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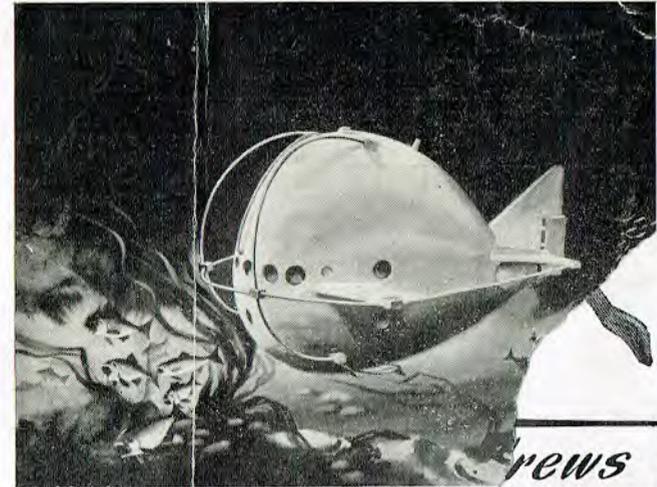
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DIVING MAGAZINE



'MOBELL'—see page 54

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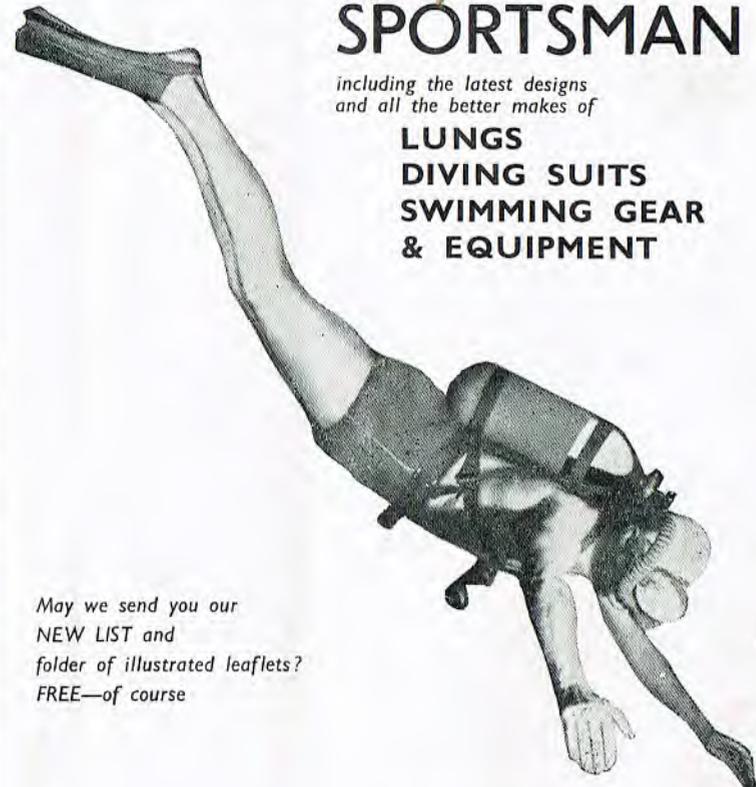
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R.N. Diving Magazine

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Vol. 8

December 1961

No. 3



We Wish all our readers

A Merry Christmas

and

a Happy New Year



The Future of Diving in the Royal Navy

by CDR. J. R. CARR O.B.E., R.N., *Superintendent-of-Diving*

IN my opinion diving should flourish — whether it does so or not depends on many things, above all the outlook of naval divers as regards diving and their other service duties. Diving is an expensive means to a number of ends — it is only going to be paid for if it shows results. We must recognise that we belong to a small navy in which everyone must pay his way by military preparedness. It is no use counting on a few glamorous incidents to justify naval diving and spending the rest of the time having fun with the lobsters. Expeditious achievement of all tasks, particularly the mundane ones, is what will count in the long run.

One implication of the cost is that we can only afford a small branch of full-timers, augmented by a larger number of part-time divers. Now small branches of specialists in any organisation cause administrative problems; any such branch that is not soundly grafted to the naval tree is likely to get lopped off in the testing time of economy. Most of us will remember the flourish with which the Quartermaster rate was introduced but where is it now? Our *corps d'elite* must, therefore, have and hold a place in the service by virtue of being real members of an armed service and not merely chaps who can do things underwater that others cannot do.

With small branches there are two main trends — they can look 'inwards', place emphasis on their 'black art' and cash in on ignorance and credulity: such a branch may achieve high professional standards

for a time but eventually it will decay since externally there is no real appreciation of the worth of its individuals and internally promotion is retarded to 'dead man's shoes'. Alternatively a branch can look 'outwards,' regard its professional expertise as a key to other exploits, encourage the wide practice of its art and always be ready to accept innovations.

I hope that Clearance Divers are adopting the broader view and it is important that they should do so at a time when diving has received good publicity and is generally well thought of. It does involve individual restraints — it means accepting being a part, albeit a virile one, of the larger T.A.S. Branch. It means accepting that Clearance divers should do a fair amount of general service and that while doing this a C.D. can do just as much for his trade as he can while a member of a team. Officers must expect fewer diving jobs (this need not mean much less diving). General List Officers can hope for a 'make learn' job and later in charge of a team but their promotion will depend just as much on their other service work. C.D. T.A.S. Officers can expect even less full-time diving but their influence on naval diving may be greater. The S.D. Officer will probably form the backbone of the branch as far as diving experience is concerned but even he will be judged more as an officer than a diver.

Quite apart from the careers of the full-timers the extent of naval diving will depend on the success of the 'part-timers' — artificer, free and

shallow water divers — in proving the economics of operating underwater. We haven't really started to exploit diving in the field of ship husbandry apart from clearing the odd outlet and undoing wires round screws. The Diving Manuals, going right back at least to the 1936 edition, have contained the illuminating statement 'Practiced divers can work from four to six hours daily below the bottom of a ship and can clean from seven to 12 square yards per hour according to the state of bottom'. Bearing in mind that this referred to standard equipment with all its stages we ought to be able to do at least as much with S.A.B.A. and S.D.D.E. — so far there has been no demand from sea for a suction pad and pneumatic scrubber!

On the sporting side the 'amateurs' — Exped, Medfoba, etc. divers — have their part. The sea may yet prove a better playground than the football field or the cricket pitch.

Provided all these types of diver work together both on the surface and underwater there will be real appreciation of the scope of diving in

the fleet. Diving must then go ahead and it will then only be a matter of waiting until the entire Board of Admiralty is composed of ex-divers of one sort or another.

The importance of retaining the volunteer principle in naval diving is not always appreciated. I am sure it is important and that we shall only lack 'volunteers' if example is bad and leadership is poor because the very challenge of operating in another element calls forth so much that is good in man. On the other hand there must be no stigma on those who fail in courses or decide to relinquish a diving rate. Confidence is essential underwater and it may take more moral courage to admit to doubts and give up diving than to hold on and endanger others for fear of losing face.

A recent naval recruiting poster described clearance divers as 'rather piratical young men' — an apt and complimentary term when read in proper context — but piracy is out of fashion and it is not by privateering that naval divers will flourish.

Sea Food

by J. 'BEATON'—WARNER

'FIRST of all, catch your hare' so says Mrs. Beaton.

From my experience with divers the problem of catching is far less than the problem of cooking. Because of this I think it is time we had a quick look at some of the simple methods of cooking the seafood which occasionally falls into the divers bag.

Lobsters. (Should never be taken under 9in.: when soft: or when full of eggs). Never cook one which has died on you. Bring to the boil a pot of sea water, or fairly well salted

fresh water, put in the lobster and leave for 20 minutes after the pot comes to the boil again. For one over 4lbs. add a couple of minutes extra per pound. Remove from water and allow to cool.

Having cooked your lobster you can then serve it in a variety of ways, remembering that all the meat is edible, with the exception of the feather-like bits which are the gills or lungs of the beast. It is also a good thing to remove the intestine tube which runs through the middle of the tail.

When serving cold with salad, etc., serve all the solid meat in pieces and make a paste with the soft parts using pepper and vinegar to season.

As a change, first boil your lobster and allow it to cool. Then split the beast straight down the middle, remove all the meat and clean the shells. Take all the solid meat from the tails and claws and chop into 'mouthful' size pieces and fill up the two empty half shells and add knobs of butter. Place under a hot grill. When the butter is completely melted and the lobster is heated right through, remove from the grill and cover liberally with grated 'mouse-trap' cheese and a good shake of cayenne pepper. Serve with pieces of fresh lemon when the cheese is well browned.

There are of course many other ways to serve lobster so why not experiment whenever you get the

opportunity. (The raw eggs of a hen lobster are as good as caviar, so the next time you catch one with eggs, why not have a taste before you return the lobster to the sea?.

* * *

Crab. The method of cooking crab is the same as that for lobster but there are different ways of serving. For instance, I always enjoy a crab omelette cooked Chinese style. (Fu Young Hei). Boil the crab, allow to cool and remove the meat. Make a conventional omelette mix and add the crab meat with spring onions, green beans, pinch of salt and a shake of pepper. Serve hot and eat with chopsticks.

* * *

Mackerel. Mackerel should come straight from the sea into the pot. Try boiling one in sea water for about 10 minutes it's delicious.

The more conventional way of

cooking mackerel is to clean and then fry, preferably in butter, but the all important thing is that they must be absolutely fresh. They are also extremely nourishing and very tasty when eaten raw.

* * *

Scollops. Open the scallops with a knife, remove the frill and the black part leaving the large white meat centre and the orange coloured roe. From there every diver knows the drill of using the bottom shell as the cooking utensil and adding a knob of butter and a shake of pepper and

placing on the gally stove for 10 to 15 minutes. There is indeed, no better way of eating scallops because apart from the delicious flavour there is also the atmosphere of a diving operation. However, for those who are lucky enough to take some home I can recommend the following method:—

Clean and remove from the shell, cover with beaten egg and bread crumbs seasoned with pepper and salt and fry in butter. Serve with thin brown bread and fresh lemon pieces.

Macmemo

THE CALL OF SHETLAND

*The Hjaltland sprite is a mermaid fair
And she sits in her rocky hall.
One can see the sheen of her locks gold
green
And can hear her siren call.*

In the last issue of the DIVING MAGAZINE one of the cartoons showed a mermaid being pursued by two divers. In view of this, it is thought that the following article might be of interest and perhaps goes to show that 'Truth is Stranger than Fiction'. The article is published by kind permission of the author Mr. J. J. Laurenson of Fetlar, and by courtesy of the *Shetland Times*. Incidentally, one wonders if all this talk and cartoons about mermaids is the sequence of a recent alteration and addition to the underwater swim suit. It is important that any diver on sighting a mermaid should note whether or not she is wearing a yellow golliwog. (Reference Home Station Clearance Diving Team).

* * *

DID THE MERMAID EXIST?
(from J. J. LAURENSEN, FETLAR)

Did the mermaid exist? The ancient mariners and fisherfolk be-

lieved it did. But with the advent of enlightenment it passed on to what it is now — a fabled sea dweller with the upper body of a woman and tail of a fish. However, the account that follows is interesting, in fact we may have something here that may prove that there may have been some form of being like a mermaid but now extinct.

The account was found by Lady Nicolson among the large assortment of papers and documents at Brough Lodge. I am indebted to her for letting me take down a copy and to have it published if desired. It is in good clear handwriting and believed to be that of Arthur Nicolson, of Lochend. As it is written before he became a Baronet, and after being made a J.P. we think the date of writing the article may be about 1823.

It reads as follows:—

'In the presence of Arthur Nicolson of Lochend, J.P. Compeared — William Manson, Daniel Manson, John Henderson, residing in Cullivoe in the parish of North Yell, who being solemnly sworn, depost — That, in the beginning of the month of July last, they were at the deep sea

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fishing from 30 to 36 miles from land, and about midnight took up a creature attached by the back of the neck to a hook, which was about 3 feet long, and about 30 inches in circumference at the broadest part, which was across the shoulders. From the navel upwards it resembled a human being — had breasts as large as those of a woman. Attached to the side were arms about nine inches long, with wrists and hands like those of a human being, except that there were webs between the fingers for about half their length. The fingers were, in number and shape, like those of a man. The little arms were close on the outside of the breasts and on the corner of each shoulder was placed a fin of a round form which when extended, covered both the breasts and arms. The animal had a short neck, on which rested a head, about the length of a man's, but not nearly so round, and somewhat pointed at the top. It had eyebrows without hair, and eyelids covering two small blue eyes, somewhat like those of a human being — not like those of a fish. It had no nose, but two orifices for blowing through. It had a mouth so large that when opened wide, it could admit a man's fist. It had lips rather thicker than a man's, of a pure white colour. There was no chin, but they think the lower jaw projected a little further than the upper one. There were no ears. The whole front of the animal was covered with skin, white as linen, the back with skin of a light

grey colour like a fish. From the breasts the shape sloped towards the tail, close to which was only about four inches in circumference. The tail was flat, and consisted of two lobes which, when extended, might be six inches together in breadth, and were set at right angles with the face of the creature: it resembled the tail of a halibut. The animal was nearly round at the shoulders. It appeared to have shoulder bones and a hollow space between them, like a human being. The diminution of size increased most rapidly from the navel which might be nine inches below the breasts. There was between the nostrils a thing that appeared to be a piece of gristle about nine inches long and which resembled a thick bristle. There was a similar one on each side of the head, but not quite so long, which the animal had the power of moving backwards and forwards, and could make them meet on top of the skull. When the men spoke the animal answered, and moved those bristles, which led them to suppose that the creature heard by means of them. They did not observe what sort of teeth the creature had, nor the parts of generation. There was no hair upon any part of its body which was soft and slimy.

There is an old opinion among fishermen that it is unlucky to kill a mermaid and therefore, after having kept it in the boat for some time, they slipped it.

All which is truth, so help them God.'

The Second Twelve Months

by HARRY WARDLE

I write now as a hardened Civilian Diving Contractor, with a whole year's operations behind me, and, talking about 'behind', a few of the pounds left in Scotland have now

been replaced. You will gather therefore, that as far as physical effort is concerned, going back to my first love has been easier on the constitution.

Much has happened in the first

12 months, and to put it all down would outlast my allocated 'office hours'. Briefly, however, with the tremendous advantage of being attached to a Civil Engineering Contractor we have made considerable headway. Home support is strong with all the young typists being put out of routine every time the divers return to base. Having a few young virile divers around seems to have helped feminine morale at least; they haven't got round to training the girls how to patch suits, though I feel it is only a matter of time. For the sake of continuous good relations with the engineers, apart from anything else, it is essential to keep the divers out on a job. It is wonderfully peaceful at the moment with the team bunging up cracks in a dam in Scotland.

We are now up to 'Unit Strength', one Ex-Diving Officer and five ex-ratings, remember a C.D. saying 'Too many chiefs and not enough Indians' well I am doing my best to be the only chief, but with Bob Linscott saying 'You can't do that', and the divers coming out with helpful comments such as 'You shove off, we'll get on with it', I sometimes wonder!

The team now consists of Bob Linscott, 'Pat' Patrick, Colin Holdsworth, 'Spadge' Sparrowe and Bill Bailey. 'Barney' Barnes was with us for about three months but he has now left to make his fortune in Kuwait. In Australia we have an ex-Aussy C.D. — C. H. Dieben who is doing fine work in Hobart. You will gather from the above list that we are a diving force to reckon with, so, if any planner is depressed about the diving strength of the Navy, not to worry, you have the Reserves!

Our principle form of transport is a 15cwt. van appropriately painted red and white (diving flag colours, in

case you don't know) in spite of 'divers driving' it still survives, a few souvenirs, of course — a dent in the headlight where a large cockerel decided to take off in front of the van; a bend in the ventilator on the roof which we succeeded in doing with three coxswains conning the van into a hotel garage at Strathaven, etc.

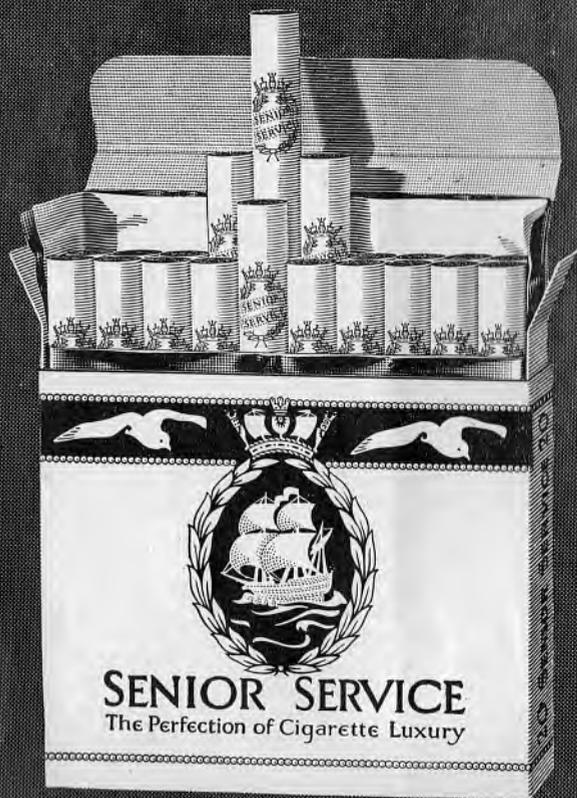
Regarding Diving equipment we have a bit of everything. Siebe, Hienkie, Skinners, etc., even some U.S. Divers, all air systems of course with surface air supply. Demand valve system very popular.

We do a medical every six months and our appointed Doctor is Dr. Nellie . . . We were a bit worried about a lady looking at our 'nellies' but fortunately for us (or her) she has a male colleague.

Work has had its frustrations, swimming around in beautifully clear water with half a dozen large salmon, under the watchful eye of the water bailiff, proved most galling. On the lighter side, cruising around Hampshire's more isolated villages looking for out-of-the-way bridges was very pleasant, whilst lunch-break in the country pub, talking farmers' language was fun. I now know that a heifer is not what I thought it was.

On short jobs we normally stay in hotels, the Landlords practice of ensuring that the only warm room in the house is the lounge removes any hesitation we might have on entering the bar sharp at six, a quiet evening is therefore difficult to achieve. Odd as it seems to us, the locals come from miles around to meet these queer people 'the divers' An expected peaceful three weeks in the backwater of Bradford-on-Avon last month proved anything but peaceful. The Sister at the local hospital assisted putting a stitch in Wardle's hand started another round

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of social activity which didn't help the patient I'm afraid.

The only really quiet place we have worked is on Lismore, an island opposite Oban, no electricity and no Pub. The excuse for a run ashore was to plug in for a shave, as opposed to the more usual excuse, this proved a most popular move with the other

'Island' residents on a run ashore. Plugging in stopped the proprietor's electric clock so all hands had a half hours extension, before this was spotted. As we had the Coxswain of the ferry with us all was well.

1962 looks like being a promising year for us as I hope it will be for all the diving fraternity.

Reversed Ears

by SURG.-LT. A. S. JARRETT, R.N.

'REVERSED EAR' has been a topic for argument for many years. Everyone has had his own opinion, and terms like 'ear seal', 'burst ear drum', and 'suit inflation' have spattered the discussions, and some have even argued whether the injury occurs on the way down or the way up. Now there is a well-tried method for dealing with situations like this:—

- (1) Find out what the facts really are.
- (2) Think up an explanation to fit the facts.
- (3) Think up an experiment to test the explanation.

What the Facts are:

This section is based on the study of 14 cases of reversed ear seen in H.M.S. *Vernon* last year. The ear drum is never involved. The basic injury in reversed ear is bleeding under the skin of the external ear canal. This starts off as little bright red spots of blood under the skin, these may join up to form quite big patches of blood, and then these may fill up to form blood blisters which may swell up till they almost block off the whole ear canal. The last stage is the bursting of one of these blisters — and that is when blood is first seen on the outside of the ear or on the pad inside the hood. A burst

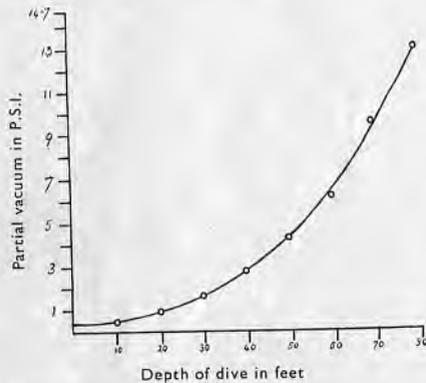
blister leaves a raw patch which will heal in a few days provided it does not become septic. At *Vernon* we were lucky as none of the cases became infected, but the risk is always there.

The Explanation:

Every diver knows that a dry suit develops a partial vacuum inside while diving — invariably the first action on leaving the water is to break the face seal to let a rush of air into the suit. This partial vacuum must be considered as a possible cause of reversed ear. It's most obvious effect will be to suck the drum outwards, but this is harmless anyway, and could never cause the damage seen in reversed ear. But there are other rather more complex effects arising from this partial vacuum. The aim when diving is to keep the whole body at ambient pressure all the time, and of course the 'whole body' includes the blood pressure. When diving at 30ft. your blood pressure is roughly 15 psi higher than it is on the surface. This normally makes no difference as all the blood vessels are supported by the extra 15 psi of the water pressure. But inside a dry suit, and that means under the wrinkles and inside the ear canal, there is a partial vacuum and therefore the blood vessels are not

supported. The increased blood pressure finds no resistance in these areas and blows up the blood vessels until they burst. The result: red marks under the suit wrinkles, and reversed ear, if the partial vacuum was too much for the stretched blood vessels.

This is a reasonable explanation but requires two checks: (1) measure the partial vacuum inside a dry suit; (2) see whether this degree of negative pressure will in fact produce a reversed ear.



The Experiments:

(1) A pressure gauge was adjusted to read negative pressures and attached, via the suit inflation connection, to a dry suit. The Bourdon tube was exposed so that the gauge would always record the difference between the ambient pressure and that within the suit. The diver in this experiment wore, for the protection of his ears, a neck seal. Four dives to 80 feet were made in an open diving bell, in which the diver was submerged to the neck, and every 10 feet the partial vacuum in the suit, as recorded by the gauge, was noted. As the depth increases the partial vacuum increases, and is almost minus one atmosphere at 80 feet. (In other words, while the water pressure is about $3\frac{1}{2}$ atmospheres absolute the

pressure in the suit is about $2\frac{1}{2}$ atmospheres absolute).

(2) The next step is to apply this pressure to the ear to check that it does cause reversed ear. This has in fact been done on two occasions. The details need not be given here, and can be looked up in the British Medical Journal by the misguidedly keen. It is enough to say that on two occasions a partial vacuum which would occur in a dry suit at 30 to 40ft. has been actually seen to cause a complete sequence of reversed ear damage.

Conclusion:

Reversed ear is a 'squeeze' of the external ear canal, and arises because the pressure within a dry suit is always less than the water pressure. In fact the whole suit forms an 'ear seal'; if a small, direct seal does form immediately over the ear this will make matters worse, but is most definitely not found in the majority of cases of reversed ear.

Action:

The following is an extract from a report from the Superintendent of Diving to the Director of Underwater Weapons, dated 31st May 1961.

'16.' Based on these considerations Superintendent of Diving now recommends:—

(a) That neck seals with wet hoods should become the standard underwater headgear for all Naval underwater swimmers and divers.

This will involve:

(i) Increase in the allocation of neck seals A.P. 8580 to drawing D.P. 1244 to cover all types of diving. It is suggested that initial allowances should be based on the present establishments for 'C' type hoods,

(ii) Introduction of foamed neo-prene sheet, adhesive and patterns for ship's divers (S.W.D., Free Divers and Artificers) in addition to Clearance Divers. It is suggested that a ship carrying six S.A.B.A. should be allowed an initial supply of eight neo-prene sheets and four tubes of adhesive."

Comment attributed to Surg.-Lt./Cdr. Mackay

As a guide to divers, a love-bite is a form of squeeze due to pressure of $1\frac{1}{2}$ to 2lbs. per sq. inch and though the experiment talks of 30 to 40ft., less than 10ft. can produce enough suction to produce bruising in the ear.

Cor! we always thought that 'reversed ears' was the result of too much back-chat!—EDITOR.

Portsmouth Command B. & M.D. Notes

SINCE our last article things have been fairly quiet as regards B. and M.D. work, our most interesting job being the disposal of a German Mine Type GU trawled up by the Lowestoft trawler *Unda* south of the Dogger Bank. The explosive filling of this mine was rather unusual, as it consisted of very small blocks of 60% H.N.D. x 40% T.N.T. (H.N.D.—Hexanitrodiphenylamine).

Since then our main occupation has been dealing with shells ranging in size from 280 millimetre ($10\frac{1}{2}$ in.) to small 2-pounder, and found in a variety of places such as, Stiffkey (Norfolk), Alderney, Kimmeridge Bay (Dorset) and some on our own doorstep in a housing scheme at Stamshaw. Another interesting but unpleasant task we had was the clearance of an old water tank in Alderney which had been used by the Germans as a small arms magazine. In addition to about 5,000 rounds of '33 there were 60 stone bottles containing some very strong tear gas,

the whole being mixed in two feet of slimy black sludge. We have also disposed of three 'B' Type 'C' Mines, two at Deal and one at Mundesley, the latter having been found eight feet under the sand by the Royal Engineers. This troop of R.E's at Mundesley are performing a Herculean task as they have been clearing the minefields there for eight years. The job of locating them is becoming more and more difficult as it is suspected that after 21 years some of the mines have become polarised and hence do not give a good reading on the locator.

This concludes the news from the Portsmouth B. and M.D. Unit which is staffed by Lt.-Cdr. Mac, A./P.O. Brassington and A.B. Fowles (Brum), the latter is about to be shipped East of Suez where it is hoped he will be able to raise a thirst, and perhaps even some cigarettes!

Yours aye,

MAC.

A JOB FOR THE 'WRIGHT' TYPE

ARE you leaving the service soon? Are you approximately 25 years? Are you a batchelor for some time to come? Can you go 'dry' for as long as work lasts? Then the following would like to talk business

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Search and Recovery of Crashed Aircraft

by S./LT. JOHN HILLMAN

AT 2100 on Friday 1st July, the Port Diving Officer received orders from the Base Operations Officer, to proceed with team and equipment to H.M.S. *Barbican* at Belfast and to arrive by 0700Z the next day to assist in the recovery of a crashed *Sea Venom*.

This meant the stripping of diving equipment from diving launch for transfer by road. At 0300 Saturday 2nd July, the team with full equipment for two standard divers, and Portable Air Compressor, proceeded to Belfast arriving at 0600.

Before *Barbican* sailed for the buoyed position of the crashed aircraft, the diving team were taken to the R.N. Aircraft Yard, and briefed by technical Officers on the main points of the aircraft including the engine lifting bolts, and the stronger parts of the air frame, then shown these in an identical aircraft.

At 0943 *Barbican* anchored with stern clump as close as possible to the buoyed position, and diving shot rope lowered. Diving operations had to be carried out from the stern of *Barbican*, as no other suitable diving platform was available. This caused some difficulty getting divers in and out of the water due to the stern freeboard.

Diving commenced, and the diver (Able Seaman P. Hayward, Diver 2nd Class) bottomed at 1020 in 38ft. Immediately he reported that he had bottomed in the middle of a mass of wreckage, and was instructed to carry out a survey.

The diver identified the wreckage to be the engine, both wing sections, and a mass of electric cables and

instruments, being the remains of the cockpit. Only one member of the aircrew was reported being sighted.

It appeared from the divers' survey that the aircraft was lying in an upright position giving access to the engine lifting lugs, and engine main bearers, although the latter are slightly more inaccessible. The diver was instructed to locate either of these.

The engine lifting lugs were located and the diver was passed a two legged sling which was then attached to both lugs. A 4½in. lifting wire from *Barbican's* after winch was passed to the diver to secure to the ring of the two-legged sling. This proved a difficult operation for the diver due to the weight in the length of wire required to reach him, as he was at this time some 50 to 60 ft. out from the ship's side, and after numerous efforts this was eventually achieved. The weight of the lift was just taken and the diver surfaced and brought inboard.

As soon as the diver was clear, lifting on the after lifting wire was carried out. This had then to be transferred to the forward derrick, so as to hoist wreckage inboard. It was not fully realised how much of the aircraft was being lifted until it was hanging from the top of the derrick hoist, when it was estimated to be a large portion.

After some anxious moments, when it was thought that everything would part, gentle handling and good seamanship proved successful as it was lowered onto the foredeck.

The body that was reported by the diver failed to appear and was pre-

sumed to have fallen off during the transfer.

The technical Officers assessed the amount to be approximately 80% of the aircraft. This consisted of:

1. Engine — type Ghost with one tail cone
2. Wings—Undercarriage housed
3. Tail booms — rudder and fin missing from one
4. Remains of fuselage, various instruments and controls
5. Miscellaneous wooden parts of fuselage.

There still remained:

1. Aircrew and ejector seats
2. Tailplane
3. Wing tip tanks
4. Tailcone
5. Radar nose cone
6. Radion set (APX6)

On return to harbour at 1725, divers were again taken to the R.N. Aircraft Yard, where they were familiarised and briefed on the operation and safety arrangements of the type of ejector seats fitted, for although the ejectors seats were loaded and not fitted for underwater ejection, there remained an element of risk to the diver.

On Sunday 3rd July, diving commenced at 1030, and using *Barbican's* clump anchor as a shot, a systematic search was carried out covering the wreckage area, in two diving periods

between 1030 and 1530. The tailplane, wing tip tank, tailcone and various odd instruments were recovered, before diving was suspended because of tidal conditions at 1530.

It was decided to recommence diving at 1710, using *Barbican's* own diver, as all of Londonderry team had already dived. On the first sweep of this systematic search the diver reported the discovery of the aircrew, complete with ejector seats.

At this stage the diver requested permission to surface, for it was apparent that he was distressed from what he had seen. This was only granted after he had been instructed to secure the end of his distance line to one of the ejector seats before returning to the surface.

Hayward already dressed as Stand-by Diver volunteered for the unpleasant duty of recovery. On arrival at the bottom, the diver reported that he thought no attempt had been made to eject, as both seats had not fired, although the Droge gun on one seat had fired, but this was assumed to have fired on impact. A line was passed and secured through both seat harnesses, which were then hoisted inboard. Returning to his shot the diver recovered the radio set, and on surfacing at 1810, diving operations were completed.

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ditions, team work, and the detailed familiarisation of an identical aircraft, greatly contributed to the success of the diving side of this operation, which although it did not pose any unusual professional difficulties, was certainly an extremely unpleasant task.

On 26th July 1960, on behalf of the

Port Diving Unit, Londonderry, the creditable work carried out by Hayward during the operation, was awarded Commander-in-Chief, Plymouth's 'Commendation for Good Service' which was subsequently presented to Hayward by Captain E. N. Sinclair, D.S.C., Senior Naval Officer, Northern Ireland.

Medical Notes and Comments on Diving Accidents

SURG./LT.-COMDR. D. E. MACKAY, R.N.

IN the past four years I have come across many different kinds of accident arising from man's desire to go underwater or up in the air. There are many lessons to be learnt—and I hope I have learnt them—so I thought some annotations would be of value. Let me make quite clear that these are my own views and opinions. Of course, I think they are sound, practical and reasonable, and anyone else would support and agree with them, but in this article I represent only myself. Before starting however, there is one very important point to emphasize and that is that the risk of an accident—let alone a serious accident—is negligible where common sense and sound training are allied. There are many thousands of dives carried out under R.N. auspices each year but the accidents barely run into tens.

Fatal Accidents

There are two kinds of these accidents that I would like to mention—medical, and diver's own responsibility. For many years, it has been known that an apparently fit young man may drop dead in his tracks, say on a route march, or, potentially more disastrously, at the wheel of a vehicle, and the coroner reports natural

causes. These causes may be a heart attack—much more common in the older members of the population but not unknown in the younger—or heart failure from an infection such as certain kinds of pneumonia. It must be expected that sooner or later, these things would strike a man who happened to be diving. As these possibilities cannot always be foretold after the most rigorous of medical examinations, a balance must be struck on practical methods of examination and the chances of such accidents. It is obvious that an infection which is fatal in three to four hours may defy discovery and treatment if the victim does not report sick—even if he had been examined six hours before!

About the second kind, one must always remember that water is not the natural surroundings for man and should be treated with respect at all times. Amongst accidents I have known bottles not to be turned on; main bottles to be empty but the emergency bottle untouched; and the face mask and mouthpiece removed at shallow depths. The extra tragedy with this kind of accident is that the reason for such apparently stupid actions is never found and steps to

prevent a similar accident cannot be taken.

There is one common thread to the above accidents and that is the inexperience of the divers. Just because a motorist has passed his driving test, he is not therefore a good driver, in the same way because a diver has qualified for his daily rate, it does not follow that he is an expert diver, or behaves like one, or should be treated as one. I don't subscribe to 'the *only* good diver is an old one' but I do agree that 'you can't be a good diver on just a monthly dip'. Hours and hours of actual underwater experience are essential.

It would be simple to use lesser degrees of the preceding accidents as a link between fatal and serious accidents but I think free ascent is better as an example. In this country, there has not so far been a fatal accident in training in free ascent but this has not been the experience abroad. The main reason has been that here, training in this psychologically peculiar idea of not wanting to breathe-in underwater is carried on within reach of a recompression chamber — and within reach means a time interval of, seconds rather than minutes, and not just distance. Once trained, it is expected that the dangers are decreased but at all times the method is potentially serious in that trouble may result in spite of correct drill in an apparently fit man, if there is any cause preventing free expansion of air in a man's lung. The Submarine Escape Training Tank at *Dolphin* has most cases arising in this country — roughly one in 3,000 ascents but as they consider 20 *seconds* as being *slow* in starting treatment, the chances of trouble persisting are less than those of winning a treble chance. In at least two fatal accidents, pressure was

applied about five minutes after the first signs appeared but this was too long. Similarly the pressure must be adequate — that is 165 feet not just 65 feet. This type of accident may also happen to aviators and the treatment is very similar.

Serious Accidents

Although accidents in free ascent could well be fatal, the happier outcome is due almost always to adequate treatment. There are other serious accidents where, however, treatment may or may not be needed. By this I mean that being able to get the diver ashore and remove his breathing set may be quite adequate treatment or the effects of the accident may require life-saving treatment. To illustrate this, a diver is mistakenly given an air set where the bottles are accidentally filled with, say, pure nitrogen. He will lose consciousness — a very serious accident — but landing him and taking off his set will lead to rapid recovery. If, however, while he was unconscious, he inhaled water, then he would need to be treated for drowning and the actual cause of his accident can be ignored till he is revived. Such accidents involving lack of oxygen for one reason or another do occur in civilian and service diving. A report reissued in a recent *Diving Magazine* gave the incident of an engineer in Kingston Swimming Baths. A recent Service one involved the growing irregularity in which two C.D.'s used the techniques of flushing out their bags to do their stops on oxygen — unfortunately there is no foolproof way of knowing how much oxygen the bags contain and in these cases there just wasn't enough. (It must always be remembered that on many occasions, lack of oxygen produces initially a feeling of supreme confidence which is terminated by loss of all feeling). Fortunately

artificial respiration was used successfully and these cases can be mentioned as serious accidents instead of fatal ones.

From the medical aspect, loss of consciousness is always a serious accident and the causes are many. Lack of oxygen, hypoxia, or anoxia (depending on your choice of word but the last one is usually inaccurate) occurs under circumstances exemplified in the last paragraph. Too much oxygen may have similar effects in that any tendency to faint — hangover, hunger, over-eating, etc. — is exaggerated in the presence of a high partial pressure of oxygen; and this cause leads to the biggest group of the kind of accidents which used to be lumped together as shallow water black-out. This is one of the commonest types of serious accident, especially in inexperienced shallow water divers. Carbon dioxide may also be present in too great or too little amounts. In the first case, rest, to let the absorbent catch up, may be sufficient. The second case is more likely in spear fishermen who hyperventilate, descend and catch their fish and they get no warning from a wish to inspire before they use up all their oxygen. The exaggerated example is the man who hyperventilates breathing pure oxygen and can then hold his breath for 10 minutes — and there still isn't enough C.O.₂ around to beat the effects of high O₂ and so he loses consciousness. Needless to say heavy exhaust contamination of a breathing mixture will in time produce carbon monoxide poisoning.

Minor Accidents

In these jottings, minor does not mean that you can ignore the accident but just that there is no risk to life however painful, tedious, or irksome the consequences may be. In this group, come the ear troubles, sinus troubles, eye squeezes, suit

squeezes, itches, rashes, etc., which may need treatment. However, the variety is too great to detail here. Similarly accidents due to sea snakes, jellyfish, and so on need quite a tome on their own so I propose to ignore them too.

Decompression Sickness

This particular condition however, I will deal with on its own merits. Here the accident may be trivial or deadly, the effects short-lived or permanent and hence it overlaps the three categories of fatal, serious, and minor. I personally have never seen a fatal case of decompression sickness in divers and I hope that the constant work on this problem means that I never shall. Serious cases however do occur often enough to keep people on their toes. In diving, almost invariably these result from inadequate decompression, and the disappearance of such cases lies either in the provision of facilities to carry out proper routines or sensible anticipation to avoid diving where difficulties could arise. In aviation, serious cases occur in high altitude (i.e. low pressure) flights of long duration and they normally recover on return to atmospheric pressure. In both activities some of the more serious cases may go on to a fatal ending if recompression is not used. In these cases the sooner recompression is used, the better, if life is to be saved. They may first appear as fainting or shock but fairly rapidly they progress till the shock becomes 'irreversible', i.e. no matter what treatment is used, the patient will not recover. Those serious cases that do not have a very final course, may still cause a lot of distress in that the patient may be crippled for life — after all that is how the name 'bends' arose — either from the accident or developing at a younger age than the usual process of deterioration with

advancing years. Again the sooner recompression is used, the better the outlook for the patient. The not so serious cases pose a problem in the treatment of the discomfort and pain produced. It is possible that aspirin alone will help and that in two to three days it will have recovered. However, I defy anyone to prove that he can tell, at the time that symptoms develop, what the seriousness of the cases will be or what the effects in 20 years may be. My opinion is firm that such cases should be treated by recompression if there is any supporting evidence for decompression sickness as soon as is convenient — i.e. in apparently minor cases I do not object to a hot bath and a meal before treatment as the 'evidence' could vanish in that time and certainly the

patient may well be more comfortable during the hours at pressure.

First Aid

Finally, in this collection of jottings comes the question of first aid. Far and away the *least* common need will be for immediate recompression. Except for lung damage causing such troubles as air embolism, therapeutic recompression can wait for a few minutes. The most common *first* aid will be simply removal of the breathing equipment and rest. The most vital need will occur where breathing has stopped and revival is essential. Due to wide discussion and debate over the past few years, it is probably advisable to expound on a method of resuscitation which is now accepted as standard in many counties of the

world and, in Britain, is now adopted by the British Red Cross Society, St. John Ambulance Brigade and the St. Andrew's Ambulance Association as well as the Armed Services. By this, I mean expired air resuscitation, rescue breathing, breath-of-life, mouth-to-mouth, mouth-to-nose, etc., i.e. all names for the use of the breath expired by the rescuer for inflating the chest of the victim. No one pretends that the method will be pleasant for the rescuer, but he can be completely confident that it is the most effective means that he can use to restore the victim. It has been reported by people who have rescued victims successfully, that while they were actually engaged in the rescue they had no time to consider the difficulties and, neither would they hesitate on any future occasion in spite of such knowledge.

As a preliminary guide, the following steps are suggested:—

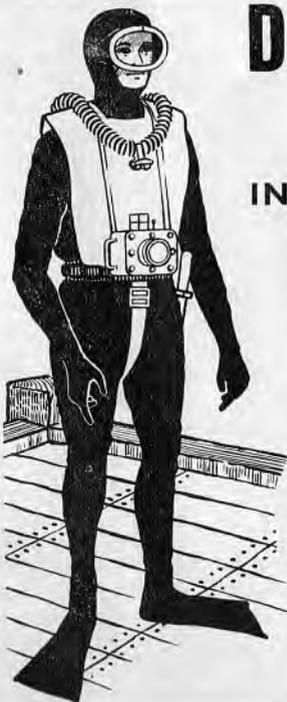
1. TILT THE HEAD OF THE PATIENT RIGHT BACK. This will normally allow the mouth to open.
2. Clasp the nose between thumb and forefinger of one hand and support the jaw with the other. (In a child, leave the nose alone).
3. TAKE A FAIRLY DEEP BREATH AND BLOW INTO THE PATIENT'S MOUTH making sure your lips seal round the mouth to prevent a leak. (In a child your mouth will probably cover its mouth and nose. Use smaller breaths).
4. If the air goes into the patient's chest, you will see it rise. If not, it is going into the abdomen, or nowhere; in these cases, tilt the head further back and push the jaw forward and try again.
5. TAKE YOUR MOUTH AWAY AND LET THE PATIENT'S CHEST SETTLE BACK.

6. REPEAT 10 TO 12 TIMES PER MINUTE. Keep an eye on the stomach to make sure that air is going only into the patient's lungs.
7. When breathing starts, change your own timing to give some assistance to the weak respiration.

Now for some 'Don'ts':—

1. *Don't* waste time. A quick check to make sure there is no 'gubbin's in the mouth of the victim to act as a stopper, is all that is needed. Do not try to drain the patient in drowning. Do not loosen tight clothing at this stage. Do not wait to call for help. Get on with it.
2. *Don't* take too many very deep breaths, too fast — *you* might lose consciousness!
3. *Don't* forget to keep an eye on the chest to make sure your air is getting to the right place.
4. *Don't* forget young children and old people have smaller lungs, so be reasonable with the amount of 'blow'.

In drowning cases, the patient will have regained a pinkish colour within a few breaths and natural breathing will start shortly afterwards. This method can be used in the water, so there is no need to wait to reach the shore if the rescuer can tread water. In electrocution, while the colour may return quickly, natural breathing may take much longer, so don't despair. In poisonous atmospheres, the patient must be removed first but then make sure you keep your mouth away from his 'breathing out' whenever you are not blowing air out. **Envoi.** These are the main points. Remember however that if anything can go wrong, sooner or later it will. By careful attention to detail, just make sure it does not happen to you or that it isn't your fault.



DEEP-DOWN COMFORT...

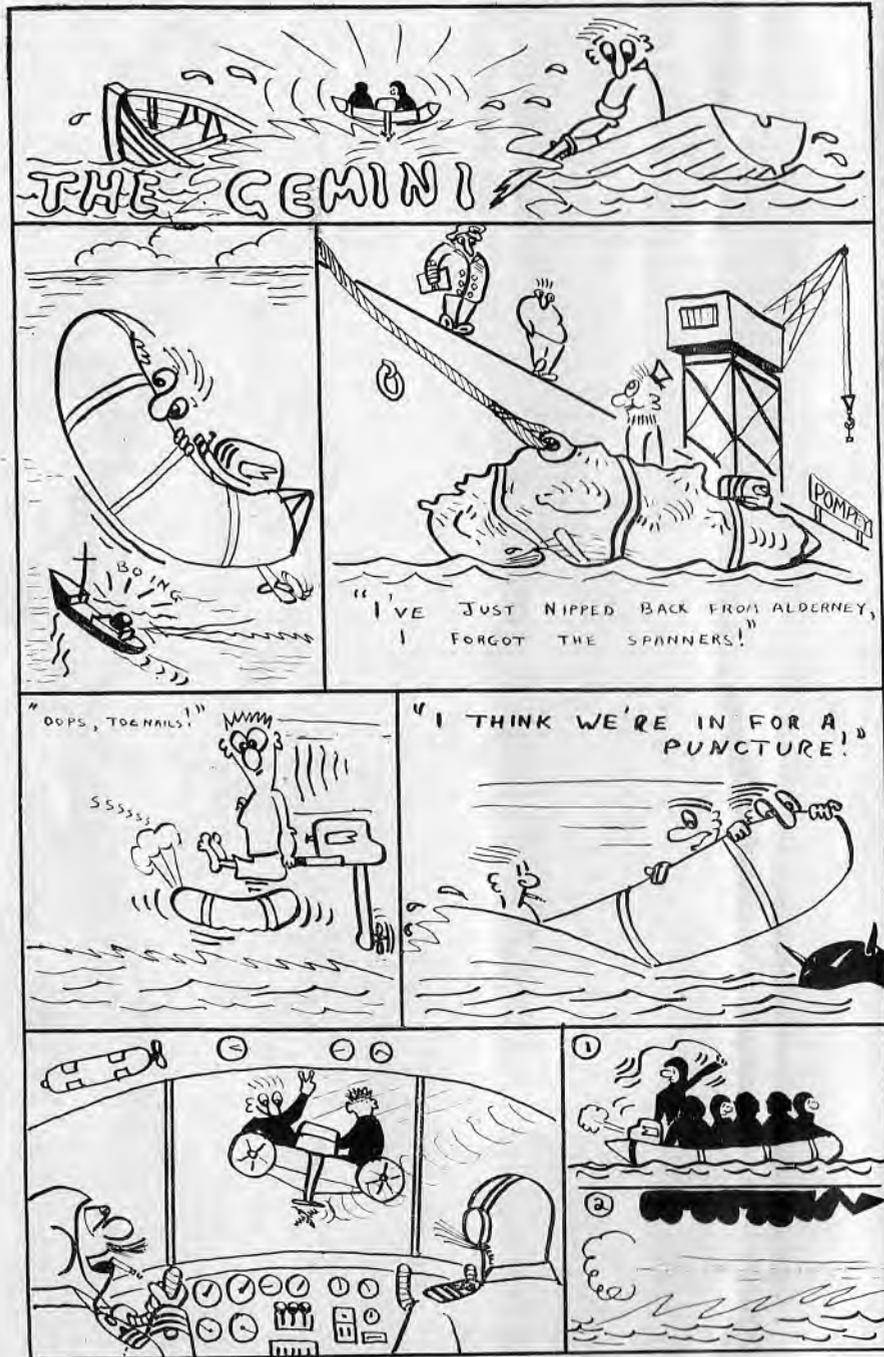
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Advice to the Royal Navy on starting a Sub-Aqua Club

(Name and address withheld in the interests of self-preservation)

FOR some time now I have thought that there has been a very definite need for a book in no less than six volumes on how to help all those who wish to start a branch of the B.S.A.C. and having started it, how to finish it.

Those who have read the well known poem 'Home thoughts from Lavente', will possibly be interested in this paper called 'Home Truths from your Aunty'.

Many people feel the urge to do something really worth while in their lives, and some take to moderately useful things such as Missionary work, Teaching, Medicine and such like, but every so often there is a man, or dare I say a woman, who sees the light, and knows there is something greater than these. Yes, they want to start a 'British Sub-Aqua Club Branch'.

In a recent poll held all over the country 25% said 'No', 13½% said 'Why?' and 52½% had no idea, this the last group, I feel needs guidance.

The first essential of course is to get 'people', how you get them is your own affair entirely, you may like to apply to one of the more reputable agencies dealing in spare people. or you may prefer a gimick to attract them, like running up and down the High Street in full diving gear. I would suggest standard gear is best left to the Naval Recruiting Department, permission from your local Police Station is necessary however.

Having gathered sufficient numbers of healthy bodied (and minded) young people together, and let's face it, there are not many about, you should call a meeting.

A vote should then be taken on (a) should a branch be formed? or (b) should we all disperse and go home quietly?

If the vote goes in favour of forming a branch, then the following procedure must be carried out.

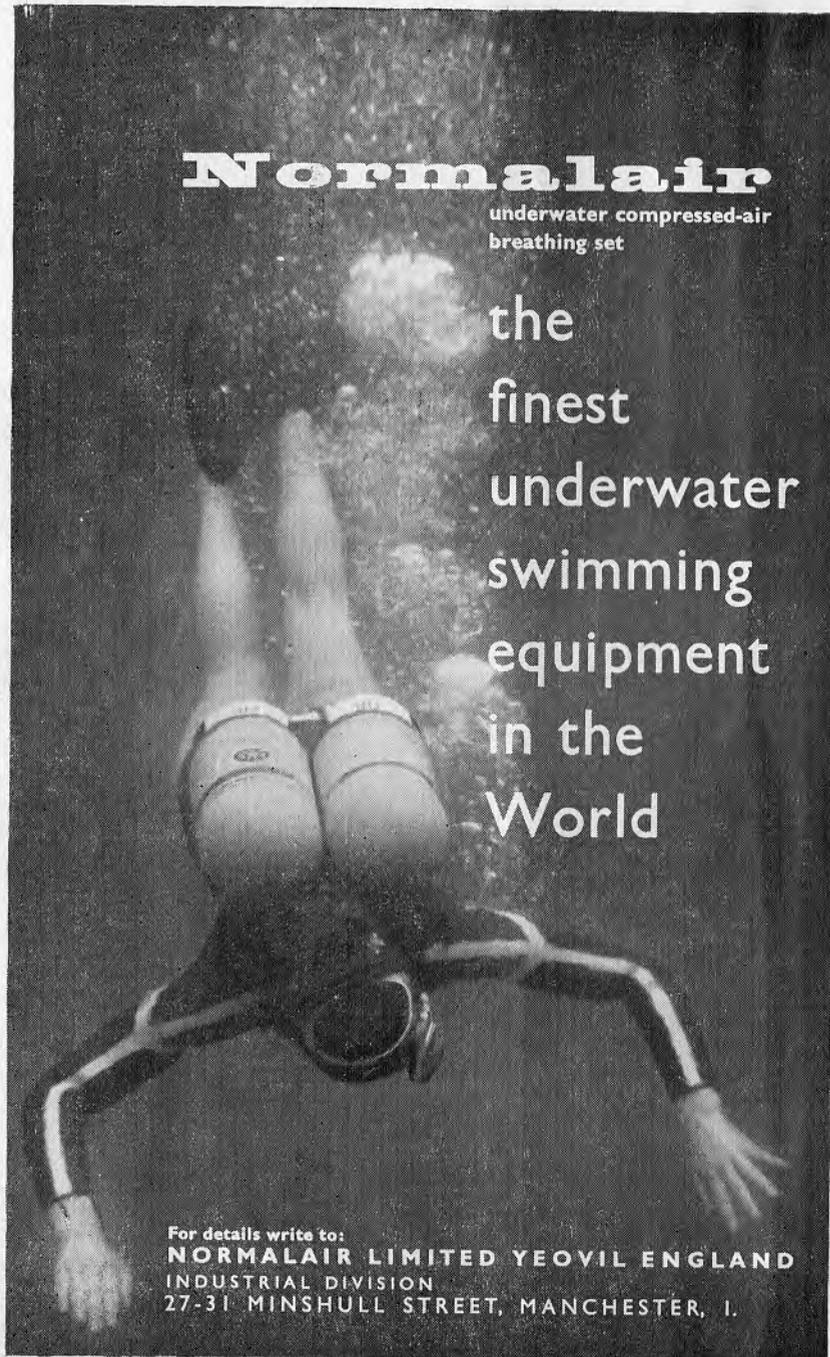
An extremely polite letter must be sent to Head Quarters swearing loyalty and allegiance. A letter to the Archbishop of Canterburg never goes amiss, and a donation in the form of a future Insurance should be sent to one of the following:—

- (a) British Red Cross Society
- (b) Trinity House
- (c) People's Dispensary for Sick Animals.

Having received an acknowledgement from these, your next step is to form a committee. The original voting is vital to your club's future, as in subsequent A.G.M's no one will bother to vote and it is left for the standing committee to vote themselves in for future terms of office, Ad Infinitum.

Always have a large number on the committee with as many members as you can seat comfortably. It's more fun picking them, always pick people who make long and eloquent speeches on any subject put in front of them, those who speak briefly and to the point can ruin a meeting, and you cannot keep an all night sitting going that way. All members should have widely differing points of view on everything from life-jackets to blood sports.

It is good idea to have a lady as secretary, because they are usually good at making tea and sandwiches, and if they should have a bright



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suggestion you can laugh it off all together, more easily than if it were a man.

Make sure each committee member owns a car, this saves the rest of the members buying one, as they will transport all your equipment, and you and all your friends quite cheerfully over the countryside to enable diving to take place at pretty little spots on the coast.

Having now got a committee the next thing is to start a training programme. One of the hardest things is to try to persuade these keen recruits that a diving club is not necessarily formed for diving, there are numerous activities in which they should take part and they should be encouraged to learn the first rule — 'for every hour spent training in the baths — two in the bar'.

A little psychology can help in restraining too much keenness however, and the following suggestion will help.

When a queue of trainees are waiting to assemble their equipment which has been carefully placed at their disposal, it is a good idea to lose the spanner necessary for tightening the nut holding the valve on the bottle, a good half hour can be wasted while they try to find it. None of the instructors should carry a list of tests with them so that they can spend most of the time enquiring from other instructors what No. 5 in Section 'B' should do.

If they receive no satisfactory answer they should cancel everything until next time.

If anyone has started swimming the two lengths in full diving gear, it is quite amusing for three or four older members who have passed this stage of training to jump in on top of them like depth charges, the new members faces can be very funny when and if they should surface.

People who are proficient with mask and snorkel tube can be usefully employed diving and surfacing suddenly and without warning, under a beginner doing his 'Floating on his back for five minutes test'.

Undermining morale is important at this stage. Never have Instructors in the water, they should remain fully clothed at the side of the bath, if possible with a bad cold. Never teach or explain divers' illnesses and never refer to the stoppages table. This will ensure that the Duty Diving Staff at H.M.S. *Vernon* never get any sleep (why is it 'bends' always come on about midnight?)

The secretary should never enter the water, but always be seen solving the many problems that come her way, in stiletto heels, with sheaves of notes in her hand.

Have the diving officer being taught the breast stroke with a life-jacket on. This should quickly dispel over confidence in leaders.

Instructors of course, should always encourage pupils to perform their rolling in backwards with a lung from the high diving board. If all these methods fail, then you will have to accept the fact that you have people who actually want to dive. So plans must be made for making facilities available. The obvious answer is to buy a boat.

With the promise of gloriously sunny days at sea, you may well get members silly enough to buy a large hull with an engine and encourage them to convert it into a combined cruiser.

For the next three or four years you will then make quite sure that though a little diving will take place your branch will be fully occupied with useful forms of employment. In case work should proceed quicker than you had envisaged, make sure

that no one knows what they are doing.

Never saw up any wood unless you have made quite certain someone else has spent hours in painting it. Never clean and paint the bilges unless Tea is ready or the lights have failed. And if the canvas on the deck needs re-painting wait until the day before you decide ballast needs replenishing, always place as much wood, tools and clothing as you can find in the galley and in the sink; this ensures that getting meals will always be made as difficult as possible and your secretary will laugh merrily about it.

Always scrub something which will quickly be made dirty again and never paint the outside of the boat until high water. You should now have managed to get it over to the most stupid, that diving is hard work. But some never learn — so there will come the day when your boat will go on a diving expedition to a well known diving site such as a wreck or group of rocks. If you can't find them, then swear blind that they have been moved.

All experienced divers should be encouraged to show two new members a completely nonchalant attitude to the perils of the deep, they should laugh and joke light-heartedly when the sea is obviously too rough for diving and should scorn the elementary safety rules of wearing life-jackets and using safety lines when

ever possible, having previously of course arranged a fully equipped stand-by team ready at a well known signal to rescue them. (SLIDE).

It is a good method of training to ensure that the pupil should make his first dive loaded with essential equipment like knives, depth gauges, compass and very pistol. The instructors should always shout last minute advice when the pupil is clinging to the ladder with his feet safely wrapped in a cocoon of slack safety line.

If a new diving member, not used to the movement of the boat, is looking rather green and muttering something about returning to mother, it is an appropriate time to undo a flask of steaming hot vegetable soup.

If after all these ideas your branch is still keen to go on diving, then one can resort to drastic methods which should by right put an end to it.

Why not arrange a conference and hire the sports stadium to hold it in.

It is of course a very nice friendly gesture to send flowers to the organising committee when they have been admitted to a Neurosis centre, and they will love you for it, they really will. Obviously much more advice could be given, but I think this framework you should be able to add your own ideas and achieve great heights, if not depths.

Good luck to you all and remember — 'they also serve who only stand and watch'.

Underwater at Lipari

by J. D. HAWKINS

A slightly inaccurate title, as LIPARI is two hours travel by ancient Sicilian fishing boat from the Isle of Panarea, but Panarea doesn't look so attractive as a headline, it would appear to fit better into

a Medical rather than a Diving Magazine.

It must have been quite a night, 75 years ago, when a British Cargo boat, about 6,000 tons, registered at Cardiff 10 years earlier, carrying

grain, hit a large lump of volcanic rock sticking out of the sea, about half a mile off Panarea.

Starting 6 feet from the bows on the starboard side, the plates are first gouged out, then creased inwards and finally disappear in a hole about 15 feet long by 4 feet deep.

Sinking by the stern she slipped backwards and downwards coming to rest 300 feet away from the rock, with her stern in 150 feet of water and her bows in 90 feet.

The water visibility there was about 100 feet. Finning along the sea bed, 90 feet down, there suddenly loomed out of the blue grey light the massive bows of the ship, towering up and appearing to be still cutting through the water. A tangle of rails and other bits of super-structure lay in the sand at the foot of the bows, thrown over by the force of impact. Swimming in through the hole there was a twilight world, grey light filtering in through the hatches.

A gleaming evil looking eye appeared. Stopping short and slightly taken aback, a second look revealed the outline of a head and then beared white teeth of a Moray Eel, looking just like the mother-in-law. We finned quickly in the other direction. All the timbers having rotted long ago a skeleton of a ship remained. Holds, saloon, engine room, Captain's cabin, a quick squat on his private toilet — wot no seat — then through the after hold, up through the hatch, over the stern rails and down to the rudder and screw, one blade missing, presumably sheared off when she settled. Finning back slowly along the whole length of this dead ship she seemed to be very sad and lonely as we returned to the hot sun, colour, bustle and life of the diving boat.

Moving off, we then dropped anchor off the small village on the Island of Panarea, small white-washed cubes of houses dotted up the steep side of the small old volcanic island.

Going ashore we landed on a beach of grey volcanic ash and then padded bare foot up and along narrow alleyways with dazzling white walls, dusty cactus, blue shadows and purple bougianvillia.

A magic sign — BAR — cool smooth tiles under bare feet and cold smooth beer under bare tum — heaven.

Back on the beach, a large black iron cauldron — Mk.1., witches for the use of — bubbling over a fire of driftwood and diesel oil. Bouillabaisse — sounds better than fish stew and tastes better than it looks — containing assorted bits of Grouper, Octopus, Langouste, Rascasse, together with onions, tomatoes, green peppers and garlic.

A carboy of rough red local wine, helped to wash down the bits of fish and lava dust.

The next day, another island in the same group and another wreck, somewhat older as she was reputed to have gone down about 400B.C.

200 yards off shore a pillar of rock rises 100 feet sheer up from the sea bed to 8 feet below the surface. It appears like a cathedral of natural rock, fluted pillars, arches, grottoes covered with marine life showing thousands of yellow buds interspersed with splashes of red and purple.

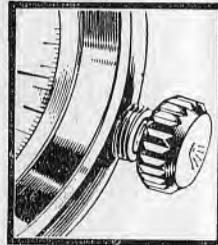
At the foot of this colourful and massive marine altar, lying like a sacrifice, were hundreds of Greek Amphorae, once filled with oil or wine but now with sand, many of them still unbroken, piled on each



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other half buried in sand. Scattered among the amphorae was finely glazed black pottery unaffected by 2,400 years of immersion, glistening

black and looking as though it had been but recently broken. Of the vessel which carried this cargo, nothing remained.

Editor's Note:

The following is an extract from the second edition of *Whispers from the Fleet* by Rear-Admiral Sir Christopher Cradock, K.C.V.O., C.B., published in 1908. It is reprinted here by kind permission of the publishers as a sobering reflection from the past.

Diving

I have never been down in a diver's dress myself, but to gather from some of the extraordinary and forcible remarks that I sometimes heard issuing from the diver's helmet immediately the glass has been removed, I should surmise that at times a diver's life is not altogether a happy one.

The shot rope should be of three or four inch hemp, and 30 to 40 fathoms long. Pig ballast makes a good mooring sinker, and the sinker should be fitted with a light 'wandering line' to assist and guide the diver in thick water or a muddy bottom.

The care of the diver when he is down should be extreme, and the chances of forgetfulness so guarded against as to be impossible—although here is one such case of empty-headedness as I know occurred. The diving boat was by the gangway of a ship with the diver down. A Captain in his Galley, some distance off, appeared to the Officer-of-the-Watch to be heading for his ship. In his zeal, he (the Officer-of-the-Watch) screamed to the men in the diving boat to 'stop pumping' and haul ahead — picture the diver's face could he have heard.

When working alongside in rough weather, the diving boat should have two or three stout spars, with inboard ends projecting, placed across the boat and securely lashed, to keep her clear of all projections on the ship's side, and to protect the boat from injury — the ends of the bars should be rounded.

Fixed and recognised signals for communication with the diver are given in the book of instruction: i.e. — 'more air' — 'Less air' — 'Diver is alright' — 'Coming up, etc. All other signals are arranged for between the diver and his attendant.

All signals from below are reported to the Officer-in-Charge.

Precaution for boat and gear. See that the air pump is in good order, that the pipes are sound, and that there is a plentiful supply of leather washers. That breast ropes and signal lines are good, and the telephones should be tested before going away.

If telephone signals are used, signals are considerably reduced.

A clear space for the pump should be selected in the boat — if a small boat, before the after thwart, if a large one in the stern sheets.

Men likely to belong to the crew of the diving boat during a commission, should be at intervals put through a course of diving signals with the divers that they may be called upon to attend; this may be done by placing the diver on the main deck, and the attendant on the upper or boat deck.

In hot weather, drinking water should be taken away in the diving boat for those who want it.

In a head sea, always put the diver's ladder down over the stern of the boat, for it is easier to place the weights on in this position.

A diver should gargle his mouth out with water before he descends, and place a drop of oil with cotton wool into his ears, as it tends to lessen the noise made by the out rushing air from the helmet.

When a diver is at the bottom, he must be careful not to let his head and helmet get below the level of his hips, for if he does, he will assuredly 'blow up', i.e. capsize, and come up to the surface stern first with considerable shock to himself — he also runs the risk of haemorrhage from the nose and ears.

The sitting posture is a safety position from blowing up, and to get there, go on the knees first, and then use one hand to settle down with. Reverse the process when wishing to stand up to come to the surface.

The diver's limit is about 25 fathoms, and at that depth his limbs are very nearly in a vice; it is also twilight away down there, except on the very brightest sunny days.

It is said that on account of gas bubbles forming in the blood, no diver should make a descent for some considerable time after operating in deep water. For instance, if he has been working for one hour at a depth say of 15 fathoms, he should not descend again for three hours, or again, if he has been down for a

quarter of an hour at a depth of 25 fathoms, it is dangerous to take another dip that day.

The divers of every smart ship should be examined each morning by the doctor as a matter of routine — it is no hardship, and soon becomes a custom.

At night, the diver is supplied with a 50 candlepower incandescent light, the lead being well insulated with indiarubber attachment where it passes into the lamp.

To keep the helmet glasses free from all condensation, rub the inside of the glasses lightly with a little clear glycerine.

A diving pump has to be tested daily, and the handiest method of doing so is to have the testing flask secured to a bulkhead, or somewhere close to the usual home of the pump — then a few feet of piping and a heave round, will do the trick at once.

If a diver gets lost or foul below, he should signal for the assistance of another diver, who would follow his wandering line, and bring him back.

When divers are at work endeavouring to stop a hole in a ship, a projectile slung as a monkey and lowered below, has been found useful for driving home the plugs that fix the shot mats, oakum, canvas, fearnought, and all the hundred and one obstructions that may be suggested to fill the rent.

And now I will cease my 'bubbles' on diving, for the thoughts on the last situation make me shiver; and the whole subject has suddenly become too disagreeable for words.

Londonderry Diving Team

THE team now consists of:—
Lt. D. O'Brien (S.D.) TAS
I.D.O.
C.P.O. Edward, Diver 1

L./Sea. McGrath, Diver 2
L./Sea. Williams, Diver 3
A.B. Culpin, Diver 2.
The first offering from Derry for a

very long time — reason must be overwork or something. Anyway now that we have surfaced and appeared in print I see no reason why we cannot make the post more regular—a promise.

Routine work continues, mud from the slipway, foul screws, submarine examinations, exercising S.W.D's and a monthly jolly in the Derry Swimming Baths. To break the monotony a few jobs out of the usual turned up — most welcome.

A lost outboard motor in Lough Swilly provided us with a run over the Border. It was found and the team were duly wined and dined by the grateful owner who also sent a cheque for Naval charities. An unsuccessful attempt was made to find yet another motor in the Foyle but nevertheless the team were handed three 6½lb. salmon for their

efforts. The Diving Shed looked like a fishmonger's shop during the cutting up process for the share-out.

For the Sea Eagle Summer Fair, our tank was towed through the fair city of Derry and installed in Clooney Park — that caused a fair old panic with the traffic in the narrow streets — the language was terrible even though it sounded Irish at times. We gave a Static display in the tank, i.e. Standard using Seafire and a swimmer making faces at the crowd through the various portholes. To complete the picture we had a blown up Standard and a tailors dummy dressed in Mk.1 with U.B.A. plus a few tables with interesting items laid out, Cox's Gun, etc. A tiring, but happy day—the team being jealous of the Boss's appearance on Northern Ireland T.V. news!

The Sea Eagle Sports Day provided



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us with our yearly appearance in the Standard Boot Race over 50 yards. The team, naturally, came first and to collect the bottled beer prize, Chief was pushed up to the prize-giving table in a wheel chair — he was sadly in need of both chair and beer after the run!

Our really big effort was the Port Diving Units appearance in the Lord Mayor's Show at Belfast. Having been told to do something we got cracking and, with the Base Engineer Officer's assistance, transformed a Pussers three ton open lorry into a replica of our diving boat complete with bow wave and diving flags hoisted close up. A Standard diver on the ladder, and walking behind, when speed of boat allowed them, two swimmers posing in Mk.1's with U.B.A. complete, diving pump heaving round, and voice communication going out completed the picture. The official report on the Show read 'the loudest cheer from the packed streets was for the diver walking behind the Diving Boat. We did not win a prize, but our three days in Sydenham preparing for the Show were most enjoyable.

A smart turn out by the Team for Commander-in-Cheif, Plymouth inspection. The departmental was carried out by Lt.-Cdr. Roberts, v.c. who dived in the tank and tried the *Seafire* and then inspected the slip-way from the diving boat. We regret to report that he had a wet dip, but

fortunately for us this did not affect our inspection report.

The Team joins me in wishing S./Lt. Hillman every success with the C.D.O's course and the best of luck to all Divers everywhere, especially A.B. Wilson, Diver 2 who has just left us for the bright lights and easy living of civy street with his 'Just Married' banner hoisted close up. Good luck Tug. D.O.B.



C.P.O. Edwards, Diver 1
A.B. Wilson, Diver 2

Underwater Physiology

by SURG/CAPT. S. MILES, R.N.

THE world's newspapers have announced the conquest of space by man. A manned satellite has circled the earth and its occupants have returned to tell their story.

It is a great scientific achievement and much credit for the success goes to the 'space' physiologists who for many years have been studying man's reactions to such extra-

terrestrial hazards as weightlessness, acceleration and deceleration, confinement, radiation and above all the intense psychological phenomenon of being remote from mother earth.

Oddly enough the conquest of space, has, in spite of the emptiness and timelessness of the aspect, fired the imagination of the general public whilst the conquest of the rich unfathomed depths of the oceans has stimulated little enthusiasm.

Economically, and as a challenge to man's adventurous nature, freedom of movement on the sea bed without gross time restriction is every bit as important as putting him into orbit.

This is a challenge which must be faced. Already underwater swimmers and underwater physiologists are giving much time and thought to how this may be achieved. It is not sufficient to send a man down in a submarine

or bathyscope for such a means denies him freedom of contact with and movement in his environment. Nor will conventional diving techniques meet this requirement, for time so spent below the water is greatly limited by the endurance of breathing apparatus and the need for lengthy decompression procedures.

Imaginative scientists and underwater explorers such as Sir Alistair Hardy and Commandant Jacques Cousteau have given vivid pictures of the underwater potential and have spoken of undersea farms and villages where divers would live and work for weeks on end. Our colleagues in the Underwater Research Laboratories in the U.S.A. are known to be patiently and successfully completing essential basic research. Sooner or later success will come with undoubted benefits to mankind.

The obstacles to be overcome before man will conquer the underwater environment give a good idea of the research still to be carried out by the Underwater Physiologist. The ultimate object is to construct some sea bed dwelling ventilated with a suitable atmosphere maintained at the pressure of the surrounding water. In this divers may live for many weeks and by means of underwater breathing apparatus leave the dwelling from time to time to explore or farm the sea bed, perhaps aided by small submarine propulsion units. As the endurance of the breathing set nears its limit the diver can return to the shelter to recharge the set or to go off duty without need for any decompression routine as would occur on surfacing. Decompression would only be needed on completion of the tour of duty.

In this new situation man remains continually at the pressure of his working depth with perhaps most of the time in an environment of air or its equivalent and remainder in water. In approaching this problem the physiologist must use knowledge and experience which have already enabled a suited diver to work on the bottom for a short while at a depth of 600 feet which have made diving safe and increasingly versatile, and have evolved an efficient method of submarine escape from useful depths. Naval, commercial and recreational diving is rapidly expanding and man's final conquest of the deep draws nearer.

Even in air under high pressure, man faces many new hazards largely by virtue of the fact that, although the tissues of the body behave like a fluid and being thus incompressible adjust themselves at once to the new pressure, there remain spaces such as the lungs, gut, internal ears and sinuses which contain air or gasses. Where there are gases changes in

pressure result in changes in volume, density and solubility in the blood. This may profoundly affect the working of the body.

With increasing depth, increase in air pressure causes adjustments in pressure behind the ear drums to be necessary, usually achieved quite simply by swallowing or increasing intra-nasal pressure. This is a trick which becomes almost second nature with experience but inability to perform it is a common eliminating factor of would be divers. It becomes absolutely necessary to maintain the air which the diver is breathing at the same pressure as the water at his working depth. Failure to do this may have disastrous results.

As air pressure in the lungs increases with depth so the ingredients of the air, oxygen and nitrogen, dissolve in increasing amounts in the blood, and pass through the lungs to diffuse freely therefrom into the various tissues in the body.

Excess nitrogen absorbed in this way can eventually produce a narcotic effect with ultimately loss of consciousness. This can be seen, particularly in the inexperienced diver, at depths beyond 250 feet as behaviour akin to drunkenness.

Excess oxygen also is a poison which may produce convulsions rather like epileptic fits when air is breathed at depths greater than 300 feet (Pure oxygen may produce this effect at 30 feet.)

Apart from its narcotic effect, nitrogen dissolved in the tissues will, if pressure is suddenly released (as in bringing a diver quickly to the surface after a long deep dive) produce bubbles which may enlarge or join up causing pressure on nerves or blockages in the circulation. This results in the painful and sometimes serious condition of decompression sickness. It is for this reason that,

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following dives of certain depths and duration, the diver must be surfaced, by slow stages. This makes repeated deep diving time wasting and emphasises the need for a technique to keep man in an undersea dwelling so that a whole series of dives can be accomplished for one final decompression schedule.

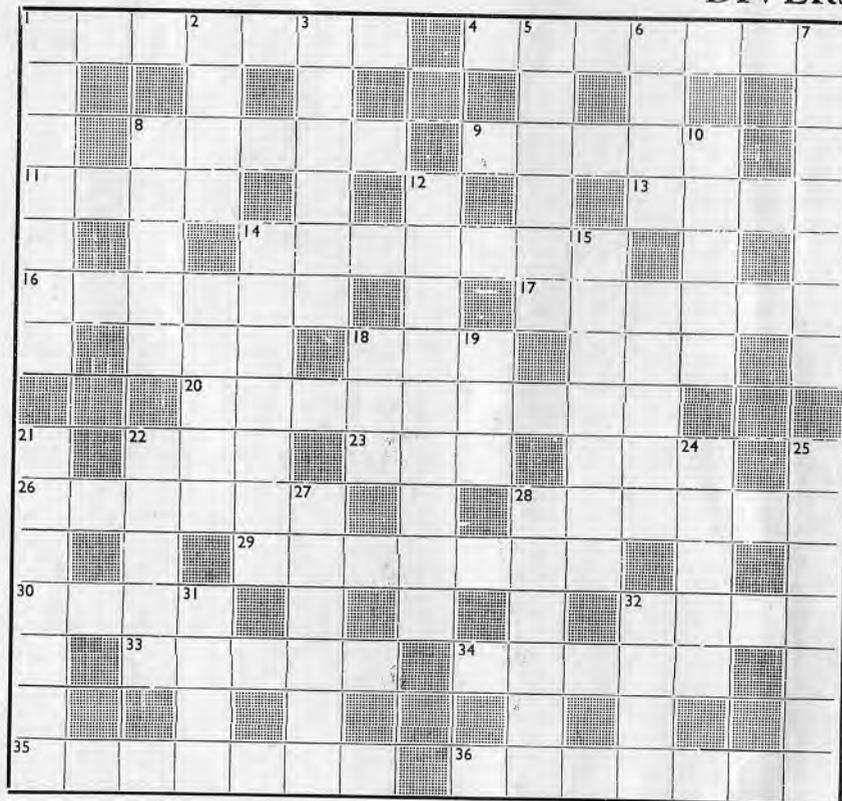
Furthermore, as air pressure increases so does its density. Denser air is more difficult to breath giving extra work for the respiratory muscles, and so limiting maximum effort. Possibly also the washing out of waste gases such as carbon dioxide from the lungs may be

impaired. Voice changes may make communication difficult.

All these problems occur in air alone. Surround the man with water and he is faced in addition with distorted vision, loss of directional hearing, impaired locomotion and a sense of profound isolation.

The underwater physiologists have a big task in putting man safely in his sub-aquatic home but the answers are known to most of the problems and theoretically at any rate the object can be achieved. Subsequent articles may show how this is being done.

DIVERS'



The Mobell

by JOE BROOKS

Part 1—INCEPTION

THE object of this paper, which is written in three parts, is to describe the evolution of the Mobell concept and its application, so that it can be seen how experience and experimentation have gone together in forming the principles of a machine which should be useful in the future for all forms of underwater work in which the diver is required to operate.

Part 1, is devoted to showing how

some experiences, gained in the second world war, started a thought pattern which was the beginning of the Mobell project. Since the war, I have endeavoured on many occasions to complete the work of applying this concept to peaceful purposes, but this has not been easy, not only because of the complexity of the problem, but because it represents a break from conventional techniques.

The idea of using a mobile diving

CROSSWORD

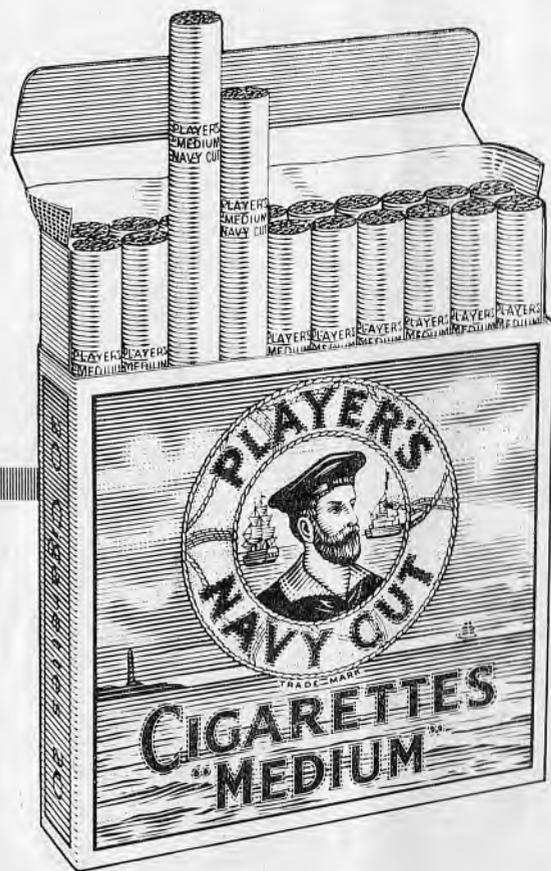
ACROSS

1. Don't eat your suit — it's this all ready (7)
4. This snake led off for a good view (7)
8. Make all well — good for a run ashore (5)
9. Dozens of them — getting really fat (5)
11. Change for the fare (4)
13. Wedge edge (4)
14. She's a good starter in life (7)
16. You can never get enough (6)
17. Puts up the cost of production (6)
18. Zero, before you read a bearing (3)
20. Wet on the floor — you'll see it in a police programme (4, 5)
23. Just in time (3)
26. Wind away with the staggers (6)
28. Ton-up boys! — this is no three-legged event (1, 1, 4)
29. Full of beans on circuit training?
30. Initially of good family, and topped up with the right atmosphere (1, 1, 1, 1, 1)
32. Colourless name, deprived of its tail (4)
33. Poor Williams — in a hole again (5)
34. Wonder what they'll think of next? (5)
35. Shake well or breathe deep — but take account of the depth (7)
36. Good name for a wrestler? (7)

DOWN

1. Better than the best (7)
2. Where the surface is? (4)
3. One way to get the truth! (6)
5. The end of a poetic wife? (5)
6. Oriental Teas (4)
7. Bright — 'is he, son?' (5, 2)
8. Ancient, if beheaded and altogether furious (5)
10. Essential to a pools' syndicate (5)
12. Too much gin to Wren and you might be! (5, 4)
14. Three gone, three to go (7)
15. Nelson used it to keep every man from England (7)
18. That's all right, then (3)
19. There's often one 'outside' on a 'boat' (1, 1, 1)
21. A mythical earth mover (7)
22. Almost their namesake, he shared their element (5)
24. Give or take an apple, April's the time (5)
25. Don't dive before you do! (3, 4)
27. Can you change this gurgle before the wind (6)
28. Makes eye-black unnecessary (6)
31. From Brazil (?) (4)
32. Dish of occidental origin (4)

Solution on page 48



PLAYER'S please

THE WORLD'S BEST LIKED CIGARETTES

bell (Mobell for short) for assisting divers in their work, arose in 1942, when we were working against time to develop an effective means of penetrating the steel nets which protected enemy battleships from submarine attack.

The difficulties that had to be overcome in traversing hundreds of miles of turbulent ocean in a small submarine, were sufficient in themselves without having to cope with the need to operate divers outside the submarine for cutting nets, placing charges and also for watch-keeping on the surface in bad weather

The result of all this was that one very quickly learnt how to deal with the problems and pitfalls of diving in self-contained breathing equipment. One also learnt how to improvise equipment to compete with unexpected difficulties. This was an ideal breeding ground for new ideas, unhampered by the dictates of convention.

The glorious vein in which the exploits of these little submarines have been portrayed in both historical and fiction accounts, bears a distorted picture of the truth. The job itself involved many months of tedious work in unsafe conditions, whilst struggling to get some sense out of the machine which was cluttered up with hammy engineering and the sort of electricity that used to set things alight with ease.

The particular incident that first caused me to appreciate the possible advantages of the mobile bell, occurred one day when we were working up for the attack on the German battleship *Tirpitz*. Another diver and myself were engaged in cutting a submarine through a practice net, when she was swept broadside into the net by the strong current that was flowing through it. Because of this, we now had to cut the net along the

entire length of the submarine in order to let her through. The strain of holding on against the pull of the current, at the same time as operating a rather cumbersome hydraulic cutter was beginning to overwhelm us before we could complete the task. To add to our difficulties, we were below our safe oxygen depth, because the submarine had lost trim during the manoeuvre. The other diver had already blacked out alongside me when I remember thinking how much safer and easier it would have been to have done this job from a mobile air lock which could be positioned to enable the diver to devote all his energies to the use of his tools and also to provide him with a readily accessible underwater life raft.

On this occasion we were lucky and our inert forms were picked up downstream of the net, but others were not so fortunate as us. A view through the wide vision periscope of a diver, writhing in a semi-conscious paroxysm, is not easy to forget. The strains which were imposed on the minds and bodies of those who were required to go outside, had to be experienced to be really appreciated. Safe air breathing was not allowed, due to the presence of tell-tale bubbles which might have given our position away to the enemy and mixture breathing had not yet been introduced, so we did our own oxygen tolerance tests whilst working on a task, by the 'suck it and see' method. Now an important point about the Mobell concept as affecting the future, is that we are now approaching a stage when more effort is being devoted to breaching, what might be called the Pressure Barrier. That is, the stage which is reached when the partial pressure of certain gasses will start to impair the efficiency of the functioning of human brain. This barrier is reached

with neat oxygen at as shallow a depth as 30 feet, but when mixed with other gasses in a low partial pressure, such as hydrogen or helium much greater depths can be plumbed before the barrier is again reached. In order to be able to work effectively in the fuzzy state of mind which is caused by this barrier, the diver needs every physical convenience in the way of assistance whilst working and a base to work from.

Again, it was experiences gained during the last war which brought about the practice of working divers from an underwater base, as opposed to working them from the surface. It is not easy to appreciate the advantages of this. After many days at sea in filthy weather; using the same bucket for every purpose, whilst carrying out various tasks from navigating through minefields to clearing a surge of electrical faults, the final process of putting on a diving suit to go 'outside' used to render in me, an interesting degree of shock, brought on by exhaustion, anticipation and fear, which made all my thoughts and actions become slow. Once outside, however, one recovered to a certain extent because there was so much to do. Finally, on return to the warmth and comparative comfort of the control room, one was able to appreciate the true value of an underwater haven which enabled one to dive in conditions which could not be contemplated by those operating from the surface.

An aspect of this early work in the use of an underwater base was that divers were trained never to approach the surface under any conditions. To retreat to the surface in enemy waters, was quite out of the question. If in difficulties, one had to re-enter the flooded compartment in the submarine and shut the hatch, before air could be introduced to relieve the situation. Now this was not an easy

task for an exhausted diver and here again, the Mobell concept cropped up; a small air lock would have been a great asset, not only for providing a diver's retreat, but also for enabling them to remove their masks, breathe naturally and discuss the problem of their work together, or by telephone with those inside the submarine.

A further development of this particular scheme, would have been to site this 'airlock' alongside the compression chamber, to enable a diver to pass through from the control room to the sea via compression chamber and air-lock, in easy stages. On return from the sea, he would repeat this drill in reverse sequence. This arrangement could also accept a mobile air-lock instead of a fixed one, thus enabling the diver to enter the air-lock or bell and proceed out onto the job in his machine, containing all the tools, gas and power which he requires to be able to get on with it.

But we didn't get around to trying any of these things seriously, because although they might have improved the safety and operability of divers, they wouldn't have improved the military capability of the submarine and may even have impaired it. So, apart from a few drunken sketches in the wardroom of the depot ship and an interesting experiment with the top half of a Varley suit, the whole thing was dropped. Since then, I've tried various types of propulsion unit and air-lock combination all of which have introduced various 'unexpected snags and it is only in recent years that a measure of success has been achieved, which offers some hope for the future.

The answer to the problem does not simply lie in bunging a propulsion unit behind an air-lock, as I discovered with the first experimental unit 12 years ago. There are many conflicting requirements for the

machine, all of which have somehow to be married, if it is going to be of use. For instance, it must have sensitive manoeuvrability in both vertical and horizontal planes right through a speed range of half to six knots, if it is to be used in strong tidal streams or for survey work, although a machine which is only designed to rise and descend at slack water can be more simple, as the dynamic problems are not so great. Then the stability of the machine must be such that the air in the lock will not spill out under the action of side forces either on the sea bed, or in mid-water, or when on the surface. Finally, the distribution of compressed gas, ballast and air-lock must be such that it is useful to the diver, either for working from within the confines of the machine, or for working exterior to the machine. The problem of stowing sufficient power and compressed gas to enable these requirements to be met, is considerable, particularly when the machine is required for deep work. Because of this, the design must include arrangements for the provision of surface supply of compressed gas and electric power, which enables the

storage in the machine to be kept for emergency use.

Another way of looking at this aspect of the Mobell is to compare it to existing deep diving equipment, which consists of an air-lock with surface gas supply only and limited vertical mobility. This is undoubtedly a step in the right direction, but the suit forms a sealed unit with the air-lock, which means that the man is restricted and cannot get out of the air-lock to work. Furthermore, although he can move on the sea bed horizontally, he cannot do so in mid-water and the impeding surface connections can be a severe handicap when the sea is rough or the tidal stream is strong.

Recent tank tests and sea trials have begun to show what the final configuration should be and parts II and III of this paper cover this in detail.

* * *

Editor's Note

It is very much regretted that the numerous and excellent illustrations supplied with this article had to be omitted because of the prohibitive cost of reproduction.

Divers Excel in Divisional Sports

by C.P.O. R. H. G. MCKINLAY

ON Thursday 27th June, H.M.S. *Vernon* Inter-Divisional Sports took place at Pitt Street Sports Ground. With some good 'Volunteers', the Diving Division managed to field a very strong team.

The day started with two very convincing wins for *Deepwater*, C.P.O. McKinlay, after some secret practice, won the Hammer throwing event and A.B. 'Chic' Elliott, after being talked into it, won the 440 Yards Hurdles, establishing a new

Vernon record for this event. Elliott also won the Steeplechase.

As the day wore on, the Divers began to establish a good lead in points over the other Divisions, our only weakness being in the sprint events, although we did manage to have a finalist in the 220 Yards and 100 Yards. This error should soon be rectified. If we were weak in the sprints, we reigned supreme in the middle distance events, gaining maximum points in the 880 Yards 1 Mile,



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Steeplechase and 3 Mile, having two runners in each of these events. They ran very strongly and were only beaten in the Mile and 3 Mile by Steward Meadows, a Navy champion on the track. Luckily for us he was only entered as an individual, so our men in these events still gained maximum points.

A final mention for the Tug-O-War a real trial of strength, where once again was proved the mighty strength of the *Deepwater* Division, well coached by P.O. 'Bob' Atkinson, our strong men won this event without losing a pull, and hardly conceding an inch of ground. They were roared on to success by the lusty voices of many supporting divers chanting 'Down — Up', 'Down — Up' until they had dragged the opposing teams to defeat. This being the final event the points were totalled, and *Deepwater* won the day with a total of 137 points against our nearest rivals, The Ordnance Division, who were second with 85 points, a convincing win, completing the hat-trick in *Vernon* Sporting events, as we had already won the Cross-Country Run and the Swimming Gala. A.B. Burton, I would like to add was a tower of strength, not only did he compete and win with his arm in a plaster cast, he did a lot of hard work organising. The Tug-O-War team incidentally had a total weight of about three-quarters of a ton between them.

We have now added another victory to *Deepwater* honours which I think is for the first time, that is we have acquired the Cricket Knock-Out Shield.

Vernon won the Water Polo League and at one time or another seven Divers were in the team.

Football has just started and *Deepwater* have commenced with a 2—2 draw (but there even 'Spurs' lose).

I think you will agree that it has been a real good show by *Deepwater* in the Sporting World and I would like to thank all those that have taken part for making it such a great success.



Lieutenant (SD) (CD) (G) REA, M.B.E., R.N., Bomb and Mine Disposal Officer, Malta, has been informed that he will return to the Gunnery world for his next appointment. The above picture indicates that he is preparing for the great change over.

The Horsea Monsoon

AS the classes battled their way towards the diving section against the heavy rain squalls, it was painfully obvious to one and all that it was going to be 'one of those days'. Just how much it was little realised. The wind was gusting up to 60 miles an hour and the rain was increasing both in quantity and quality every minute. Any attempt to keep dry was foredoomed to failure; the obvious place to be was in a suit submerged. (Not since the days of S.9's have I witnessed such a scramble to get in the 'oggin).

The forenoon progressed — so did the weather.

Occasionally a dinghy was sighted through the squalls, Instructor and standby diver bailing frantically, with the attendant crouched over the oars, struggling to keep station on the dipchicks below. In one particularly

heavy shower a shallow water candidate must have been under the impression that he was on course to qualify disciple for he had taken two paces forward to the water before he realised that the jetty was no longer beneath his feet. Needless to say, his faith in his capabilities was insufficient to bear him up and, just like Yogi Bear, down he went, Boo Boo. One of Micks hens, a proud bird of mature statue, suddenly became airborne (with landing gear and wings in the 'housed' position) and, just as abruptly, made a crash landing on the work bench. After a brief pause to check take off, it headed for the pen in a very shaky state with engines at half boost.

A clearance diver candidate almost 'came off own request' in despair as the wind continually sprayed the proto from his sieve as he attempted

to refill his canister.

Able Seaman Bent, struggling manfully against the gale with a kettleful of freshly brewed tea, suddenly had his oilskin whipped up over his head, carried out a beautiful admiralty sweep to starboard and made what appeared to be a valiant effort to climb the office wall with the tea kettle in the 'high port' position. His failure to complete the climb was obviously due to a sudden wind change, for, without warning, he changed direction left and shot across the road at flank speed coming up all standing alongside the coal bunker, with the kettle now in the 'long point advancing' position. It was worth a guinea a box to see Bent struggling to regain control of his utensil and his sartorial aplomb at one and the same time. He looked like a Bulgarian fan dancer with the itch, doing the Highland fling.

Chief 'Pancho' Powis, making a sortie to the galley 'bicyclewise' left the section under storm canvas, running free. He goosewinged his way merrily as far as the road junction, where he became the sudden victim of a catastrophe. Chief, not being *au fait* with Horsea Monsoons was not too dismayed when he saw the road ahead of him flooded. What he failed to appreciate was that, like the sea bed, the galley road has its ups and down and Pancho quickly found a down. His machine (a relic of the transport division attached to the building of Hadrian's Wall) was not fitted with echo-sounder and chief unfortunately took a false reading with his hand-lead line of 'depth over roadway' for in no time at all he, and his ancient velocipede, were at cross-bar depth (only briefly be it noted). As all students of goglyography know, water is possessed of many virtues(?) and chief very quickly discovered some of them. That in quantity it has a violent braking

effect, is wet, penetrating, cold and uncomfortable. Some ten minutes after initial sailing time poor Pancho was sighted struggling back towards the section with both himself and cycle in a bedraggled state. After listening to a discourse (given in West Country style basic English) on the weather, his personal state, feelings and life in general, it was safe to assume that Chief Petty Officer Powis Diver I, was not feeling at peace with the world. In fact he categorically stated that he has denounced his old way of life and discarded his motto of 'strength through joy'.

In view of chiefs lurid 'State of the Union' report, Sir Hook quickly organised a full-scale reconnaissance of the Food Emporium and surrounding grounds. All hands climbed into mark ones, were briefed, and moved into position for the advance. Progress was slow, hazards many. Low bushes, brambles, sudden variations in depth, trip wires (relics of the last great struggle) and ponies tethered at snorkeling depth, all encountered as the party took the shortest distance between two points. The ponies were quickly moved to safe positions, shepherded by a full screen of dipchicks operating brilliantly with sudden alterations of course and speed as 'signalled' by the pony flagship.

On completion of equestrian manoeuvres, the party reformed for the final assault on the galley. A thick scum of coal dust, dead leaves and weeds floated on the water around the door and windows, one of which was open and used to effect an entry.

Chef's mobile 'dish and chow' carrier was floating against the wall halfway up the building, with an anchor down in the vicinity of the coal bunker. Using the chef's bike (conveniently propped against the wall under the window) as a 'first stop with safety', all hands boarded the galley and witnessed a scene that

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would have made Charlie Drake envious. Pots, pans, dishes, vinegar jar, sauce bottle, crockery, etc. were hanging from knobs balanced on ledges, door frames and angles of rafters, all above high water mark. The cooking range, almost at periscope depth was merrily giving off clouds of steam like a drop keel tickler machine with too much back E.M.F. Plates were clinking together like castanets, as they bobbed around in the water, the frying vat heavily waterlogged bumped dolefully against the disused second range (a relic of the days when sailors used wooden tin gear) monotonously spilling a mixture of water and fat over the framing.

The fire door of the range was coffer-dammed with meat dishes and cloths in a most ingenious manner and chef's grappling irons were hanging from a life-line stretched across the galley from two convenient points of attachment. Naturally, the piece-de-resistance was slap bang in the middle of things, to wit, Leading Cook Ginger Porter in number eight shirt, underwear and seaboots, standing on a table (which was riding to a four point moor) passing the gripes around dishes of food, each dish hoisted on its own set of falls secured to the rafters. With a mixed look of triumph, frustration and anger, Ginger, looking like one of Boadiceas outriders, his legs blue with cold, begun explaining to Sir Hook the sequence of events as applicable to himself and his domain. 'I was carrying on as usual Sir, when the bloody door suddenly crashed open and in came the flipping ocean. I was swept across the galley fighting off an attack by two dishes of spuds, one of onions and a fanny-full of soup. With the water level rising over since, I have been busy salvaging, clearing up, trying to prepare lunch for the Officers and dinner for the men Sir,

my pants are on the top of the range drying and my flipping legs are frozen'. Pausing for a flush through, Ginger gazed sadly around and thoughtfully added, 'I'm afraid the galley is in a bit of a mess Sir'. This under statement of fact just about brought the house down and the next few minutes were hilarious to say the least. 'Not to worry chef' quoth Sir, 'We'll soon have it cleared up'. Easier said than done, although mighty were the efforts of all during the following hours. Many were the chuckles. For instance, as one hand made to open the door to the main dining room, chef yelled 'Don't open that door you'll let all the water in'. With a shamed look the lad quickly removed his hand from the door knob before realising that the position of the door would have no possible effect on the state of the water. A youngster squeegeeing the top of the table dropped the head in the water, bent to pick it up and flooded his suit — clot had taken off his hood and neck ring. The queue of frog-suited would-be diners wading towards chef, standing on his table and doling out food from on high, into plates held up to him as if in supplication. Same crowd dispersing to various points of 'safety', doing their respective best to hang on, balance a plate of food(?) and manipulate a mixed outfit of grappling irons all at the same time—just like a convention of left-handed Patagonian tripe-dressers on half pay. Needless to say, the English language as she is spoke, went completely by the board and Porter stood no nonsense from any of the 'foreign speaking students'. Giving as good as he received, in fact better, as the follow-will bear witness:— 'This is a flipping rought bit of meat' complained one laddie (as he eyed a section of beef obviously from just below the hoof of a veteran animal). 'What do you

expect in a businessman's lunch, tea-bone steak?' cracked chef. 'I don't grow it, I only cook the bloody stuff'. 'Ginger, I have only three spuds' snarled another dissatisfied customer. 'You're lucky, Noah only had two in his Ark' was the swift retort.

To cut a long story sideways, the customary sumptuous banquet daily enjoyed in 'Porters "Do it Yourself" Eating Establishment' was something below par on this momentous day (customers had the usual choice — take it or leave it), although under the trying circumstances it was freely admitted by one and all that Ginger had lived up to Sirs' maxim of always 'Keeping a level head' and had made a very good effort all round. A unanimous vote of full marks to our gallant culinary expert determined Sir to recommend him for an extra 'tot' as some small recompense for 'Arduous and hazardous work above and beyond the call of duty'. Unfortunately when Ginger finally returned to *Vernon* the duty rum Bos'n

had completed his chore of dispensing the wine that cheers, and poor chef had had it. To make up for the loss, the boys decided to have a whip wound of a 'fiver' per head (perhaps) on pay day, to buy a firkin of scrumpy.

Innoculations are going ahead apace to guard against the possible effects of wee beasties, etc. which may have found their way into the 'standing' soup pot. Although Ginger swears that all this extra meat is very good for the boys, Pancho Powis has sworn off 'Porters Pot of Special Vitamin Soup Prepared for Power Driven Divers' and told chef what he can do with it—pot included.

NOTE.—For the duration of the Monsoon, Sir has graciously given members permission to discard mess undress and replace it with under water swim suits mark one fitted with 'soup' inflation.

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The following Letter was received by the Editor:—

A friend of ours who has come home from abroad has engaged himself in an unusual hobby. He collects toilet paper, and as one would invite their friends to see the family album he reverently invites them to see his paper album. This comprises of all sorts, shapes and sizes of toilet paper with the name, date and place it comes from.

Arriving in London after much haggling at the airport about bringing foreign matter into the country he decided he'd go to the Houses of Parliament to find out just what the Heads of State were using. The question on hand being which kind? the soft gentle safe for babies type, the superior de-luxe model that has just reached our shores direct from

America, or was it that good strong thoroughly British kind our nation has been raised up on? So, nothing undaunted our diver set off.

After much manoeuvring and furtive peering about, aided and abetted by most willing assistance they reached the members private quarters and then the 'members only'. In went our hero and at once there was a wailing and gnashing of teeth seldom heard this side of the world, and out he came, tears in his eyes, a look of incredulous disbelief on his face and handed over the prize. The one piece of paper that was to have the place of honour in his collection. A single sheet bearing the words 'GOVERNMENT ISSUE'.

* * *

DISILLUSIONMENT

This is the tale of Diver Nobby
 Who had a most unusual hobby.
 Instead of stamps and that kind of
 caper,
 He used to collect odd kinds of paper.
 He filed each bit with loving care,
 Noted colour — texture — strength
 of tear;
 Then journeyed on with look intense
 To search again in the next GENTS.
 He wandered on to look for more
 From Pompey right to Singapore.
 His collection was a thing of pride
 Yet never was he satisfied.
 He found paper of different hues,

Sometimes bits of Daily News.
 In Diving School, though obsolete,
 He found S9's upon the seat.
 One day on leave, my tale records
 He wandered through the House of
 Lords.
 This, he thought, is simply grand
 Here sit the highest Peers in the land,
 He found upon a certain wall
 The name of 'Edith' written small.
 His eyes lit up, he searched with zest
 The paper here *must* be the best.
 But disappointment and surprise
 Brought tears of chagrin to his eyes.
 Instead of paper with perfect tissue
 There were little buff squares, maked
 'GOVERNMENT ISSUE'.

Solution to Divers' Crossword

Across:—(1) Proofed; (2) Aspects; (8) Refit; (9) Gross; (11) Fear; (13) Thin;
 (14) Midwife; (15) Credit; (17) Extras; (18) One; (20) Dock Green; (23) Era; (26) Unreel;
 (28) T.T. Race; (29) Runners; (30) C.A.B.A.; (32) Wilf; (33) Bungs; (34) Muses;
 (35) Mixture; (36) Matthew.

Down:—(1) Perfect; (2) Over; (3) Elicit; (5) Strife; (6) East; (7) Shine so; (8) Raged;
 (10) Share; (12) Owing Rent; (14) Mid-over; (15) Expects; (18) Oke; (19) E.R.A.;
 (21) Fulcrum; (22) Crabb; (24) Paris; (25) Set Flow; (27) Lugger; (28) Trauma; (31) Aunt
 (32) West.

APPEAL

If any of our readers have any of 1956 and 1957 editions of the R.N. DIVING MAGAZINE they wish to dispose of, will they please get in touch with J. PAYNE, Esq., 67 Bewick Crescent, Newton Aycliffe, Nr. Darlington, Co. Durham.

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