in Underwater Science

New Series) of the Report of the Underwater Association. s of the 10th Symposium of the Underwater Association, at Museum (Natural History), March, 1976. Edited by K. d A. D. Baume.

abratory and SCUBA studies on the behaviour of the freshwater repotamobius pallipes (Lereboullet). Food and habitats of predatory coral reefs. The distribution of two closely related species of Tellina Dosta and T. fabula Gmelin). A methodology for primary surveys of the toral zone. Marine wildlife conservation. Intrepretation of the 1975 Loch a. On the use of sonar in Loch Ness searches. Discussion on the Loch menon. Ancient harbours of Carthage. Historic wreck sites and their Advanced underwater television and photographic systems. A cheap lique for epifaunal surveying using a small boat. A mini cassette use by divers underwater

1605 2 144 pages illustrated

ments in Water Resources

s of the International Conference held at Princeton University, uly 1976, edited by W.G. Gray and G.F. Pinder, Princeton and C.A. Brebbia, Southampton University.

ngs contain the 48 Papers presented at the Conference together with the sision. Topics covered included subsurface flow simluation (seepage, blems, well hydraulics, mulitphase flow, aquifer simulation, geothermal sysis), surface flow simulation (estuary and lake modelling, ocean dynamics, annel flow), hydrodynamics, atmospheric simulation and basic finite element

0 7273 06014 1050 pages Illustrated

Criteria for Estuaries

s of the Symposium held at the University of Southampton, edited by P.R. Helliwell and J. Bossanyi, University of

ne Conference was to suggest criteria to be used in monitoring the health of les which are not grossly polluted. The importance of aesthetics and the value of unpolluted water, the existence or absence of health hazard in uted water and the role of bacteriological criteria in this connection are t length. The organizational framework for estuary pollution control and the ling are dealt with.

73 1601 X 346 pages Illustrated

Volume 3 New Series of the Report of the Underwater Association

PROGRESS IN UNDERWATER SCIENCE

Edited by J. C. Gamble and R. A. Yorke

A State of the south



Metruckor No. 12653



Albrecht Salm

Progress in Underwater Science

Volume 3 (New Series) of the Report of the Underwater Association

Proceedings of the 11th Symposium of the Underwater Association, at the British Museum (Natural History), March 18–19th, 1977

Edited by

J. C. Gamble, DAFS Marine Laboratory, Aberdeen

R. A. Yorke

PENTECH PRESS London : Plymouth

Preface

"PROGRESS IN UNDERWATER SCIENCE" aims to serve as a forum for communication between those of us who use diving techniques as a serious tool in our research. This third volume of the New Series illustrates the wide spectrum of interests within the scientific diving fraternity.

All papers except one, were given at the Annual Symposium of the Underwater Association held at the British Museum (Natural History) in March 1977. However, to encourage contributions from members and others from overseas who cannot attend the symposium, we have great pleasure in publishing an important review article by Dr F. M. Davis, of Christchurch Hospital, New Zealand.

Maritime archaeology is a subject whose growth is directly correlated with the development and availability of SCUBA techniques. Whereas the article on the Israel coastline links geology and archaeology this volume also contains progress reports on investigations into the lost medieval city of Dunwich and on excavations of Roman, Tudor and Spanish Armada wrecks.

Techniques are described for the detailed photogrammetric study of marine sediments. Also included is a major contribution on the sea level changes of the Israel coastline during the last 9000 years. In the biological sciences this volume contains contributions ranging from autecological studies on sea urchins to the problems of conservation in the Red Sea.

The Underwater Association is naturally very interested in the health and safety of the diver. The Report includes several articles in this field ranging from a critique on the treatment of aqualung cylinders to a review of the perennial, but serious, problem of hypothermia. We are also particularly pleased to include Dr Hennessy's paper on his outstanding re-appraisal of decompression prediction.

Conventional diving practices have tight limitations on depth and endurance, consequently any forward-looking body must consider how these can be extended. The 1977 Symposium included a session on the use of the submersible which does indeed extend the scope of the diver. This volume includes three contributions on this subject ranging from a description of a simple towed wet submersible designed for studying fishing gear in action to a discussion of safety measures involved in the use of a large commercial vessel.

To reiterate, we feel that this Report of the Underwater Association fully reflects the wide ranging interests of its members and of all of those who use diving as a serious technique. The editors make no apology for the range of style and format of the contributions: this too is indicative of the broad impact diving techniques have in current aquatic research.

John Gamble Robert Yorke

CONTENTS

ARCHAEOLOGY	Page
Rule, M. The Mary Rose, an interim report, 1977	1
Martin, C. J. M. La Trinidad Valencera – an interim summar	y 9
Tchernia, A. Roman wreck of La Madrague de Giens	19
Bacon, S. R. Ancient Dunwich, Suffolk's lost city	25
GEOLOGY	
Flemming, N. C., Raban, A., and Goetschel, C. Tectonic and eustatic changes in the Mediterranean coast of Israel in the last 9000 years	33 he
Max, M. D. and Cathcart, G. S. Geological diving centred on Dublin Bay	95
Moore, E. J. Underwater photogrammetry	101
BIOLOGY	
Price, J. H. and John, D. M. Subtidal ecology in Antigua an Ascension: A comparison	di 111
Bullimore, B., Dyrynda, P. E. J. and Bowden, N. The effects of falling temperature on the fauna of Swansea docks	f 135
Rodhouse, P. G. and Tyler, I. D. Distribution and production indices of the sea urchin Echinus esculentus L. in the shall sublittoral around Lundy	147 ow

	Page
Ormond, R. F. G. Requirements and progress in marine conservation in the Red Sea	165
Lockyer, C., Flewellen, C., Madgwick, A. and Morris, R. Some fiel observations and experiments on a bottlenosed dolphin	l d 177
PHYSIOLOGY AND PSYCHOLOGY	
Davis, F. M. Immersion hypothermia in SCUBA diving	191
Godden, D. R. Surface training for underwater work – is it sometimes worse than useless?	205
Chemin, P. Experimental and open water dives at COMEX, the practical differences at 2001 ft	213
Hennessy, T. R. Recent advances in decompression prediction	219
TECHNOLOGY AND SUBMERSIBLES	
Greenhough, J. M. Pressure vessels used in sub aqua diving – their problems and maintenance	241
Main, J. and Sangster, G. I. A new method for observing fishing gear using a towed wet submersible	259
Pardoe, Cdr. J. R. Diver lock-out and other submersibles – safety and rescue	269
Vilson, J. B. Ecology and sedimentology from manned submersibles	275