums at their large school in Spezia. This little interlude lasts from the 8th to the 14th of March, when we sail for that colourful musical comedy Principality of Monaco, in time perhaps for the christening. Who suggested a Steamers Helmet as a christening present? Not a word to the firm next door, but there are those that think it might not be a bad idea, after all these years, for them to look at shores other than those of Sliema Creek. If their shaky hands can make out a Next-of-Kin form in time, they may even come with us.

We leave Monaco about the 19th of March then steam hot foot for Malta to prepare for our next big NATO Exercise which takes place at Bizerta in May.

Well friends, enough of this idle chatter—back in the cage—and all the best from Farson's. P.A.W.

NOTES FROM H.M.S. ANNET

Not much news from us this time I am afraid. At the time of writing we have just reached Southampton again after a refit at Chatham. It was rather an inactive period down there, but the 'School' staff were their usual hospitable selves.

Lieutenant Burstall has now left us and we wish him luck in his next appointment. Lieutenant Thorniley has taken over as our new diving officer. With very much regret I must announce that our Captain—Lieutenant Commander Watling is soon to depart, and what with a new First Lieutenant—Lieutenant Dunstan, and a new Sub.-Lieutenant—Sub-Lieutenant Stroud, our officer complement has now been completely changed.

Departures from the team are Able Seaman Webb, to Bomb and Mine Disposal, Scotland, and Able Seaman Stancombe, soon to go to HMS *Vernon*.

The social side of events has been almost non-existent, but we did manage to have a team run to the Central Hotel, Gillingham. A very pleasant evening was enjoyed by all, and I would like to take the opportunity to thank Charlie Cox, Junior (The Boss) for putting up with us and also bringing us back on-board in his van. Mind you, he may have been glad to get rid of us, but it was a very good gesture. I think all behaved in the appropriate manner.

CPO McKinlay kept his New Year resolution regarding not drinking, and never touched a drop until he could get up on New Year's Day.

PO Macrae-Clifton is even more pretty now with a set of whiskers.

NEWS FLASH: Whiskers Macrae-Clifton has had an addition to the family.

Thank Goodness it is a girl, just imagine two Macrae-Cliftons, HELP!

SECOND NEWS FLASH: Able Seaman Sargison is now a member of our team.

SMALL ADDS.

Vacant shortly (we hope). A position requiring one good looking CDI as my relief. Apply in writing (if able) to the Captain, HMS *Annet*. All cheques or money orders must be crossed. Only the highest offers will be considered

MAC.

THE CASE OF THE PARBOILED DIVER

At 37 Yoshis Oyama was a skilled veteran in deep-sea diving. For 20 years he had flirted, unscathed, with under-water hazards, of which the deadliest is the invisible 'bends'—nitrogen coming out of solution in the blood and forming bubbles that cause excruciating pain or paralysis. A fortnight ago, Veteran Diver Oyama met the 'bends'.

From the dinky little salvage vessel *Daiei Maru* (a misnomer, for it means great prosperity), Oyama plunged into Nagasaki Bay in the hopes of salvaging enough scrap iron to make it worth the effort and risk. Four times he went down 192 ft with nothing untoward. Raised to the *Daiei Maru*'s deck after his fifth hour-long descent, he collapsed in pain. His shipmates, unversed in medicine but with a well-grounded fear of the 'bends', slapped Oyama's helmet back on him, stuffed his diving suit with lead weights, and dumped him back over the side—down to 150 ft.—planning a slow decompression.

In three hours they raised him only 50 ft. Then the wind changed and freshened: the *Daiei Maru* had to seek more sheltered waters. And so began one of the amazing treatments in the history of medicine.

Oyama was hoisted up, the ship moved to calmer waters, and he was promptly dunked again in 72 ft. After 12 hours of sitting there on an iron bar, Oyama signalled frantically to be raised: he was chilled to the marrow and had lost the use of his legs. His shipmates took him ashore, put him in a trough used for boiling seaweed, and lit a fire under him. But the air in his suit inflated with the boiling and he bobbed out. So they took him out of the suit, wrapped him in straw, and poured boiling water over him.

Taken back aboard ship, Oyama was dunked again, but an accident made him shoot to the surface like a balloon. A diver on a passing boat recommended taking Oyama ashore and stretching him out, head down, on a steep slope. This too was done. In the next 60 hours, Oyama was alternately parboiled and marinated in the brine of Nagasaki Bay.

By good luck, U.S. Navy radio men had picked up a message about Oyama's plight. The Navy's headquarters at Yokosuka ordered the nearest submarine rescue ship, the *Coucal*, to Oyama's aid. The *Coucal* clipped four hours off her estimated time on a flank-speed, 500-mile run to Nagasaki. It took the sorely tried Oyama aboard, and doctors went with him into the sub's decompression chamber. He spent 38 hours here and breathed a mixture of helium and oxygen to help flush out the nitrogen. At the end, Oyama could stand shakily on one leg, though the other was still paralysed. Said Oyama: 'If I get well I shall go back to diving because it is the only thing I know. But I will only go into shallow water—no more deep diving for me.'

'Nine feet long? You'll be telling me next you have found a mermaid'

AROUND THE SCHOOLS

PORTSMOUTH DIVING SCHOOL NOTES.

There are so many new faces around here now that we are thinking of issuing identity tags. Most of the Suez 'adventurers' are back, and *Deepwater* Ship's Company is at an all time high, not to mention having the Trials Team, Home Fleet Team, ex-CDT (A) and, for some of the time, the 51st CDT around our skirts. We can't see this lasting long somehow, but in the meantime *Deepwater* is beginning to shine.

Speaking of *Deepwater*, she had her first dockyard refit for four years a short time ago, and you should see her bottom now! Certainly life is becoming more comfortable here, with a drying room having been fitted

(that's to keep the Long TAS Course happy) and we have now erected a permanant covering over the quarterdeck to keep off the rain which seems so prevalent in this part of the world.

You can't resist Fate, and as warned in our September issue, 'Dixie' Dean got married during Christmas leave. Now he knows why it's so hard for the rest of us to get a pink ticket. 'Jenny' Jennison followed his example, but he was much flyer, and it has taken the expert investigators of the 'Watch Committee' to find that one out.

Since last we wrote we have had a few changes in the school. Lieutenant Checksfield has relieved Lieutenant Commander Gash who has gone to serve his sentence in Gens, Lieutenant Hawke has relieved Lieutenant Newman and Chief (drive 'em into the ground) Stanley now reclines in the Regulating Office and mutters Maltese imprecations against all and sundry. Lieutenant Newman by the way, started course for CDO but unfortunately became medically unfit, and it is hoped that he will try again next course.

We are happy to report improvements in the messing facilities at Horsea. At long last we are moving out of the Nissen Huts, and the old refrigerator workshop next door is being converted into a comparatively modern and comfortable Mess Hall. We won't know ourselves down there pretty soon.

Everyone got a few extra grey hairs a short while ago, when one of our motor cutters grew legs and walked, and has not been seen or heard of since. For days we ran around in ever decreasing circles, and faced vast quantities of brass over sundry boards and courts of inquiry. In fear and trembling we now await the results. Please, has anyone seen our cutter?

Finally, may I say how much we all regret the death of Lieutenant Chadwick R.N. (Retd). He was admired and respected by all who knew him, and we extend our deepest sympathy to his family at this time. His funeral was held on the 12th of March and was attended by many from the school in order to pay not only their own respects but also the respects of those of you who were not able to be there. P.A.H.

CHATHAM SCHOOL NOTES

Life here has become rather hectic of late, both for 'Corkheads' and 'Tinheads,' things like bombs, foul screws, and a forthcoming 'C-inC's' inspection.

Lt Heatley (SIR) and his crew have been kept busy, in fact at the time of writing, Drain and Harris are digging for a bomb at Thameshaven. Australian subscribers stand clear, they should be there next month!

Unfortunately CPO (Shan) Tuck has departed to Rosyth, but to cheer us up 'Algy' Ware is back in the fold and we shall soon have the Suez heroes in as well. Talking of Suez, the bazaars did disgorge some of my stores, so all is correct once more. PO's Newson, Robinson and Ashton are back in Chatham, the latter being already in the school, relieved aboard HMS *Birmingham* by AB Rafferty. The others will follow shortly.

It's time to depart, so from the Divers at Chats, to all their fellow 'Dipchicks,' Cheerio.

BADGER.

THAT'S CHATS

There's a little Diving Empire, to the north of Chatham yard,
A forgotten outpost of the Diving world,
It's a six day trip by camel, if your tough and really hard,
Or a CD Chief with muscles truly knurled.

At the bottom of our docks and the dreaded Northern Lock,
We've things to make your hair stand up on end,
Man-eating toilet pans, and such, though to us that isn't much,
It's enough to send outsiders round the bend.

To the far North has gone 'Shan', a very deadly man,
Now residing with 'Our Wilbur' in *Safeguard*,
Apart from scream or thud, life here is dull as mud,
But that's only if you're really tough and hard.

Sea dramas are our line, we have them all the time,
But the last one was the finest ever met,
We were chased all up the Thames, by a liner now and then,
And the stem of Tilbury Ferry we've got yet.

There was 'Donkey' Bray as coaxswain, with 'Badger' doing Nav.
And three assorted 'steamers' hanging round,
They'd gone to give a hand to our dear old frogmen band,
Towing 'George' out to the final blasting ground.

After sleeping in the 'Nick,' we found they had the trick,
For this to them we have to raise our hats,
They leapt in off the dock to remove the fuzing block,
So the 'steamers' trundled off back home to 'Chats.'

'DINGER' BELL.

THE RECENT CRUISE OF H.M.S. RECLAIM

With the refit a thing of the past, save the inevitable cleaning and clearing up, the programme for the following several weeks included trials of the winches and grabs and training of personnel.

Before leaving Portsmouth a certain amount of diving was done in the shallow waters of the Dockyard.

On January 21st we steamed for a wreck lying a few miles sea-ward of the Needles. As we made our way along the Western Solent the weather began to deteriorate so that by the time we had reached our objective it was necessary to postpone diving until the weather had improved.

We therefore made for Poole Bay where we spent the night.

It was decided to steam for a wreck placed in conditions more favourable for diving lying in Tor Bay. However, the weather was still poor on arrival so diving was again postponed. Overnight we had the pleasure of the company of some dozen ships, both large and small, all sheltering.

The following day brought an improvement in the weather which enabled diving to begin and our neighbours to depart.

The underwater visibility was excellent and an attempt at spear fishing was made with an improvised spear. It was said that the refraction of the water made the fish seem very large !

After a day spent on ranging trials at Portland we were again steaming westward for Plymouth and arrived after combating a gale and heavy seas. Suffice it to say that it was much more pleasant 'inside' than 'out.'

The following day we moved up river, where after one further move we remained for the next fifteen days lying in the South Dockyard near to Fore St. Gate.

Reclaim has many close connections with Plymouth, so it was not long before local friends were again seen onboard and previous associations were resumed ashore.

We were to receive visitors from HMS *Defiance* who came to see the ship's equipment and our own crew made good use of the Barracks Swimming Baths using underwater gear. This and testing winches occupied most of our time until we made our next move.

On February 11th we slipped our moorings and began to make our way to Inveraray. The weather was peaceful and our speed made good was itself good. We hoisted the sail which is a large grey Bermudan affair and was rigged upon the mizzen mast. The boom of the mizzen, which is the ship's main derrick, rests forward of the mast lying over the boat deck. The topping lift was used to support the luff of the sail, the foot and leach being free. The sheet was then belayed to a ring in the deck and adjusted to give the sail the optimum set.

The chief effect of the sail was to make steering much steadier. The wind was on the port quarter so that our speed was increased a little.

We arrived at Inveraray in the early part of the Morning Watch, and later on may have startled the few persons about when we fired a rocket.

Having moored to four anchors we begun diving in water about 200 ft. deep and later in water about 305 ft. deep.

The launch was rigged for diving and was used in inspecting the moorings of a buoy and in searching for a launch belonging to a local friend.

It was also used to secure a supply of scallops which abounded at hand.

Two persons under training were introduced to delicacy of live scallops.

'You can really have no notion how
delightful it will be
When with one hearty swallow they
are pressed to share your tea.

Oh, note the differance of your guests as
each retains his post
And meekly makes his bow when he's
presented to his host.

It is not every day that we
may find such true support
When dear ones fill us with the sense
of warm inward comfort.'

Perhaps the scallops were better appreciated after being fried in butter !

At deeper depths oxy-helium mixture was used and the air-heater was again tried but did not work very well, since any heat imparted was lost before it reached the helmet.

From Inveraray we made out way toward Fort William, steaming through the Gulf of Corrievreckan just before dawn.

Near the west and seaward end of the narrows a gigantic whirlpool is often to be seen and is marked on charts and maps as such thereby giving recognition to the fact that here is possibly the most dangerous strait in all the wild west coast.

Our echo sounder revealed tremendous contour variation for all the world like great teeth. Here the bottom varies between 50 and 150 fathoms. In one place off Bagh Ban a pyramidal rock rises to within fifteen fathoms of the surface.

In an ancient writing this sea-way is described as 'the confluence of many seas, each pouring itself into the place of the other until they are swallowed down to the bottom and until they form an open cauldron, sucking and disgorging its draughts so that its rearing is like distant thunder.'

Possibly the noise is 'like distant thunder' when one is on the nearby land, but it is a deafening and frightening roar when one is close at hand.

In our case, the seas were calm save for a very slight ruffling of the waters. Calm waters however are far from a guarantee of a trouble-free passage as history has only too strongly emphasised, so that if afterward we were a little disappointed at seeing no vortex there was also some relief at being again a safe distance away.

Our visit to Fort William was entirely social and we may say that a truly fine time was enjoyed by all.

However, inevitably the time of departure came and on February 25th, taking with us happy memories of our welcome, we again got under way.

The day after our arrival in Portsmouth the Officer of the Pakistan Navy who had spent this period with us engaged in diving work paid a visit to Messrs. Siebe Gormans Ltd. before proceeding via HMS *Safeguard* to his home. We wish him every success in the work which he will be assuming in the future. G. A. E. SEWELL, Inst. Lieut, R.N.

Underwater Swimmers' Section

During 1956 over 200 members of the various civilian Sub Aqua clubs visited HMS *Vernon*. The members, taken as a whole, were a very cosmopolitan crowd and ranged from a pretty young lady who has a dive of 170 ft. to her credit, to a middle-aged gentleman, who although a 'dry' member of the club had the ability to organise and was an invaluable man to have. Without exception all the members were infused with the same contageous enthusiasm for this underwater sport, and we, who met them were most impressed by their keenness to learn all they could of the physics and mechanics of diving.

Of course there were the odd few who, in their enthusiastic ignorance, had courted death during their underwater activities. I recall one gentleman who possessed an 'Emmet' looking set comprising a Calor Gas demand valve, RAF oxygen bottle, and reducer, who was happily diving alone breathing unfiltered commercial air. Full marks for enterprise, but in the name of safety let it be tempered with prudence and knowledge.

Many of the clubs we met possessed a technical expert, whose job it was to 'Vet' any home-made equipment before it was used. He was of course, also responsible for the maintenance of the club's equipment. This is an excellent idea and well worth organising if the right technical man can be induced to take the job on. He does not need to be an underwater man, but of course this helps.

The old argument of the relative merits of oxygen and air breathing apparatus was almost certain to be broached at some time during the clubs' visits and good cases were presented by both sides. It was generally agreed that for military purposes an oxygen set was best, but for recreation the air equipment was probably the better gear to use, because of its simplicity in maintenance and operation.

We were often asked by the younger members if, and how, one could join the Navy as a 'Frogman' for their National Service training, and whether their civilian underwater experience would be of assistance to them. Well, unfortunately, not even a 'Regular' can join as a diver; he must become fully trained in a specialised rate first, and this means a period of basic and operational training as a seaman or engineering mechanic. On completion of this training one can volunteer for diving, and if selected for course, any previous underwater experience would be of the greatest value. So if there are any of you who are shortly donning the white round hat and bell bottoms, don't expect to find a nose clip and flippers as part of your issued kit.

Lastly, I would like to say how much we have enjoyed the club visits, and we look forward to renewing acquaintances and making new friendships during 1957. G.A.F.

MINE INCIDENT AT WEST INDIA DOCK LONDON

Copyright

Lt.-Cdr. Gutteridge and his mine

On Friday 25th of January, the Nore Command Bomb and Mine Disposal Officer, Lieutenant C. Heatley, R.N., was called in by the Port of London Authority to examine an object found by one of their divers when looking for an obstruction in the corner of the West India Dock. This object was found to be a German 'G' mine and accordingly HM Underwater Countermeasures and Weapons Establishment team was called in to assist in its disposal.

The establishment's mine disposal team, headed by Lieutenant Commander G. Gutteridge, R.N. (Retd.) arrived on the scene at midday on Saturday 26th. After conferring with the police and dock authorities it was decided to remove two ships which were berthed within five hundred yards of the mine. Lieutenant Commander Gutteridge then dived and inspected the job.

It was found that in its drop from the aircraft, the mine had glanced off the dock wall (the mark could still be seen) denting and tearing the tail dome covering the firing unit. As the mine seemed to us to be in fairly good condition, and a nut came off easily by hand, it was decided to continue with the original plan of rendering it safe *in situ*. This was better than to risk the possible mishaps with their attendant expense, inherent in towing the mine through shallow docks and twenty-eight miles of winding river to a point where it could be safely exploded.

The first dive had started at three o'clock in the afternoon in fine sunny weather, but soon it was raining and blowing, making life thoroughly miserable for the two scientists standing up top ready to give technical advice and the right tools to the divers. The Chief Constable of the Port of London Authorities, although well advanced in years, was always at hand in case anything should be required with which he could help.

Each dive worked out at about forty minutes, by which time new instructions or different tools were needed to complete the job. The divers of the Nore Bomb and Mine Disposal Team and the Clearance Diving Development Trials Team (led by Lieutenant Commander M. Terrell, R.N.) worked in relays.

After some wrestling with splayed and damaged studs, the dome was lifted. This was quite the most tedious part of the whole operation and required frequent resort to that watch-maker's tool, the jemmy.

The unit was easily freed, the leads from the bomb fuse cut, and the unit, gain, and primer removed in one piece.

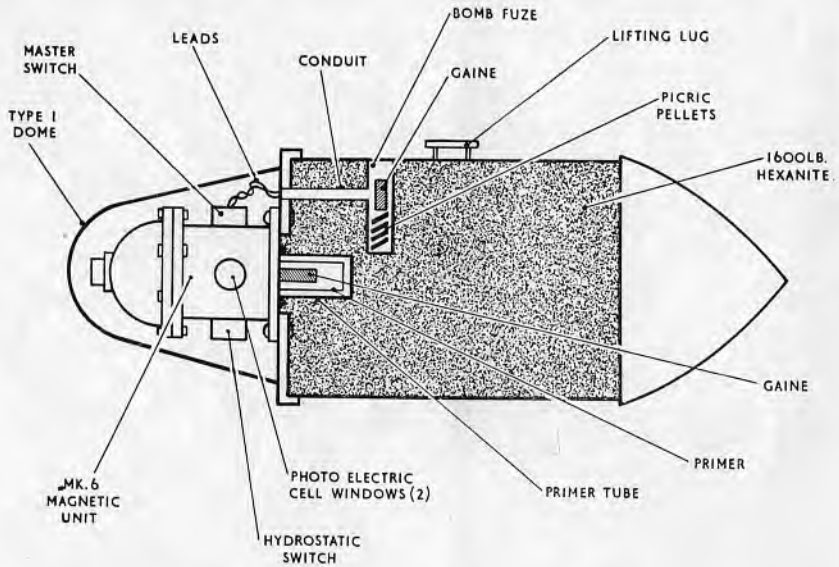
The mine was now safe, but the unit still could not be taken to the surface until the primer tube was removed. Another lengthy struggle was involved in achieving this, but finally the nuts holding the tube succumbed to persuasion and unit and primer were brought up.

In its fall the lifting bar in the mine body had been slightly distorted and the lifting lug would not fit right home. As a result, when the mine had been gingerly manoeuvered close to a bollard prior to shortening the lifting strop from the mobile crane, the grip of the lifting lug failed and the mine fell back into the dock with a resounding splash. Half an hour later it was back again and safely on dry land. The whole operation had taken eight hours.

The next morning the mine body was loaded on to a lorry and taken to the Proof and Experimental Establishment at Shoeburyness where it was exploded on February 6th.

Subsequent examination of the mine unit showed that in striking the dock wall, the unit chamber had pushed slightly to one side, a weight in the magnetic firing device had been displaced, and the latitude correction switch had been broken off. As a result the mine had been desensitised and would have required a comparatively large magnetic influence to fire it during its first few months in the dock. Thereafter, water seeping slowly through the gain screw threads had begun to attack the battery and unprotected aluminium walls of the mine chamber, and by the time it was removed, the mine had become completely inoperative.

This was not known by the Mine Disposal Teams, but it must be emphasised that by taking the mine apart *in situ* the operation was at all times an entirely safe one. Risk of an explosion can only arise if this type of mine is raised or moved before being rendered safe.



Fuzes and Firing Devices. (Booby Traps).

Bomb Fuze—Will fire the mine on impact with the ground.

Magnetic Dip Needle—Will fire the mine if a ship passes over it.

Hydrostatic Switch—Will fire the mine if it drops in less than twenty-four feet of water, or if raised from more than twenty-four feet.

Photo Electric Cells (2 *in No.*)—Will fire the mine if the dome cover is removed in light.

Zus 40—Will fire the mine on removal of the bomb fuze. M.T.

(An interesting job well done—but tell us, have your TV appearances produced any fan mail?—ED.)

CLEARANCE DIVING ADVANCEMENTS IN PORTSMOUTH DIVISION DURING 1956

C.D.O's 11th May

Lt. Bayfield-Davis, R.C.N.
Lt. Morrison, R.C.N.
S./Lt. Lafontaine, R.C.N.
S./Lt. Rowse, R.C.N.
S./Lt. Colwill, R.C.N.
Mr. Heatley, R.N.
Mr. McLauchlin, R.N.

C.D.O's 28th November

Lt. Booth, R.C.N.
Lt. Edwards, R.N.
Lt. Checksfield, R.N.
Lt. Hawke, R.A.N.
Lt. Whatley, R.N.
Lt. Lambert, R.N.
Lt. Thornily, R.N.
Lt. Vincent, R.C.N.
S./Lt. Busby, R.C.N.
Mid. Leckie, R.N.V.R.

C.D.2s. to C.D. 1s.

C.P.O. R. Foord, R.A.N., 31st May
P.O. P. Cobby, 11th May
P.O. R. White, 11th May
P.O. L. How, 28th November

C.D.3s. to C.D.2s., 4th December

P.O. D. Lardner
L.S. A. Strange
L.S. J. Wilson
L.S. J. Sharpe
A.B. R. Andrews

31st August

L.S. A. Drain
L.S. W. Davies
L.S. K. Blaylock
L.S. R. Cobb
L.S. R. Hartshorn
A.B. A. Whitton
A.B. M. Barker
A.B. E. Harris
A.B. C. Gardener

4th May

L.S. E. Spooner
L.S. P. Clark
L.S. R. Sayer
L.S. P. Alderton
L.S. J. Cook
L.S. F. Rose
L.S. T. Malpass
A.B. B. Chaplin
A.B. S. Carter

13th January, 1957

L.S. M. Housden
A.B. C. Wright
A.B. B. Hough
A.B. P. Barrett

'Peasant' to C.D.3

A.B. M. Campbell
A.B. D. Harrison
A.B. A. Barnes
A.B. D. Vaughan
L.S. P. Anderson
A.B. M. Handford
A.B. Wannerton
A.B. C. Burrows
A.B. Lockwood
A.B. E. Mason
A.B. K. MacKenzie
A.B. R. Puilling
A.B. R. Patrick
L.S. T. Kissack
A.B. B. Rogers
A.B. C. Kempson
L.S. D. Roper
A.B. D. Audoire
A.B. A. Sparrow
A.B. J. Graham

STANDARD DIVERS ADVANCEMENT 1956-1957

Diver 2 to Diver 1

P.O. Witherall
P.O. Jenkins
P.O. Bray
P.O. Queripel
P.O. Packer
P.O. Brown
P.O. Semple

Diver 3 to Diver 2

L.S. Owen	A.B. Gilchrist
L.S. Salter	A.B. Butler
L.S. Frankland	A.B. Maloney
A.B. Davidson	A.B. Morris
A.B. Nolan	A.B. Gregson
A.B. Moore	P.O. Robbins

Ratings to Diver 3

L.S. Harris	A.B. Deith
A.B. Hammil	A.B. McNeil
A.B. Allen	A.B. Padgett
A.B. Maltby	A.B. Ansell
A.B. Saunders	Sapper Sawyer
A.B. Clarke	A.B. Goodchild
A.B. Underwood	A.B. Lewis
A.B. Faulkner	A.B. Poulton
A.B. Lees	A.B. Shennan
M.E. (I) Cooper	A.B. Johns
A.B. Perry	A.B. Carpenter
A.B. Holdsworth	A.B. Hadland

PORTSMOUTH COMMAND B. AND M.D. NOTES

It is some little time since a contribution from us has appeared in the magazine, nevertheless we have still been keeping our heads above water, doing the 'rounds' of the South coast ('George' the German mine did not come our way though).

That famous and familiar vehicle, the Heavy Humber has eventually been replaced by a new Land Rover, with a fitted winch, which is a great improvement indeed. We can now feel modernised in transport at last. Road transport is by no means our only method, we have recently had quite a number of trips by helicopter. These craft are invaluable as a time saver where the tides and distance are involved.

One particular instance proved the helicopter's worth when an object was reported on the mud flats five hundred yards from Hayling Island. This object proved to be an 'A' Mk. 10, and it was recovered by means of dropping alongside it on a raft from the helicopter, shackling it on to the winch wire and then hoisting it clear. This was accomplished in less than half an hour.

Most of our time could be spent in chasing all around the South coast collecting individual submarine smoke candles (expended), these have a warning notice 'Do not handle, inform Naval authorities' and naturally the finder has visions of something 'atomic' wrapped up in a cylinder. Luckily we have a working arrangement with the police, they collect them and inform us when they have a set (25).

Some months ago, an empty mine case was located off Hayling Island shore just below low water mark, and required demolishing as it

was an obstruction to small boats. This was accomplished by a couple of fourteen ounce line charges and in accordance with routine 'Sir' waded out to verify the results, loud laughter arose from the shore when he suddenly disappeared from sight into the crater. Quite recently a similar job took place near Weymouth, one line charge was blown near the object followed by two more placed at the bottom of the crater, to blow the remains of the object out. The first charge was exploded according to plan and when AB Rushton waded out to place the second charge he was reminded of the Hayling Island incident and to step gingerly. His reply was 'That's all right Sir I won't do the same as you—I'm too careful for that'—at least that is what it sounded like as he left the surface!!! Luckily he had a dry change of clothes.

These notes are being rather hurried after repeated requests and hints from our worthy Editor, so to prevent them appearing in the 'Stop Press' we in the Portsmouth team extend to all the other commands the best of luck and good hunting.

D.D.

DIVERS'

CLUES ACROSS

1. Contraction, that's what happens when the air is this (10)
8. One on one, an adjective of Greece (6)
9. A light weed could keep the diver down, curiously enough (4, 6)
10. Tendencies to tear in the T.S. (6)
11. Royal Ascot in China? (5, 5)
12. Poor girl, she lost her woollies' (2, 4)
13. Uckers could be loud ashore (4)
15. Hatch fasteners in the right directions make day into night (7)
19. Tramp in a west country river could blow up (7)
21. It sounds a twisty sort of sea bird (4)
22. Reference your attitude, it's restful (6)
25. You'd be disposed of under his hammer (10)
27. Credit can be secured when in a nautical manner (6)
28. Mad lice pit involved (10)
29. To occupy by way of 14 down is different (6)
30. Raid is busy but it could be of secondary importance (10)

CLUES DOWN

1. A suitable remedy for a skin diver when the air is this (10)
2. In time a down could be a field (6)
3. First past the post in the right colour when the clock has stopped (6)
4. Remove the lid from this slipper for two points (5)
5. Did the old time matelot buy this for a song (5, 3)
6. Polite R.N. (anag) so they should be with this around (8)
7. Fifty and send is a British extremity (5, 3)
13. Nancy gives shelter from the wind (3)
14. Did Daniel come to a bad end (3)
16. What the corkheads should be doing, but not where (8)
17. Old ships or older knights (4, 4)
18. Supports instead I estimate (8)
20. At least each 24 hours, it's more than sometimes (8)
23. For a hundred Edward was coerced (6)
24. She was a big shot in the Great War (6)
26. Use slate to make these yarns (6)

NOTES FROM H.M.S. SAFEGUARD

Here at *Safeguard*, the New Year started with great turmoil as CPO. Ware surrendered his valuable stores, etc. (including the desk) during his turnover. The diving staff sent him on his way rejoicing in the good old Scottish style with a 'wee hoot' and a travelling clock. I feel sure that many of the diving world will be sorry to see him leave the Service to try his hand in Canada. We wish him all the best of luck.

Apart from Shallow Water Divers qualifying all is quiet on the Forth except for continuous force 8 gales and Scottish mist.

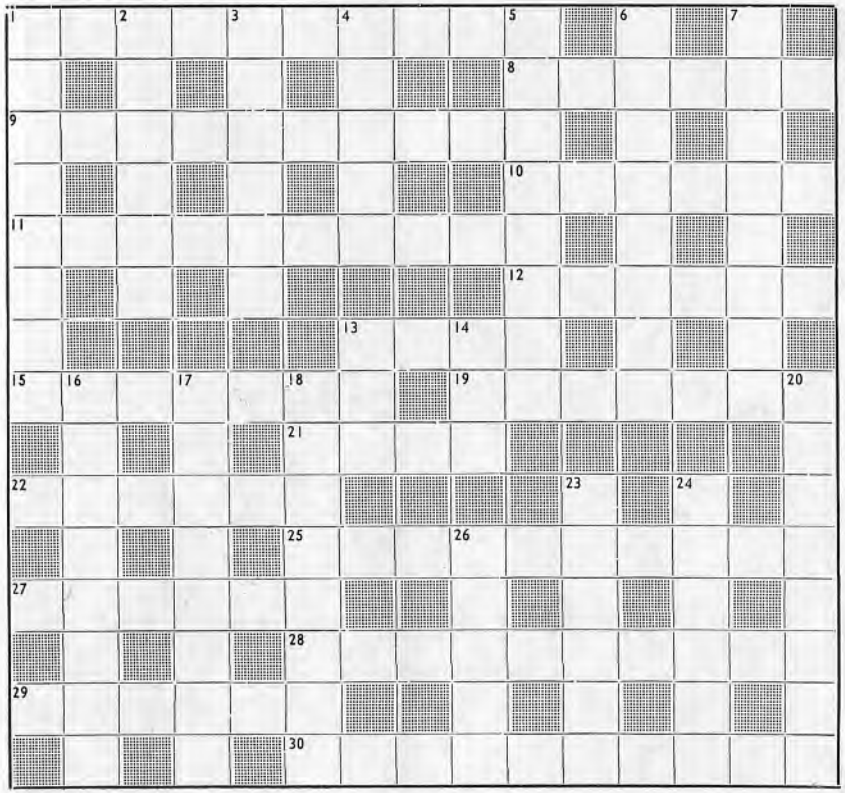
Several salvage vessels have returned from the Suez venture, and needless to say all the heros are 'browned off.'

So from the Highland mists we say *au revoir* and wish all schools the best of luck.

We trust 'Badger' has recovered some of his stock from the bazaars!!

SHAN.

X-WORD No. 3



PHYSIOLOGICAL ASPECTS OF DEEP DIVING

By H. V. HEMPLEMAN, M.A.
Royal Naval Physiological Laboratory

By courtesy of *Journal of the Royal Naval Scientific Service*

Introduction.

Whenever a man's hands and normal mobility are essential to perform a job of work well below the surface of the sea it is necessary to descend into the depths using a flexible suit, where the pressure of the sea water is counter-acted by the pressure of air or other suitable breathing mixture piped into the suit. A man may therefore be breathing a mixture of gases at many atmospheres pressure for considerable periods of time and the physiological problems associated with these special circumstances constitute the main subject matter of this article.

The Problem of 'Bends'.

Consider a man suddenly to be subjected to a pressure of P atmosphere of air and let him stay at this pressure for T mins. The blood as

it passes through his lungs comes into equilibrium with this new pressure of air and carries dissolved gas to all the tissues of the body. As T gets longer and longer, tissues of the body gradually reach equilibrium with the outside pressure of air. It is clear then that at any value of T less than that necessary to satuarate all parts of the body, there is a picture of various parts of the body in differing stages of saturation with respect to the outside air.

At this point let us assume it is necessary to bring this man to the surface, *i.e.* at 1 atmosphere air pressure. Some tissues have almost P–1 atmospheres of excess air to lose via the blood stream, whereas others may only have very small quantities. The moment the outside air pressure is lowered some tissues must inevitably become supersaturated with respect to the outside pressure and there is a risk of bubble formation. The core of the problem of the prevention of 'bends' is to establish what degree of supersaturation various tissues will tolerate, before they commence to give bubble formation.

Established Facts.

i The variables are depth and duration of dive, e.g. with certain reservations it is true to say that a short, deep dive is as risky as a long shallow dive.

ii It is as safe to come from a saturation (indefinitely long) dive at 2 atmospheres absolute to 1 atmosphere pressure as it is to come from a saturation dive at 6 atmospheres absolute to 3 atmospheres absolute. In other words one can decompress on a 2: 1 ratio at any rate for this type of dive.

iii Whenever a diver is brought to the surface without a sufficiently adequate decompression schedule he generally gets a 'bend'. A 'bend' is a pain which is nearly always associated with a joint and is immediately relieved by recompressing the diver.

iv All men can spend twenty-two minutes at 100 ft. sea water pressure and return to the surface at a rate of 1 ft. per second and suffer no 'bends' pain from this dive.

v Whenever bubbles have been produced in mammals as a result of faulty decompression from high pressures of air, then these bubbles on analysis proved to be constituted almost entirely of pure nitrogen. It must be emphasized that bubbles cannot be directly seen as responsible for 'bends' pain. The evidence for bubbles being the cause of 'bends' pain is indirect and rests mainly on observation (iii) namely that re-compression relieves the pain. Thus in order to avoid the 'bends' a decompression schedule based on the above boundary conditions has to be calculated.

Attempted Solutions.

Prior to the First World War various theories and decompression schedules were advanced but none of these succeeded in affording good protection against the 'bends' except in certain specific circumstances. Haldane in 1908 produced a diving table which was based on principles that have proved to be applicable to dives of widely varying depths and durations. Since the introduction of his decompression schedules into the

Navy serious complications from diving procedures have been eliminated. In brief the basic ideas are as follows. It is assumed that the nitrogen content of the blood is at all times in equilibrium with the nitrogen partial pressure in the air which is breathed. It is also assumed that the regions of the body where 'bends' occur contain tissues which behave as though they were well mixed solutions separated from the blood by a thin diffusion barrier. Such a tissue would take up nitrogen at a rate proportional to the nitrogen tension difference between that in the tissue and that in the blood. Therefore for a sudden change in blood concentration of nitrogen the tissue would equilibrate exponentially with time. It is therefore possible to characterize the speed with which a tissue takes up or loses nitrogen by the half-time of that exponential. Haldane assumed the presence of tissues whose half times range from 5 to 75 minutes.

It was also originally suggested that at any depth the quantity of nitrogen a tissue could tolerate was twice the amount of nitrogen which the tissue would contain if saturated at that depth (see fact ii above). To quote an example imagine a dive of 20 minutes duration at 200 ft. depth. Then the 5 min. tissue has reached 187·4 ft. of excess pressure the 10 min. tissue 150 ft. pressure; the 20 min. tissue 100 ft. pressure; the 40 min. tissue 58·6 ft. pressure; the 75 min. tissue 34 ft. pressure. Thus on a 2: 1 absolute pressure ratio the 5 minute tissue will permit the diver to rise to $\{(187{\cdot}4+33)\div 2\}-33$ i.e. 77·2 ft. or 80 ft. to the nearest 10 ft. So after 20 mins. at 200 ft. one can safely raise the diver to 80 ft. at his first stop. At 80 ft. the 5, 10 and 20 min. tissues are all losing nitrogen but the 40 and 75 min. tissues are still gaining. Thus without carrying on with the calculations it can be seen that the early periods of a decompression schedule are controlled by the 'fast' tissues and the later periods by the 'slow' tissues. More recently this simple 2:1 ration has been found inadequate to explain all the other facts of decompression sickness. As a result of a large series of dives performed in the U.S.A. by Hawkins, Shilling and Hansen and by Van der Aue, Kellar, Brinton, Barron, Gilliam and Jones this ratio has been adjusted for each of the various tissues to bring the theory into line with observations. These workers arrived at the conclusions that each tissue should have its own ratio and these ratios varied from 3·8: 1 for the 5 minute tissue to 2·06:1 for the 75 min. tissue. Diving practice on these new Tables has proved more economical in time for most dives but no less hazardous than on Haldane's Tables when long deep dives are performed. Various rules and ratios began to creep into diving practice and a few years ago it became very obvious that owing to the rather arbitrary way in which these re-adjusted ratios were calculated the original theory had lost much of its elegance and plausibility. As a result of this, the Author published a report in which decompression schedules could be calculated from an entirely new theoretical basis. On this theory it is still assumed that the nitrogen content of the blood is at all times in equilibrium with that in the outside air, but the tissue is not regarded as behaving like a well mixed solution separated from the blood by a thin diffusion barrier. Instead the tissue is assumed to allow nitrogen to diffuse slowly through it. For a sudden change in blood concentrations of nitrogen such a tissue would not take up nitrogen exponentially with time. Solving the differential

equation involved in this situation with a number of simplifying assumptions as to boundary conditions, yields an equation with an infinite number of exponential terms. The time constants of these terms vary from very short to infinitely long. Consequently by using a one-tissue hypothesis one reaches a situation analogous to Haldane's original many tissue theory with its associated exponentials. The advantage of this one-tissue idea is that it appears more plausible on several counts. Firstly from the facts given above it is seen that 'bends' pain is nearly always associated with a joint. It seems likely then that only one type of tissue is involved. Secondly, the 'bends' pain is always the same type of pain. On both these facts a many-tissue hypothesis is hard pressed to give a plausible answer. Having decided that there is one tissue only and that the saturation with nitrogen of this tissue follows a certain calculated curve it is necessary to decide what set of conditions within the tissue will lead to a 'bend'. It is the nature of this assumption about which it is most difficult to be sure. Two recent attempts (Crocker/Taylor, and Rashbass) have both failed to stand up to subsequent rigid testing in undersea work.

Some recent successful dives and in particular the world record dive to 600 ft. referred to in a previous issue of *J.R.N.S.S.* were carried out using a schedule calculated from a compromise of the above ideas. Fick's equation for linear diffusion through a homogeneous tissue was used. The precise solution of this equation depends on the geometrical distribution of the capillaries in the tissue and the time course of the inert gas concentration of the blood. The situation was considered as equivalent to a slab of tissue abutting its blood supply. When the inert gas concentration in the lungs changed, it was considered that this change was immediately transmitted to the blood supplying the tissue. In order to calculate decompression tables it is necessary to be able to estimate the quantity of inert gas in the tissue at all stages during the decompression. The rate of inert gas transfer between blood and tissue not only depends upon how much inert gas there is in the tissue but also on how it is distributed through the thickness of the tissue. An example may help to make this clear. Consider the tissue when the diver has been at 30 ft. of air pressure for a long time. Equilibrium will have been reached and the inert gas tensions of blood and tissues will be uniform, and a certain quantity (call it 30 ft. worth) of inert gas will be in the tissue. If the diver now comes to 30 ft. (i.e. stays where he is) inert gas will neither enter nor leave the tissue. Now consider the tissue when the diver has been at 300 ft. under the sea for a short time. In this time the same quantity (30 ft. worth) of inert gas has entered the tissue but will be concentrated up near the capillaries at high tension and only diffusing slowly deeper into the tissue. If the diver now comes to 30 ft., inert gas will immediately begin to leave the tissue because of its higher tension and the quantity of nitrogen in the tissue will fall to less than 30 ft. worth. Ultimately if the diver remained at 30 ft. the inert gas would again start entering the tissue from the blood as the remoter recesses of the tissue began to saturate. The algebraic solution of such problems as outlined above is impossible and consequently resort has been made to graphical methods (Rashbass). A percentage saturation of the tissue with gas versus time graph is accurately drawn from the solution to Fick's equation using the appropriate

much simplified boundary conditions. A dive to D_1 ft. for T mins. would be calculated in outline as follows. The percentage saturation for T mins. is found from the graph, (Fig. 1). This is multiplied by D_1 to give the quantity of inert gas in the tissue, measured in feet of pressure. From this the depth to which the diver may be brought (called his first stop) is ascertained. Now it is necessary to calculate how long he must remain at the first stop to elimate sufficient gas, to permit being decompressed to a second shallower stop. For this purpose it is assumed that a dive to D_1 ft. for T mins. followed by decompression to D_2 ft. is equivalent to a positive dive to D_1 ft. carrying on indefinitely followed T mins. later by a negative dive of D_1—D_2 ft. carrying on indefinitely. That is two step-functions of value $+D_1$ ft. and $-(D_1-D_2)$ ft. T mins. apart. It is thus possible, by superimposition of positive and negative dives and the use of the percentage saturation curve, to calculate the quantity of inert gas in the divers' tissue for any diving routine imaginable. (Fig.2).

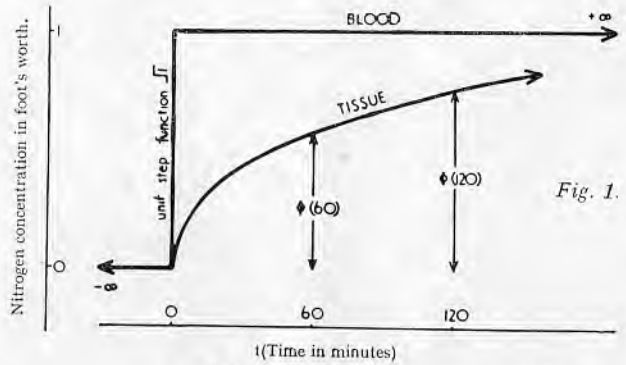


Fig. 1.

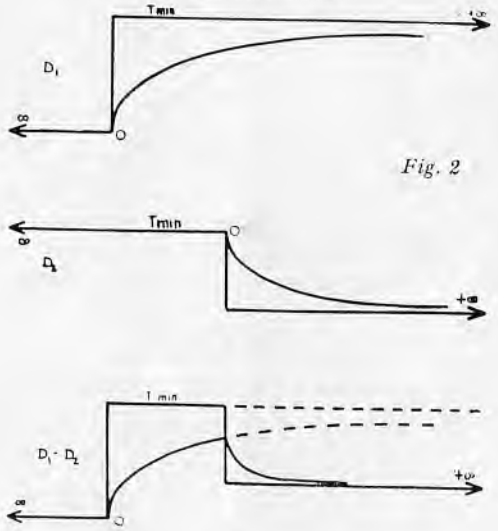


Fig. 2

The Problem of Narcosis.

If a diver is exposed to an air pressure greater than 200 ft. of sea water he will be subject to nitrogen narcosis. This tends to make the diver commit irresponsible acts and his mental processes are very much slowed down. It is known that substitution of other gases to replace the nitrogen will affect the narcosis very markedly. Placing inert gases in order of increasing narcotic action, helium, nitrogen, argon, krypton and xenon there emerges the obvious hypothesis that increased molecular weight (or density) has some part to play in narcosis from inert gases. Other factors however are related to these gases in the order given, for example, solubility of these gases in body fat increases from helium to xenon. As far as is known at present, these gases do not combine chemically, nor exert any physical effect on body tissues other than those obtained from their very small molecular concentration in body fluids. Nevertheless they have quite a marked effect on the higher functions of the brain.

Conclusion.

Outlined above are two of the physiological problems associated with the task of putting a man under the sea in a flexible suit. Despite the lack of a very firm theoretical basis in some of these problems there has been much steady and fundamental progress made in this field. So much so, that on 23th October, 1956, Senior Commissioned Bosun G. Wookey, R.N. descended to 600 ft. below the surface of the icy water in a Norwegian Fiord, performed a useful task for five minutes on the bottom, returned to normal atmosphereric pressure some hours later, none the worse for having had his body subjected to the enormous pressure of over 17 tons per sq. ft. in a mixture of helium and oxygen.

EDITOR'S NOTE—For description of Senior Commissioned Boatswain (now Lieutenant) Wookey's record dive to 600 ft. see our December, 1956 issue.

NOTES FROM THE DIVING ACCEPTANCE TRIALS TEAM

Since the last issue of the Magazine we have 'suffered' a number of changes. Lieutenant Commander Filer has divested himself of his kilt and bagpipe breathing set and has joined the team, complete with bag and haggis, as a relief for Lieutenant Commander Roberts, V.C., D.S.C., R.N., who has taken over the UCWE experimental team, currently residing at Horsea. Leading Seaman Alderton has also rejoined the experimental team, Able Seaman Merrill left to do the post graduate course for Leading Seaman, and Able Seaman Dales has gone on vacation to the Far East. The team now consists of:—Lieutenant Commander Filer, PO Spicer, LS Lusty, AB Chaplin and AB Vanderson.

The new 'Boss' joined at Portland and was despatched to the bottom, inhaling from the 160 atmospheres stored in the Swimmers Air Breathing Apparatus (SABA), within 20 minutes of his arrival. The natty suiting and kid gloved arrival cut no ice, and were soon condemned to the scran bag in exchange for the apparrel befitting the trade. The next stage for SABA by the way will be full acceptance trials, though when that will be

can only be guessed at, as it depends on the time taken to produce the acceptance version.

Whilst at Portland we also played with the underwater sledge and aquaplane which, with negative visibility and comparitively high speed boats, becomes rather more than exciting. This is especially so in the sledge where the controls are shared by two operators. We know from trial reports that no two divers think alike and when one puts the sledge into a power dive just as the other would like to be surfacing, it's positively 'ear splitting'.

Since Christmas leave, we have been involved in a number of miscellaneous trials which must remain engulfed in the blanket of security. Sufficient is it to say that there is ample evidence that development work continues and when you have tasted its products, such as the two way stretch nylon suits, you will be convinced of this.

We were very pleased to hear and observe that our ex-gaffer Lieutenant Commander Brooks is making such good progress and using his indomitable spirit to fight and conquer his severe handicap. PO Spicer is once again diving most energetically, and following the example of his illustrious partner of the Falmouth incident, is not letting it get him down, or should I say 'Is getting down in spite of it.'

I must apologise that we have so little to report this time but we hope to do better in future if we can only pierce the security screen. 'Adios' and good diving to all readers. By the way, have you ever tried diving through the Bumph Barrier?' It's rugged, and stoppage times are excessive !

You may like this one. A certain Chief I once served with in the days when *Deepwater* rolled the Ocean was overheard whilst talking to a group of green faced young sailors, and this is what he said.

'Roll you blighters ! you don't know what it is to roll your inside out, why I was in a ship once when we rolled so much they had to fit spud nets over the funnel to stop the stokers falling out.' B.F.

CLEARANCE DIVING TEAM (AMPHIBIOUS)

The Clearance Diving Team (Amphibious) has now finished its work at Poole and has transferred its functions there to the Royal Marine Special Boat Unit, to whom—Greetings !

Clearance Diving Team (Amphibious) was the descendant of the Boom Defence Commandos of the early war years, and Landing Craft Obstacle Clearance Units (LCOCU) which were extensively employed after the invasion of Northern Europe in 1944. LCOCU's, some of which were Royal Naval units, some Royal Marine, were disbanded after the war and the obstacle clearance task turned over to the Clearance Diving branch under the direction of the Combined Operations (now Amphibious Warfare) organisation, CDT (A) worked at Fort Cumberland, Eastney, until the end of 1954, when it moved with the Amphibious School Royal Marines to Poole.

So ends the life of what has been a very happy team, doing something out of the ordinary run of Clearance Diving. A very close and valuable association with the Royal Marines has also ended, it is good to know that the association between the Corps and the branch still continues in other respects besides obstacle clearance.

We had our last fling as a team at Port Said. After a few days of summer leave, and a pierhead jump for Petty Officer Butler, we sailed from Devonport in *LCT 4039* in the middle of last August. (A few weeks earlier PO Butler had helped to bring the LCT out of reserve !) Thereafter we served in HMS *Ricasoli, Phoenicia, Chailey, Defender, Chaplet, Lofoten* and *Ceylon* in succession, returning to HMS *Vernon* in the middle of December. During the weeks of waiting in Malta, the team enjoyed the hospitality of the Med. team and found diving to be a holiday after the shallow waters of Poole harbour. With the Home station and HMS *Brenchley*'s teams we set off for home in the middle of October, only to be thwarted in Gibraltar and sent back East.

At Port Said the team hit the beach with the Royal Marines just after H-hour, and spent a dusty, noisy pair of hours making sure the Fishing Harbour was usuable by LCT's, then when the Home station and Med. Fleet teams entered harbour we joined them in searching for mines in the harbour. After L-day a multitude of jobs were tackled—clearing foul screws, ships' bottom searches, looking for small arms in abominable backwaters, helping the salvage people and general odd-jobbing—and we came away much wiser men.

Since last August, Leading Seaman Dunbar and AB Audoire left us, AB's Vanderson and Ayre joined, while PO Butler, Leading Seaman Andrews and Baldock, AB's Boyle, Kernick and Tyzack with Lieutenant Parker remained together throughout the wanderings of the team around the Mediterranean. We became experts at going on draft and returning and drawing stores, we were a mystery to most people, and were referred to at various times as CDT (A), FCDT (A), FCD (T), CDT (Assault), and were greeted more than once with the words 'Oh ! But we expected Royal Marines !' We dived from an IMS, and LCA which sank beneath us, a Harbour Defence Launch with a phenomenal acceleration and a tiny, ancient boat we requisitioned which required two strong men and a curse to start it.

This then, is the last from Locku. All the best to all divers, and a fond farewell to Poole.

H.P.

SOLUTION TO CROSSWORD No. 3

Across—(1) Compressed; (8) Ionian; (9) Lead Weight; (10) Trends; (11) Crown Derby; (12) Bo Peep; (13) Ludo; (15) Eclipse; (19) Explode; (21) Tern; (22) Repose; (25) Auctioneer; (27) Triced; (28) Implicated; (29) Invade; (30) Subsidiary.

Down—(1) Coldcure; (2) Meadow; (3) Rewind; 4) Slide; (5) Ditty Box; (6) Interpol; (7) Lands End; (13) Lee; (14) Den; (16) Clearing; (17) Iron Clad; (18) Steadies; (20) Everyday; (23) Forced; (24) Bertha.

H.M.S. DEFIANCE DIVING SCHOOL NOTES

First of all, let me apologise to all 'Janners' for the long silence from the West. It has not been caused as some will have it, by the Admiralty's death sentence being carried out, and although this is still in the offing we cannot as yet see when this is likely to occur. Meanwhile the proposed move into barracks still hangs over our heads, and its immediate effect on life in general and *'Defiance* in particular, is that we do not get any assistance from the dockyard in maintenance work, and we are spared the pleasure (or otherwise) of having loads of dockyard mateys around us. As a result of this we have to do all our bits and pieces by ourselves; our latest effort has been to build a brand new heads block with all matelot labour, the water supply for flushing being supplied from the diving tank. This magnificent edifice was opened with due ceremony, by a Nursing Sister from HMS *Raleigh* on Thursday December 13th, and is now working full-time.

We have been pretty hard hit by 'Drafty' as no doubt most places have, and we are now struggling along on the barest minimum staff. While on this subject, there seems to be a very great shortage of candidates for Diver 2nd Class in the West. The last two scheduled courses have both had no takers and have had to be abandoned, so how about it all you 'Threes' at sea, let's have your 1303's in; it's up to you to do something about it.

At the moment the Diving MFV is undergoing a much needed refit, and as a result 'Taff' Powis may be seen these days walking around most despondently, having lost his command. The proposed completion date is mid-March by which time we hope that we will be able to go to sea again without having the rain pouring in on us from leaky decks.

Life is still very varied down here, one never knows what nationality is going to turn up next with the time honoured request for a monthly dip. We have just welcomed two of our bretheren from the South African ship *Vrystaat*, and have also got two Pakistan OA's on course for Shallow Water Divers, whilst in the present Long T.A.S. Officers course, which we get for their two weeks diving this term, there are two Argentinians, one Venezuelan, two Burmese, two Indonesians, and two Siamese Officers, quite a mixed bag you will agree.

In closing, many thanks to Mr. V. R. Foster, for his most interesting article in the last issue on the 'Air Spaces in The Body and their Effect on Divers.'

Yours aye, A.H.R.

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