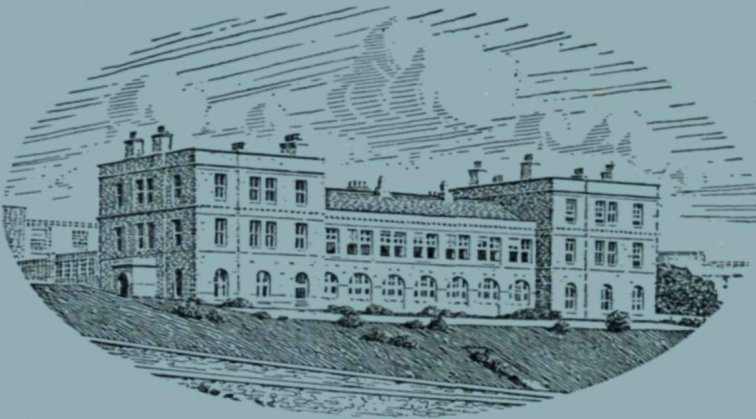


**JOURNAL OF THE
MARINE BIOLOGICAL ASSOCIATION
OF THE UNITED KINGDOM**



THE PLYMOUTH LABORATORY

VOLUME XXIX, No. 3
(issued February 1951 and completing Volume XXIX)

**CAMBRIDGE
AT THE UNIVERSITY PRESS
1951**

Price Twenty-two Shillings and Sixpence net

MARINE BIOLOGICAL ASSOCIATION OF THE UNITED KINGDOM

PATRON

HIS MAJESTY THE KING

OFFICERS AND COUNCIL

President: Prof. J. GRAY, C.B.E., M.C., Sc.D., LL.D., F.R.S.

Vice-Presidents

The Earl of IVEAGH, C.B., C.M.G.

Viscount ASTOR

Sir NICHOLAS E. WATERHOUSE, K.B.E.

Col. Sir EDWARD T. PEEL, K.B.E., D.S.O.,
M.C.

The Right Hon. TOM WILLIAMS, M.P.

G. P. BIDDER, Sc.D.

W. T. CALMAN, C.B., D.Sc., F.R.S.

Vice-Admiral Sir JOHN A. EDGELL, K.B.E., C.B.,
F.R.S.

Prof. A. V. HILL, C.H., O.B.E., Sc.D., F.R.S.

E. S. RUSSELL, O.B.E., D.Sc.

Sir EDWARD J. SALISBURY, Kt., C.B.E., D.Sc., Sec.R.S.

Admiral Sir AUBREY C. H. SMITH, K.B.E., C.B.,
M.V.O.

A. T. A. DOBSON, C.B., C.V.O., C.B.E.

Honorary Members

Dr G. P. BIDDER

Dr H. B. BIGELOW

Dr R. DOHRN

Dr TH. MORTENSEN

Prof. HANS PETERSSON

Prof. H. U. SVERDRUP

COUNCIL

Elected Members

ANNA M. BIDDER, Ph.D.

Prof. F. W. ROGERS BRAMBELL, D.Sc., F.R.S.

J. N. CARRUTHERS, D.Sc.

G. E. R. DEACON, D.Sc., F.R.S.

E. FORD

F. C. FRASER, D.Sc.

MICHAEL GRAHAM, O.B.E.

Prof. J. E. HARRIS, Ph.D.

A. L. HODGKIN, F.R.S.

O. D. HUNT

C. E. LUCAS, D.Sc.

L. HARRISON MATTHEWS, Sc.D.

J. D. H. WISEMAN, Ph.D.

Prof. V. C. WYNNE-EDWARDS

Prof. C. M. YONGE, D.Sc., F.R.S.

Governors

G. P. BIDDER, Sc.D.

H. J. JOHNS, C.B., M.B.E. (Ministry of Agriculture
and Fisheries)

The Worshipful Company of Fishmongers:

The Prime Warden

Major E. G. CHRISTIE-MILLER

HARRISON S. EDWARDS

Prof. A. C. HARDY, D.Sc., F.R.S. (Oxford University)

Prof. J. E. SMITH, Ph.D. (Cambridge University)

EDWARD HINDLE, Sc.D., F.R.S. (British Association)

H. W. PARKER, D.Sc. (Zoological Society)

Prof. A. V. HILL, C.H., O.B.E., Sc.D., F.R.S. (Royal
Society)

Hon. Treasurer: Major E. G. CHRISTIE-MILLER, 38 Hyde Park Street, London, W.2

Secretary: F. S. RUSSELL, D.S.C., D.F.C., F.R.S., The Laboratory, Citadel Hill, Plymouth, Devon

SCIENTIFIC STAFF

Director: F. S. RUSSELL, D.S.C., D.F.C., B.A., F.R.S.

Head of Department of General Physiology: W. R. G. ATKINS, O.B.E., Sc.D., F.R.I.C., F.Inst.P., F.R.S.

H. W. HARVEY, Sc.D., M.A., F.R.S. (*Hydrologist*)

G. A. STEVEN, B.Sc., F.R.S.E. (*Zoologist*)

D. P. WILSON, D.Sc., F.R.P.S. (*Zoologist*)

L. H. N. COOPER, D.Sc., F.R.I.C. (*Chemist*)

G. M. SPOONER, M.B.E., M.A. (*Zoologist*)

MARY W. PARKE, D.Sc., Ph.D. (*Botanist*)

J. S. ALEXANDROWICZ, Ph.D., M.D., (Jena) (*Histologist*)

P. G. CORBIN, B.A. (*Zoologist*)

H. G. VEVERS, M.B.E., M.A., D.Phil., F.Z.S. (*Bursar
and Zoologist*)

J. A. C. NICOL, B.Sc., M.A., D.Phil. (*Experimental
Zoologist*)

J. LOWY, B.A. (*Experimental Zoologist*)

N. A. HOLME, B.A. (*Zoologist*)