

## FIRST IMPRESSIONS: AMERICAN BIOLOGISTS AT NAPLES

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### ABSTRACT

This paper examines reactions of American biologists who traveled to the Stazione Zoologica in Naples during the 1880s and 1890s. The 1890s took a number of Americans to Naples despite the development of research resources in their own country. In part this can be attributed to the continued support of the Stazione by those Americans who had first gone, particularly by Whitman, Wilson, and Morgan. The Naples Station continued to exert an important influence on American biologists into the first years of the twentieth century.

### DISCUSSION

In 1881, Professor William Keith Brooks at Johns Hopkins reported that E. B. Wilson's dissertation work would make just as "valuable and handsome a paper as those from Dohrn's laboratory," if only a place could be found to publish it (Brooks, 4 June 1881). This statement revealed two phenomena: first, that the United States did not offer acceptable vehicles for publication of detailed biological work and second, that work at Dohrn's laboratory set a standard for biology by 1881. I wish to focus here on the second of these points. By 1881, the Naples Station had achieved a reputation in the United States for publication and research, but no American student had yet worked there. That situation changed when Charles Otis Whitman arrived in November 1881.

Presumably Whitman had heard about the Station while he was a graduate student studying under Rudolf Leuckart in Leipzig, but his first opportunity to visit Naples came after his three years of teaching at the University of Tokyo (Lillie, 1911; Morse, 1912). On his way back to the United States, he stopped in Naples, hoping to stay a few months. Since he had worked in Germany and since no institution from the United States had subscribed to a table at the Naples Station, Anton Dohrn welcomed Whitman as his guest from November until May 1882 (Lillie, 1911, p. xxiv). Whitman wrote to a friend that he was "having a delightful time at work in the station," and that he found there "greater advantages than are to be found anywhere else in Europe" (Whitman, 23 February 1892). While he had concentrated on leeches in Leipzig and Japan, in Naples he turned to the parasitic dicyemids (Whitman, 1883). Whitman recorded his positive reaction to Naples and Dohrn's Station in an article in *Science*, concluding that the international character of the Station had made it the "Mecca of biologists, and a seat of unprecedented prolific activity." Naples was the place to learn methods, Whitman wrote, and

This one but all-important matter, to say nothing of the many other advantages that must accrue to an occupant of a table at the station,—such as social intercourse, direct knowledge of a very important fauna, and opportunities of acquiring a knowledge of the four languages with which every naturalist must now be familiar,—makes it very desirable, particularly for our younger naturalists, to spend some time at Naples [Whitman, 1883, pp. 94, 95; 1882].

He continued to call for American support of the Station, arguing that even if the

United States had its own laboratory (namely the United States Fish Commission), Naples offered special opportunities.

Another American visited Naples very shortly after Whitman left, as revealed by the records at Naples. Christiane Groeben has compiled a list of those Americans who visited Naples and has identified a number of items in the Archives at Naples for some of those individuals. Groeben reports that Emily Nunn was the second to visit the Naples Station. She had been studying in England and worked at an English table. She later married Whitman, though they did not meet in Naples. Emily Nunn recorded her favorable impressions of the Station, but evidently was advised to gain more experience in independent research before spending more time at Naples so did not stay as long as she had intended (Nunn, 1883; Groeben, 1984). Whitman was certainly the more important American visitor as far as Dohrn was concerned.

That Whitman left a very favorable impression on Dohrn is clear from Dohrn's letter supporting Whitman's application for a position at Columbia University. As Dohrn wrote, "The half year you worked in the Zoological Station has given me the highest opinion of what you will be able to accomplish in the right situation; and if my word can have the least influence with the authorities of the College, it will go thoroughly in your favor" (Dohrn, 25 June, 1885). Columbia did not, in fact, hire Whitman for that position but instead eventually chose Edmund Beecher Wilson for a similar job. And Wilson was the first man to work at the Naples Station officially, that is at a properly subscribed table (Osborn, 1895; Groeben, 1984).

At first Wilson encountered difficulties in receiving acceptance to work at the Station. He had expected to work at one of the English tables but found them full when he arrived in Naples in March 1883. Also he learned that "it is considered unfair to admit men to the station unless regularly provided for by a subscription from their own country." Even the prospect of a subscription would allow Dohrn to admit Wilson, but acting otherwise would be unfair to those of other countries whom Dohrn had had to turn away. Naturally, Wilson felt keenly disappointed, for he believed that "the station has now become practically the headquarters from which most of the leading European laboratories derive their best methods, and where, indeed, much of their most telling work is done." Naples remained a "tempting treasure" to be anticipated (Wilson, 9 March 1883). Fortunately, by April Wilson was in place at a table subscribed by Williams College in an arrangement made by Wilson's cousin Samuel Clarke, who went to Naples the next year while Wilson taught at Williams for him (Morgan, 1940, p. 126; 1941, pp. 319-320; 1942, p. 240).

In the meantime President Gilman of Hopkins had offered to take a table for Wilson, and Wilson, "as a good Hopkins man," regretted that Hopkins had not been the first American institution to do so. In part hoping to elicit Gilman's further support, Wilson enthused about the opportunities at Naples:

It is in every respect the best laboratory I have seen and my high expectations have been fully met.

Two things especially strike me as characteristic of this laboratory. The first is the perfection of the technical methods of research. It is now almost proverbial for zoologists to say: "For methods go to Naples" and in the same breath is usually added "A good method is half the battle." Certain it is that many of the best modes of work now used at Leipsic, Cambridge and elsewhere have originated here. The secret of this is simply that fifteen or twenty zoologists are usually at work, who come from laboratories in all parts of the world and bring

their experience to a focus here. They are all experimenting and comparing results and new methods can thus be very thoroughly tested . . . [Wilson, 13 April 1883].

Wilson expected to stay awhile, possibly as long as a year in Naples, though he was not sure that he could afford such a lengthy visit. Yet Dohrn reportedly soon invited Wilson to stay for three years and to publish a lengthy study of the local *Renilla* which would complement Wilson's study of American *Renilla* (Brooks, 15 July 1882). Wilson loved the Station, the colorful setting, and especially the music which played an important part in his life. For family and career reasons, he nonetheless reluctantly declined Dohrn's offer and returned to the United States. As he said later, Naples had made "a deep and lasting impression" on him (Morgan, 1941, pp. 319-320). In discussing future plans for the Marine Biological Laboratory in later years, it is clear that Wilson retained fond admiration for the Naples Station and in some respects wished to make the MBL more like Naples (Lillie Papers).

A decade later, in the 1890's, Wilson returned for a second visit, along with an increasing number of other Americans. Undoubtedly the enthusiasm expressed by Whitman and Wilson during the summers at the MBL, as well as the exciting new work issuing from the Station stimulated a number of American biologists, including George Howard Parker, William Morton Wheeler, Thomas Hunt Morgan, and eventually Edwin Grant Conklin, to visit Naples themselves. The Naples experience influenced each of these men, as each directly responded to the dominant questions and research of Naples in his own work. Each of these men recorded the impressions which the Naples experience left on him.

Parker arrived first, in the spring of 1893. He had spent three summers in Woods Hole at the U. S. Fish Commission and the MBL, and then had gone to Europe to study the origins of the nervous system. He resolved to spend a half year each in Leipzig, Berlin, and Freiburg, then to go on to Naples, for as he said, "Every young zoologist of my generation was desirous, as part of his early training, to work at the Naples Zoological Station" (Parker, 1946, pp. 136, 82-83, 91). Though he did not say much about his scientific work at Naples, it seems clear that the opportunity to work with a variety of different organisms and to discuss results with a diverse group of researchers helped him to some of his generalizations about nervous structure and function. In leaving he concluded that "of all places to spend the opening half of the year Naples stood at the forefront" (Parker, 1946, p. 107).

Wheeler arrived in Naples at the turn of the new year, after a stay with Theodore Boveri in Würzburg. In a postcard to a friend at Chicago, Wheeler wrote:

Have at last reached the "Mecca" and hope to go to work tomorrow, when my place in the lab will be ready for me. Naples is even more beautiful than I had imagined it to be. There is plenty of foliage on the trees and the weather is heavenly compared with what you are probably having in Chicago . . . Regards to the boys and to Professor Whitman [Evans and Evans, 1970, p. 89].

Yet Wheeler found the poverty and Neapolitan lifestyle appalling, even while he found the scenery so attractive. Though later known for his outstanding work on ants, Wheeler spent his time at Naples on developmental studies of various invertebrates, including the *Myzostoma*, which he found begin as small young males and mature into females. Clearly stimulated by the dominant concerns with development at the MBL and at the University of Chicago under Whitman, Wheeler's early researches followed the pattern of many of the young American biologists. His firm grounding in the methods and problems of cytology and developmental morphology provided the foundation for later work (Evans and

Evans, 1970, pp. 89–98). And he pursued that grounding during three and a half months of embryological study at Naples. Presumably it was at Naples that Wheeler became interested in the debates about development stimulated by the half embryo experiments of Roux and Driesch. Yet though he went on to translate Roux's manifesto for *Entwicklungsmechanik* for an evening lecture at the MBL, Wheeler always maintained a traditional morphological focus on the whole organism. He resisted the rush exemplified by *Entwicklungsmechanik* to cut up organisms and to manipulate them with experimentation. Leaving Europe in July to return to Chicago, Wheeler met Morgan, who was then on his way to Naples (Wheeler, 1895; Evans and Evans, 1970, pp. 104, 234–235).

Morgan clearly received a particularly strong stimulus to his work at Naples. Biographers have emphasized the contact there with Hans Driesch and Driesch's impact on Morgan (Allen, 1978). Clearly Morgan did respond to the debates in progress among Driesch, Roux, and others convened at Naples—debates about the extent to which an embryo experiences any preformation or predetermination because of its inheritance or early structure. Of the stimulating setting, Morgan wrote that "No one can fail to be impressed and to learn much in the clash of thought and criticism that must be present where such diverse elements come together" (Morgan, 1896). In fact Morgan's early work generally followed closely the interests of those around him or responded to problems which seemed particularly exciting at the time, so the stimulus at the MBL, then Naples directed him (Brooks, 21 June 1891). The years just prior to his Naples visit reveal his existing interest in the experimental work of Pflüger, Born, Roux, Chabry, Driesch, and Hertwig on early development: whether the concrescence theory works for teleosts and frogs and whether the echinoderm egg is isotropic dominated Morgan's work, with general questions about whether preformation or epigenesis best characterizes development. Much of Morgan's work began with a review and often the repetition of other results, then moved to Morgan's own related experiments. At Naples, where Morgan became friends with Driesch, his attention turned very directly to Driesch's work on fragmentation and partial embryos and their impact on interpretations of development. In the heated debate about preformation and epigenesis, about Weismann's and Roux's mosaic or Driesch's regulative views of development, Morgan himself maintained a moderate position, sympathetic to Driesch but closer to Whitman's emphasis on "organic continuity" to explain development (Sturtevant, 1959; Allen, 1978, pp. 55–60, 78–84).

Edwin Grant Conklin similarly rejected the developmental interpretations of Driesch or Weismann and Roux. His detailed cell lineage work on ascidian development led him to conclude that cleavage in some forms is determinate, in others indeterminate with respect to later development. This conclusion led him into direct disagreement with Driesch, who maintained that cleavage remains indeterminate. Yet when Driesch traveled to the United States he visited Conklin in Princeton and established friendly relations. It was not until 1910, when he attended a conference at Graz that Conklin visited Naples and followed up some of his disagreements with Driesch. Specifically, he examined at Naples the same organism that Driesch had studied there (*Phallusia mamillata*) and established that that form develops determinately as does *Cynthia* or *Amphioxus*, which Conklin had studied in detail earlier (Butler, 1952; Harvey, 1958, p. 65). He did not change his mind or his research program because of his work at Naples; rather his studies allowed him to discredit Driesch's alternative interpretations. And Conklin acquired further material to support his conclusion about the central role of cytoplasmic factors in development.

After the 1890's the American situation had substantially improved, and yet Americans still visited Naples. The MBL and the *Journal of Morphology* provided a laboratory and a publication outlet for Americans. And successful graduate programs provided places to pursue degrees. Yet the Americans went to Naples to learn theories and methods, to experience the special international exchange of ideas that took place at that "Mecca," and to examine organisms native to the area. The MBL did not replace the Naples experience for Americans and was not intended to do so, but complemented it. Positive first impressions stimulated a long tradition of American expeditions to the Naples Station.

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## LITERATURE CITED

- ALLEN, GARLAND. 1978. *Thomas Hunt Morgan*. Princeton University Press, Princeton.
- BROOKS, WILLIAM KEITH, to President Gilman, letters, Gilman Papers, Johns Hopkins University Manuscripts.
- BUTLER, ELMER GRIMSHAW. 1952. Edwin Grant Conklin (1863-1952). *Am. Phil. Soc. Yearbook* 1952: 5-12.
- DOHRN, ANTON, to Whitman, letter, Agassiz Collection, Museum of Comparative Zoology Archives, Harvard University.
- EVANS, MARY ALICE, AND HOWARD ENSIGN EVANS. 1970. *William Morton Wheeler*. Harvard University Press, Cambridge.
- GROEBEN, CHRISTIANE. 1984. List of Americans who visited Naples. Naples and MBL Archives.
- HARVEY, E. NEWTON. 1958. Edwin Grant Conklin. *Nat. Acad. Sci. Biog. Mem.* 31: 54-91.
- LILLIE, FRANK RATTRAY. 1911. Charles Otis Whitman. *J. Morphol.* 22: xv-Lxxvii. Lillie Papers, MBL Archives.
- MORGAN, THOMAS HUNT. 1896. Impressions of the Naples Zoological Station. *Science* 3: 16-18.
- MORGAN, THOMAS HUNT. 1940. Edmund Beecher Wilson. *Obit. Notice Fellows of R. Soc.* 3: 123-138 (p. 126).
- MORGAN, THOMAS HUNT. 1941. Edmund Beecher Wilson. *Natl. Acad. Sci. Biog. Mem.* 21: 315-342.
- MORGAN, THOMAS HUNT. 1942. Edmund Beecher Wilson. *Science* 96: 239-242.
- MORSE, EDWARD S. 1912. Charles Otis Whitman 1842-1910. *Natl. Acad. Sci. Biog. Mem.* 7: 269-288.
- NUNN, EMILY. 1883. The Naples Zoological Station. *Science* 1: 479-481, 507-510.
- OSBORN, HENRY FAIRFIELD. 1895. American students at the Naples Zoological Station. *Science* 1: 238-239.
- PARKER, GEORGE HOWARD. 1946. *The World Expands*. Harvard University Press, Cambridge.
- STURTEVANT, A. H. 1959. Thomas Hunt Morgan. *Natl. Acad. Sci. Biog. Mem.* 33: 283-299.
- WHEELER, WILLIAM MORTON. 1895. The problems, methods and scope of developmental mechanics. *Biological Lectures* 1894: 149-189.
- WHITMAN, CHARLES OTIS. 1882. Methods of microscopical research in the Zoological Station in Naples. *Am. Nat.* 16: 697-706, 722-785.
- WHITMAN, CHARLES OTIS. 1883. The advantages of study of the Naples Zoological Station. *Science* 2: 93-97.
- WHITMAN, CHARLES OTIS. 1892. Letter, Whitman Papers, University of Chicago Archives.
- WILSON, EDMUND BEECHER. Student file, Johns Hopkins University Archives.