

(sic) ready for the day when they can be made available, under a seal of confidentiality such that legal processes cannot breach, to some central pool of information. So please start to keep YOUR notes NOW. In diving more than any other activity, the old homily tells it all:

'It ain't what you don't know that hurts
you most, it's all them things you do
know that ain't so'.

Now read on, and safe diving.

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Experimental proof of the Laws of Reflection

There is at least one more convert now to a belief in the applicability of the laws of Reflection under aqueous conditions, and you will be pleased to hear that he has fully recovered and is back at work.

Our Experimenter had a fine new Nemrod compressed air speargun and was just itching to kill something nice and big with it. But nothing seemed willing to volunteer for this signal honour. It seemed rather a pity not to christen the bang-stick, so a rock was selected as the target. BANG! Spot on! Ooch!!! Yes, you couldn't do it if you tried but he had hit that rock dead on at 90° and had the rare privilege of a front row seat to watch that spear-shaft retrace its path exactly. It was a pity he was still in-situ, as it were, for it returned to his arm. Luckily, not only did it deflect from a bone without causing a fracture but his buddy and the dive boat were nearby. A few stitches and he was ready to give his lecture on safe diving.

MORAL: Remember always that your actions may reflect on you adversely!!

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THE INSTITUTE OF DIVING MEDICINE

Dr RAF Cox

Introduction

The history of the medicine of diving is, in a sense, the history of the development of diving itself. While diving was concerned primarily with shallow water work, it was appropriate that the diving medical examinations should also be part of the local General Practitioner's practice in his capacity as an Appointed Factory Doctor, who was authorised to sign the diver's "Blue Book" and thereby license him within the confines of the Factories Act to pursue his occupation. As diving has extended outside the controls exercised by this Act, ie. beyond the three mile limit, and also at increasing depths, the physiological demands placed upon the modern diver have increased, and in turn have created a need for a developing specialisation in medicine to provide the necessary diagnostic and therapeutic skills.

In practice the natural development of the industry has localised the demands to those places which have acted as centres from which diving operations have been conducted.

The first of these focal points in the North Sea was at Great Yarmouth and, beginning in 1966, has created an increasing demand for medical examinations of this nature. Thus, for example, during this period about 900 diving medical examinations have been completed routinely, both during the diver's working life and in those cases where illness or injury has terminated his career.

The past two years have seen a dramatic increase in the pace of offshore exploration in the North Sea, stimulated by economic and political pressures and, with this, a demand for divers to reach the increasing depths at which drilling is now taking place and from which production will be maintained. As a consequence, many of the complications of diving - decompression sickness aseptic bone necrosis, acoustic and vestibular barotrauma, hypothermia, etc. - have assumed a much greater importance, thus creating greater demands on the expertise of those few medical practitioners trained and experienced in this field. To the present time such demands at Great Yarmouth have been incorporated in a growing general medical practice, although, for obvious reasons, outside the purview of the National Health Service. It has now become apparent that these requirements are such as to necessitate the provision of a separate organisation if they are to keep pace with the developments fit underwater medicine.

A deficiency of the present state of affairs is that there is no centre, in this country or elsewhere, to which reference can be made for up-dated, authoritative advice and expertise, based on codified information which would laid to improved standards in the practical medical care of divers. Neither is there a centre where factual information on divers' health is available to provide the vital basis for quantification of risks, which is fundamental to an effective insurance facility to safeguard both diver and employer. Hitherto, such arrangements as have been available for the provision of immediate skilled medical advice in times of emergency have depended upon ad hoc arrangements between diving companies and a few individual doctors, who in turn have drawn on the only other available source of expertise in this field, which has been so willingly provided by the Medical Officers of the Royal Navy. The numerous deficiencies inherent in this arrangement include the difficulty of contacting the appropriate person or persons, the absence of a focal point of reference to gather and to make immediately available the appropriate information, and the lack of continuity in the management of diving emergencies. A further feature is the need to expand the basic facilities which exist at the present time to meet the increasing demand which is forecast in this field.

Discussions with a wide variety of interested and affected persons and bodies, including the Department of the Medical Director-General (Navy), the Chairman of the Medical Research Council Decompression Sickness Panel, the Department of Energy, the Department of Employment, Members of Parliament, oil companies, diving companies, divers, insurance underwriters at Lloyds, and medical practitioners engaged in the field of underwater medicine, both in the UK and abroad, have resulted in the establishment of an organisation to be called 'Divers Medical Centres' and incorporating the Institute of Diving Medicine. This has been warmly welcomed by all those consulted.

Functions

The terms of reference of the Institute include:

- (i) Provision of an "expert advisory service" on a 24 hour basis for diving emergencies. This will require the Institute to maintain an up-dated index

of world authorities on all aspects of hyperbaric medicine, which will be immediately available for its medical officers.

- (ii) To keep a register of divers, to which admission will be renewable annually, following a routine medical examination by one of the Institutes appointed medical practitioners. This will enable the diver to establish his medical fitness to an employer's satisfaction.
- (iii) To perform routine medical examinations of divers according to the standards laid down in the ClRIA Code of Practice.
- (iv) To keep all divers' medical records within clinical confidentiality.
- (v) To act as a focal point for research and the collection of data and the exchange of information on the medical problems of diving. Also to provide a library of books, journals, and other publications referable to the medical problems of diving.
- (vi) To co-ordinate the investigation of diving accidents and provide appropriate and independent reports to affected parties.
- (vii) To provide or obtain expert witnesses, when required.
- (viii) To provide instruction in diving medicine, especially for oil rig medical orderlies.

The Institution and Diving Medical Centres will maintain close liaison with those academic centres involved in hyperbaric research, but it is important that they should remain independent, in order to retain the goodwill of the divers, for whose benefit they are primarily being established. For the same reason it will be essentially a practical Institution, whose main function will be to provide practical advice on day to day problems, particularly decompression sickness, as well as being an instrument through which controls of the medical aspects of diving can be exercised.

Diving Medical Centres and the Institute have been established on the basis of the existing facilities at Great Yarmouth, which include a nucleus of four trained doctors, whose experience in providing emergency consultation of the kind described in paragraph (i) above has successfully met the demands of the past eight years. This has also resulted in the accumulation of the largest and most comprehensive data bank of case histories and records, relating to some 900 commercially-employed divers.

Provision must obviously be made to cope with the shifting centres of influence of offshore exploration, construction and production. Plans have already been agreed to establish a Diving Medicine Centre at Aberdeen to meet the needs of divers in the Northern North Sea. It is envisaged that further centres will be required at other locations of intensive offshore activity.

The policy of the organisation will be directed by a Medical Advisory Board, chaired by Professor Dennis Walder, and consisting of representatives of the country's foremost experts in the various aspects of underwater medicine.

Membership

The Institute, which has been established as a non-profit making organisation, will

derive its income from membership fees and subscriptions. Its facilities and the results of its research will be made available to its members, who will among other advantages, receive the benefits of insurance cover at reduced rates of premium.

The demands which are being and will increasingly be made on the Institute will best be served by the establishment of four separate but inter-related classes of membership.

- (i) A limited number of companies and other organisations have been and are being invited to subscribe to or accept founder membership.
- (ii) Corporate membership is open to any trading company or body corporate involved or interested in the employment of divers.
- (iii) Membership will also be offered to governmental departments, commercial or trading bodies or persons sponsoring particular aspects of research by the Institute.
- (iv) Subscribing membership will be confined to individual divers and diving personnel.

It is estimated that the annual budget will be not less than £100,000.

The Institute is already engaged in analysing the medical records which it possesses, in order to quantify insurance risks more accurately and its current activities also include the training of doctors in emergency procedures based on the latest advances in this field.

Conclusion

The establishment of an Institution of this nature, must of necessity, leave many imponderables in a field which is so relatively unexplored as that of underwater medicine. The size, scope and complexity of the Institute's activities must be so designed as to meet the full demands of an expanding industry, upon which the economic and political future of the UK is so dependent, in the last quarter of the Twentieth Century. Certainly the experience of the past eight years has indicated the profound need for a unique centre based on informed and up-dated information and expertise which can reduce the trauma and unnecessary tragedy. It is our firm belief that the Institute of Diving Medicine will offer such a facility.

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The Department of Energy Statute, Offshore Mineral Workings Act Special Diving Regulations 1974, become effective from 1 January 1975. Among other things they specify that a diver shall have a medical examination performed by one of a number of approved doctors throughout the UK, and they define standards. The approved doctors, and all those working in the Institute of Diving Medicine are so approved, are licensed by the Medical Branch of the Department of Employment. Any doctor wishing to be so approved has to satisfy the Department of Employment that he has had sufficient instruction and practical experience in underwater medicine to be competent to conduct medical examinations of commercial divers to the standards laid down under the new Act. There is at the moment no Examination or Diploma or statutory

qualifications to which a potential appointed doctor must aspire before he can be appointed. Each one is considered on his merits by a panel of Government Appointed Doctors, who in turn are advised by those senior members of the profession whose knowledge and expertise in the field is without question.

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Appendix

REPORT ON MEETING HELD TO DISCUSS THESE PROPOSALS (12 September 1974)

Dr Cox outlined the need for such an Institution and described how he and his colleagues at Great Yarmouth had been providing a service for the diving industry for the past eight years which could form the bones of the Institute. They held medical records of approximately 700 divers, which contained information from some 1,200 medical examinations and 425 consultations in connection with diving. He said that, in effect, the Institute had been operating for the previous 8 years and the intention now was to put it onto a more formal and financially sound basis so that it could expand its activities and extend the services which it was already offering. He described the support already received from a great many bodies and, in particular, the support which was promised from the insurance industry. The Institute would be in existence and operating from a number of different centres, wherever it was required, including Aberdeen immediately.

Dr Cox confirmed that a working partnership existed with the Respiratory Physiology Unit of King's College Hospital and that a number of research projects were being considered.

Prof. Walder then spoke, welcoming the initiative that led to the formation of the Institute and endorsing the need for such an organisation, which was vital to the diving industry. He stressed the need for it to be operational in a number of centres but with a single headquarter.

Mr David Price, Financial Adviser to the Institute, said that the estimated cost would be between £100,000 and £200,000 per annum to run it and to finance its researches. It was intended to obtain this from the industry on the basis of the benefits that would result to both the divers and those employing them. He suggested several possible means of subscribing both by individual divers and companies. A full medical examination and licencing as fit to dive, in line with the proposed Government legislation, would probably cost £100 per annum.

During the discussion that followed Dr Cox said that divers on the list at the Institute would have lower Insurance rates and therefore be less expensive to employ. He had discussed the proposals in the USA and at the recent Conference in Copenhagen and had no doubt that in time there would be an international organisation.

Mr J Dawson of CT Bowrings welcomed the Institute from the underwriters' point of view. He stressed that at present the Medical aspects of diving were quite unevaluated from the insurance aspect and the Institute would enable this situation to be put right.

Commander T Lovell-Smith endorsed this and emphasised how, at the present time, the medical screening aspect was particularly difficult to assess.

Commander David Elliott welcomed the Institute and emphasised the importance of medical standards and of a need for a co-ordinated Emergency and Information Service. He welcomed the prospect of the research activities and asked for clarification on the point of the training of doctors. Dr Cox replied that he envisaged that the training of doctors was only to ensure that they were able to perform medical examinations of divers to the standards set by the Institute.

Commander Warner, Department of Energy, welcomed the Institute but queried the wording of the function relating to the investigation of accidents, since this was a statutory duty of his Department. Dr Cox said there was no question of usurping this, rather that it was seen as a means of co-operating to ensure that the medical aspects were fully considered.

Dr Colin Jones of UK Operators Offshore Association welcomed the initiative. Mr John Prescott, MP, expressed concern at the reluctance of companies to show their hands with regard to contributions. He felt that if the industry itself did not finance the Institute, then it was likely that the Government would need to step in. Mr Peter White of Ocean Technical Services Ltd. complimented the service presently being provided and noted that Insurance premiums were currently very high. He wondered whether the Institute's activities would be able to reduce them. Dr Cox said that there had been long discussions with the insurance market and there was no doubt that accident cover premiums would be able to be reduced, although employers liability was a slightly more difficult matter.

Mr Dearman, Northern Divers Ltd., asked about the reaction of divers themselves to the Institute. Dr Cox replied that as there was no representative organisation on behalf of divers, it was difficult to approach them as a body and get their views.

Since this meeting further discussions have been held with a number of interested people and the current situation is that a doctor has been retained to analyse urgently the ECG tracings held by the Institute and that active negotiations are being undertaken regarding several other research projects. Financial support has been promised from a number of companies and active discussions are in progress to produce firm figures of the insurance advantages offered to companies or individual divers on the Register.

SNIPPITS

NOTICE on a computer in London:

ACHTUNG
ALLES LOOKENPEEPERS

Das computermachine ist nicht fur gerfingerpoken und mittengrabben. Ist easy schnappen der springenwerk, blowenfusen und poppencorken mit spitzensparken. Ist nicht fur gerverken bei das dummkopfen. Das rubbernecken sightseeren keepen hands in das pokets - relaxen und wach das blinken-lights.

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SURVEY UNDERWAY ON BONE NECROSIS

LCDR George M Adams, MSc, USN
Faceplate Vol. 5, No. 3

While diving is considered a reasonably safe endeavour, knowledgeable participants maintain an awareness of various potential hazards. The unexpected occurrence of decompression sickness on a "safe" decompression table is an ever present possibility; the enhanced possibility of decompression sickness from deeper and/or longer dives is well documented. Air embolism from improper exhalation while surfacing is always possible. Barotrauma with resultant ear and/or sinus involvement is also a constant possibility in any dive. While these possibilities are always present, they are all therapeutically manageable if adequate planning and precautions are taken.

There are diving problems that are not always recognized. Hearing loss and deafness have been recognized as possibilities that are under investigation for understanding, management, and prevention. The long-term consequences of central nervous system involvement in diving accidents are also of increasing concern. Currently being evaluated are the possible effects of diving on a diver's hones.

Bone abnormalities with the characteristics of aseptic bone necrosis or dysbaric osteonecrosis have been found in divers throughout the world. A survey for the presence of bone abnormalities, as determined by X-ray techniques, has been in progress in the US Navy for a number of years. In accordance with recent requests from the Diving Research Branch, Naval Submarine Medical Research Laboratory (NAVSUBMEDRSCHLAB), a number of active duty divers have been and are being surveyed radiologically for the presence of bone abnormalities. Various facts are gradually becoming evident from this survey.

Bone abnormalities consistent with the characterization of dysbaric osteonecrosis or aseptic bone necrosis have been found in some active duty divers. The exact percentage of cases is not yet known, but the occurrence of disabling bone abnormalities appears to be quite low (less than 0.45 percent). One or more incidents of decompression sickness do not seem to predispose the diver to the occurrence of bone abnormalities; nor does a diver's age appear to be related to the occurrence of this condition (within the normal age range of divers). No apparent correlation between the occurrence of bone abnormalities and the diver's NEC designation has been established for NEC's 5311, 5342, 5343 and 8493. These conclusions are based on preliminary data and will require additional input for verification. The causative factors that lead to the occurrence of bone abnormalities are not known at this time.