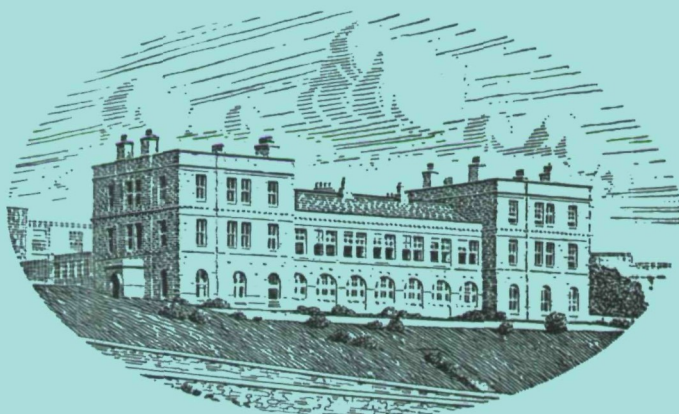


JOURNAL OF THE
MARINE BIOLOGICAL ASSOCIATION
OF THE UNITED KINGDOM



THE PLYMOUTH LABORATORY

VOLUME 34, No. 1

(issued February 1955)

CAMBRIDGE
AT THE UNIVERSITY PRESS
1955

Price Thirty-two Shillings net

MARINE BIOLOGICAL ASSOCIATION OF THE UNITED KINGDOM

PATRON

H.R.H. THE DUKE OF EDINBURGH, K.G., K.T., F.R.S.

OFFICERS AND COUNCIL

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

Vice-Presidents

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

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

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

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.

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.

Major E. G. CHRISTIE-MILLER

MORLEY H. NEALE, C.B.E.

The Earl of VERULAM

Honorary Members

Dr H. B. BIGELOW

Dr R. DOHRN

Prof. LOUIS FAGE

Prof. HANS PËTTERSSON

Prof. H. U. SVERDRUP

COUNCIL

Elected Members

Miss ANNA M. BIDDER, Ph.D.

Prof. H. GRAHAM CANNON, Sc.D., F.R.S.

J. N. CARRUTHERS, D.Sc.

D. J. CRISP, Ph.D.

Prof. H. MUNRO FOX, F.R.S.

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

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

O. D. HUNT

Prof. O. E. LOWENSTEIN, D.Sc.

C. E. LUCAS, D.Sc.

Prof. J. E. SMITH, Sc.D.

Prof. G. P. WELLS, Sc.D.

R. S. WIMPENNY

Prof. V. C. WYNNE-EDWARDS

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

Governors

R. G. R. WALL (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)

S. 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, C.B.E., D.S.C., D.F.C., F.R.S., The Laboratory, Citadel Hill, Plymouth, Devon

SCIENTIFIC STAFF

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

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

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

G. A. STEVEN, D.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*)

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

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

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

D. B. CARLISLE, M.A., D.Phil. (*Endocrinologist*)

G. R. FORSTER, B.Sc. (*Zoologist*)

Miss D. BALLANTINE, B.Sc. (*Botanist*)

B. C. ABBOTT, B.Sc., Ph.D., A.Inst.P. (*Special appointment: Biophysicist*)

February 1955