

## APPENDIX.

## The Work and the Aims of the Marine Biological Laboratory.

~~G. O. Whitman.~~

The Marine Biological Laboratory of Woods Hole combines the functions of a research laboratory with those of a school. While it differs thus from the Marine laboratories of Europe, it may also be said to take a somewhat exceptional position among American sea-side laboratories, both in its organization and its scope of work. It supplements the work of the biological departments of the schools and colleges, and at the same time serves as a scientific centre for investigation. It provides not only for general courses of study in zoology and botany, but also, -what is of quite exceptional importance- for technical training preparatory to investigation and special instruction and guidance for beginners in investigation. It is this advanced instruction that makes the school tributary to the side of original investigation, in which the work and the aims of the Laboratory centre. Research is the dominating <sup>function</sup> ~~work~~ of the Laboratory; instruction is merely a means to this end.

Although the Laboratory is wholly free from government control, it is truly national in organization and aims. It is governed by a board of trustees, on which the leading colleges and universities of the country are represented. Its officers of instruction and investigation have been drawn from no less than fifteen educational institutions, and its membership had extended to one hundred and thirty one colleges, universities, seminaries, academies, schools, and laboratories.

From the beginning of this undertaking it has been clearly seen that the realization of its aims depended largely on securing the general support of the colleges, and the active co-operation of all who were interested in the foundation of a national marine station. To secure these ends, the clearly defined aims of the Laboratory were made known as

*for united action*

*Arrange these names in this column.*

widely as possible, and the invitation ~~to co-operate~~ was extended to institutions and investigators throughout the country. The result is that during the last session the following eighteen institutions subscribed for rooms and tables: Bowdoin College, Brown University, Bryn Mawr College, University of Chicago, Cincinnati University, Columbia College, Hamilton College, Massachusetts Institute of Technology, Miami University, Missouri Botanical Garden, Mt. Holyoke College, Northwestern University, Princeton College, Rochester University, Smith College, Vassar College, Wellesley College, Williams College. To this list may be added the American Association for the Advancement of Science, as its subscription for next year has been announced.

During the same session forty-one investigators were at work at the Laboratory, thirty three of whom occupied private rooms, while the rest had tables in the general laboratories for beginners in investigation. The whole number of students and investigators was one hundred and eleven, representing seventy-two colleges, universities, and schools, and no less than seventeen states.

To those who by word and example have encouraged co-operation, this record will certainly be gratifying; and perhaps it will be accepted by all as an assurance that good-will and united effort have not been fruitless. For six years the Marine Biological Laboratory has stood for the first and the only co-operative organization in the interest of Marine Biology in America. Gradually it has come to be understood that the creation of such an organization was a step in the right direction. An important need was felt and there was but one way to meet it. That way was co-operative action. It was clearly seen that the government could not be expected to undertake the work. An independent foundation was needed and one removed from all danger of sectional domination. The effort to reach such a foundation through a co-operative organization was no menace to any existing laboratory. Time has shown

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such a foundation through a co-operative organization was no menace to any existing laboratory. Time has shown that the Laboratory was not an unneeded creation. It is no longer necessary to search "the by-ways and hedges" for investigators, but our buildings have to be extended every year or two in order to provide room for them. Each summer now sees a congress of biologists assembled at the Laboratory, and every new-comer learns the value of scientific fellowship.

Had the Marine Biological Laboratory done nothing beyond the creation of a sound co-operative organization, it would at least have fulfilled one all-essential part of its mission. That it has done, and so effectively that it is not likely <sup>to</sup> ~~be~~ be undone.

The record of the Laboratory as a scientific station is shown in the following list of works:

Papers Published.

- ~~H. F. Ashmun Evolution and Heredity Biological Lectures 1890.~~
- H. Ayers A Contribution to the Morphology of the Vertebrate Head.  
Zoological Anzeiger, 1890
- " On the Origin of the Internal Ear and the Functions of the Semicircular Canals and Cochlea.  
Milwaukee, 1890
- " Concerning Vertebrate Cephalogenesis.  
Journal of Morphology, IV. 1890.
- " The Ear of Man; its Past, its Present, and its Future.  
Biological Lectures I. Boston, 1890
- " Die Membrana tectoria, Was sie ist, und die Membrana basilaris, was sie verrichtet.  
Anat. Anzeiger. VI. 1891.
- " A Contribution to the Morphology of the Vertebrate Ear, with a Reconsideration of its Functions.  
Journal of Morphology VI. Nos. 1, and 2, 1892.

- H. Ayers            The Macula Neglecta again.  
                          Anat. Anzeiger, VIII. 1893.
- "                    Über das peripherische Verhalten der Gehörnerven und den  
 Werth der Haarzellen des Gehörorgans.  
                          Anat. Anzeiger VIII. 1893.
- "                    The Auditory or Hair-cells of the Ear and their Relations  
 to the Auditory Nerve.  
                          Journal of Morphology. VIII. 1893.
- H. C. Bumpus        *Bdellostoma dombezy*. Biol. Lectures II. 1893.  
 The embryology of the American Lobster.  
                          Journal of Morphology. V. 1891.
- "                    A New Method on the Use of Celloidin.  
                          Amer. Nat. 1892.
- "                    A Laboratory Course in Invertebrate Zoology.  
                          Providence. 1892.
- Cornelia M. Clapp. Some Points in the Development of the Toad-fish  
 (Batrachus Tau).  
                          Journal of Morphology. V. 1891.
- E. G. Conklin      The Cleavage of the Ovum in Crepidula fornicata.  
                          Zool. Anzeiger. No. 391.
- "                    *The Fertilization of the Ovum*. *Biological Lectures II. 1893.*
- Bradley M. Davis    Development of the Frond of *Champia parvula*, Harv.,  
 from the Carpospore.  
                          Annals of Botany. Vol. VI. No. 24, Dec. 1892.
- E. G. Gardiner      Weismann and Maupas on the Origin of Death.  
                          Biological Lectures I. 1890.
- J. E. Humphrey      Notes on Technique.  
                          Botanical Gazette. XV, 7, 1890.
- E. O. Jordan        The Habits and Development of the Newt.  
                          Journal of Morphology. Vol. VII. No. 2, 1893.
- J. S. Kingsley      The Ontogeny of *Limulus*. Preliminary.  
                          Zool. Anz. No. 345, 1890, and Amer. Naturalist. 1890

- J.S.Kingsley The Embryology of Limulus.  
Journal of Morphology. Vol. VII, No 1 and, Vol. ~~VII~~<sup>VIII</sup>.  
No. 2.
- " The Marine Biological Laboratory.  
Popular Science Monthly, Sept. 1892.
- Frederic S.Lee Ueber den Gleichgewichtssinn.  
Centralblatt für Physiologie. 1892.
- Wm. Libbey Jr. The Study of Ocean Temperatures and Currents.  
Biological Lectures I. 1890.
- F. R. Lillie Preliminary Account of the Embryology of Unio complanata.  
Journal of Morphology. VIII. No. 3. 1893.
- Wm. A. Locy The Formation of the Medullary Groove and Some Other  
Features of Embryonic Development in the Elasmobranchs.  
Journal of Morphology, Vol. VIII. No. 2.  
The Optic Vesicles in Elasmobranchs and their Serial Relation  
to Other Structures on the Cephalic Plate.  
Journal of Morphology Vol. IX. No. 1, 1893.
- Jacques Loeb Ueber Künstliche Umwandlung positiv heliotropische Thiere  
in negativ heliotropische und umgekehrt.  
Pflügers' Archiv für Physiologie. Bd. 54.
- " A Contribution to the Physiology of Coloration in Animals.  
Journal of Morphology. Vol. VIII. 1893.
- " Investigations in Physiological Morphology. 3.  
Journal of Morphology. Vol. VII.
- " Ueber die Entwicklung von Fischeembryonen ohne Kreislauf.  
Pflüger's Archiv, Bd. 55.
- " On some facts and principles of Physiological Morphology.  
Biological Lectures II 1893.
- J. Muirhead Macfarlane Irrito-Contractility in Plants.  
Biological Lectures II. 1893.
- E. L. Mark Polychaerus caudatus, Nov. gen. et nov. spec.  
Festschrift zum Siebenzigsten Geburtstage Rudolf  
Leuckarts. Leipzig. 1892.



- Julia B. Platt Further Contributions to the Morphology of the Vertebrate  
Head. Anat. Anz. Vol. VI, pp. 251.
- H. F. Osborn. *Evolution and Heredity. Biol. Lectures I. 1890.*
- John A. Ryder Dynamics in Evolution.  
Biological Lectures II. 1893.
- W. A. Setchell Preliminary Notes on the Five Species of Diassansia Cornu.  
Proc. Amer. Acad. XXVI. 1891.
- " An Examination of the Species of the Genus Doassansia Cornu.  
Annals of Botany, VI. 1892.
- Louise B. Wallace The Structure and development of the Axillary gland  
of Batrachus.  
Journal of Morphology, Vol. VIII. No. 3, 1893.
- S. Watase On Caryokinesis.  
Biological Lectures. Vol. I, 1890.
- " The Origin of the Sertoli's Cell (abstract).  
American Naturalist, May, 1892.
- " On the Significance of Spermatogenesis. (abstract).  
American Naturalist. July, 1892.
- " On the Phenomena of Sex-Differentiation.  
Journal of Morphology, Vol. VI. No. 3/ 1892.
- " Homology of the Centrosome.  
Journal of Morphology, Vol. VIII, No. 2, 1893.
- Herbert J. Webber On the Antheridia of Lomentaria.  
Annals of Botany, Vol. V. Apr. 1891.
- Wm. M. Wheeler A Contribution to Insect Embryology.  
Journal of Morphology. Vol. VIII, No. 1, 1893.
- W. P. Wilson The Influence of External Conditions on Plant Life.  
Biological Lectures II. 1893.
- E. B. Wilson Some Problems of Annelid Morphology.  
Biological Lectures I. 1890
- " Origin of the Mesoplast-Bands in Annelids.  
Journal of Morphology, Vol. IV. No. 2, 1890

E. B. Wilson    The Cell-lineage of Nerëis.    A Contribution to the Cytogeny  
of the Annelid Body.

Journal of Morphology, Vol. VI. 1892.

"    The Mosaic Theory of Development.

~~Biological~~ Lectures II, 1893.

C. O. Whitman    "Specialization and Organization"

~~Biological~~ Lectures I, 1890

"    "The Naturalist's Occupation"

~~Biological~~ Lectures I, 1890.

"    "The Inadequacy of the Cell-theory of Development"

Journal of Morphology, Vol. VIII. No. 3 and

~~Biological~~ Lectures II 1893.

"    "A Marine Observatory"

Popular Science Monthly, Feb. 1893.

"    "A Marine Observatory the Prime need of American Biology"

Atlantic Monthly, June, 1893.

"    "The Work and Aims of the Marine Biological Laboratory"

Biological Lectures II, 1893.

"    "The Echinoderm Egg and the Theory of Isotropism"

Journal of Morphology, Vol. IX. 1893.

"    "The Metamerism of Clepsine"

Festschrift zum Siebenzigsten

"    "Geburtstage Rudolf Leuckarts"    Leipzig. 1892.

"    "A Sketch of the Structure and Development of the Eye of  
Clepsine"

Spengel's Zool. Jahrb. VI. 1893.

Papers in Press.

H. Ayers    Bdellostoma dombey.

~~Biological Lectures, 1893~~

- H. Ayers      The Relations of the Peripheral Territory of the Auditory Nerve as shown by Methylen-blue.
- "      Certain Facts and Theories in modern Neurology.
- E. G. Conklin      The Embryology of Crepidula.
- Part I. History of the Cleavage.
- ~~The Fertilization of the ovum.~~
- ~~Biological Lectures, 1893.~~
- "      The Dynamics of Fertilization and Cleavage.
- Elizabeth E. Bickford      Experiments on Regeneration and Heteromorphosis in Tubularian Hydroids.
- Martha Bunting      The Origin of the Sex-cells in Hydractinia and Podocoryne and the Development of Hydractinia.
- Journal of Morphology, Vol. IX. 1894.
- Elizabeth Cooke      On the Osmotic Qualities of the Muscles of Marine Animals.
- E. G. Gardiner      Early Development of Polychaerus candatus.
- Ida H. Hyde      The Nervous Mechanism of Respiratory Movements in Limulus.
- F. S. Lee.      A Study of the Sense of Equilibrium in Fishes. I
- Journal of Morphology - Physiology
- D. J. Lingle      On the Reversal of the Direction of the Contraction of the Heart in Ascidians.
- Jacques Loeb      Ueber das Sauerstoffbedürfniss des Embryo in verschiedenen Entwicklungsstadien.
- "      Ueber die Herstellung <sup>1</sup>Zusammengewachener Doppelt und Mehrfachembryonen by Seeigeln.
- "      Ueber die Bedeutung von Gehirn und Auge für die Reactionen niederer Thiere auf Licht.
- A. J. Morrill      Pectoral Appendages and their Innervation in Prionotus.
- Julia B. Platt      The Ontogenetic Differentiations of the Ectoderm in Necturus. ( Preliminary Notice)

Mary Schively Ueber den Einfluss der Concentration des Seewassers auf  
die Herzthätigkeit einiger Seethiere.

Pflüger's Archiv für Physiologie.

S. Watase On the Nature of Cell-Organization.

Biological Lectures. Vol. II. 1894.

Wm. M. Wheeler Syncoelidium pellucidum, A New Marine Triclad.

Journal of Morphology.

" Planocera inguilina, a Polyclad Inhabiting the Branchial  
Chamber of Sycotypus Canaliculatus Gill.

Journal of Morphology, Vol. IX, 1894.