

## **British Use and Support of the Naples Zoological Station Prior to the First World War**

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**Prior to World War I the Zoological Station at Naples was a German institution on Italian soil. However it was used by scientists of many nationalities and their governments and institutions helped to support it. They nonetheless engaged in rather different activities while there. There has been little effort thus far to characterize the British (mostly English, but some Scots and Irish) as a group. Germans occupied the largest number of Tables (31%). Italy came next, with 25%, followed by Russia with 9% and then Great Britain with 7%.**

**The British scientists were supported by Tables from the British Association for the Advancement of Science and the universities of Cambridge and Oxford. Anton Dohrn, who founded the Station, had a strong supporter in Edwin Ray Lankester, who shared his evolutionary interests. Lankester encouraged his students to work at the Station and his student Edwin S. Goodrich did likewise. The result was an important tradition influenced by Dohrn's principle of the succession of functions.**

**German and Italian scientists were much interested in exploring the local fauna, and contributed to the Station's monograph series. Only one Englishman, Geoffrey Watkins Smith, produced a volume in the series. British scientists were interested in producing taxonomic monographs, but they were more interested in exploring their local faunas and undertaking more global investigations. Therefore they studied the Mediterranean fauna because it contained organisms that were not so easy to obtain or study elsewhere.**

Founded by Anton Dohrn in 1872, the Naples Zoological Station has been the focus for quite a variety of historical studies. There are biographies and biographical essays of interesting persons, including of course Dohrn himself (Heuss 1991 and earlier editions; Kühn 1950). There have been studies dealing with the economics (in a broader as well as a narrower sense) of the Station (Parsch 1980; De Masi 1998; Ghiselin and Groeben 2000). Its famous frescoes by Hans von Marées have been the subject of much study and commentary (Groeben 1995; Santini and Groeben 2005). Other publications have focused on the development of various scientific disciplines at the Station (Ghiretti 1985; Monroy and Groeben 1985; Müller 1996).

Several publications have focused upon the various nations that have contributed to the life of the station. Some interesting patterns are suggested by these and the present essay is intended to add a bit to that line of research. We may begin by mentioning some of the publications that have such a focus. There are papers on female Americans (Zottoli and Seyfarth 1994; Sloan 1978), on Americans in general (Maienschein 1985), on the Dutch (Linskens 1975), on the Japanese (Mizoguchi 1998) and on the Russians (Orlov 2001; Ghiselin 2002). An entire book has been devoted to the Japanese (Nakano, Mizoguchi, and Yokota 1999), and one on the Russians (Fokin 2006) will soon appear in an English version. The Italians were largely neglected until quite

recently (Groeben and Ghiselin 2001). Lack of work on the French is easily explained (Fischer 1980). The French developed their own system of laboratories. As to the British, including the Scotch, Irish and Welsh, as well as other denizens of the Empire, there have been publications on some important personages, but nothing on them as a group. The present essay is not an effort to survey the British scientists who worked at the Station. Rather it is an effort to characterize the British presence there and to compare it with that of various other nationalities. As with most of my earlier work on the Station, the focus is on the period up to World War I, when there was a major hiatus.

The privilege of working at the Station was largely contingent upon grants from governments, universities and learned societies that funded so-called “Tables”—places in the laboratory together with the amenities that accompanied them. According to Groeben and Ghiselin (2001) 30% of Table holders from 1873 to 1915 were from Germany, 25% from Italy, 9% from Russia, 7% from Great Britain, 6% from Austria, 6% from the United States, 4% each from Switzerland, 4% from the Netherlands, 3% from Belgium, 2% from Spain, 1% from Hungary, 1% from Romania, and there were an additional, miscellaneous, 2%.

We should note at the outset that the English were highly supportive of the Station. Darwin in particular was very enthusiastic and supportive of Dohrn’s efforts. Dohrn had visited him at Down House on September 26, 1870. They shared an interest in the evolution of crustaceans (Groeben 1982). Darwin sent copies of his publications. He contributed £120 in 1874, and in 1879, after receiving the Bressa Prize of the Royal Academy of Sciences of Torino, donated another £100. Dohrn proposed that the money be used to assist English scientists in working at the Station. Darwin also used his influence on other English scientists. The British Association for the Advancement of Science funded a Table at the Station and so did Cambridge and Oxford. That gave three Tables, so that for a time the number of British and American investigators at the Station was about equal. George Parker Bidder, an expert on sponges, was a classical English eccentric who is said to have worked at night and slept during the day (Sidney Smith, pers. comm.). He took care of his housing requirements in Naples by buying a hotel (renamed Parker’s Hotel) there. He made special arrangements with Dohrn so that he would have an “extraordinary” Table for his personal use. He worked there every year from 1887 to 1892 inclusive.

Dohrn worked closely with the British Association for the Advancement of Science to get support for his endeavors. From the outset there was a Committee that dealt with the Naples Station. The annual Reports of the Association provide an excellent source of information about the history of British involvement in both supporting and using the Station. The name and composition of the Committee naturally changed a bit over the approximately forty years of its existence, but its role remained more or less the same. The membership of the Committee is shown in Table I.

Dohrn, who attended several meetings of the Association, was for some time a member of the Committee, and was identified as both Secretary and author for the first Report. He wrote some of the material that went into the other Reports as well, and furnished data on the utilization of the station, its development, and the publications that had been produced. These English-language reports overlapped to a considerable extent with the ones in German that Dohrn published in the house organ of the Station.

The Committee had two main functions. One of these was to encourage the Association to support work at the Station, mainly by providing funds for its Table. The other was to evaluate the applications of scientists who wanted to utilize the Table. Dohrn had no control over who used the Tables, although he was able to accommodate a few scientists by making other arrangements. He did have some flexibility as to scheduling and deciding which Table an investigator might occupy. For that reason the same scientist might sometimes occupy the British Association Table and some-

TABLE 1. The Naples Marine Station Committee membership

The numbers in the table correspond to that of the annual meetings of the Association in which the Report was published. Reports were sometimes published during the year of the meeting, but usually it was in the following year. Therefore the numbers are more convenient than the years. The Secretary is indicated by the corresponding number being set in **bold** type.

G. Rolleston	43	49 50 51
P. L. Sclater	43 45 47 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66	
A. Dohm	<b>43</b>	
T. H. Huxley	43 45 47 49 50 51 52	
W. Thompson	43	49 50 51
E. R. Lankester	43 45 47 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68	
F. M. Balfour	45 47 49 50 51 52	
J. Gwyn Jeffreys	45	49 50 51
M. Foster	45 47 49	51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66
A. G. Dew-Smith	<b>45 47 49</b>	50 51
W. B. Carpenter	47 49 50 51	
P. Sladen	<b>50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68</b>	
G. J. Allman	51 52 53	
A. Newton	52 53	
A. Sedgwick	53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68	
A. M. Marshall	54 55 56 57 58 59 60 61 62 63 64	
A. C. Haddon	54 55 56 57 58	
H. N. Moseley	55 56 57 58	
J. Cossar Ewert	59 60 61 62 63 64 65 66 67	
S. J. Hickson	65 66 67 68	
W. C. M'Intosh	66	
W. A. Herdman	67 68	
W. F. R. Weldon	67 68	
W. E. Hoyle	67 68	
G. Rolleston		
P. L. Sclater		
A. Dohm		
T. H. Huxley		
W. Thompson		
E. R. Lankester	69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86	
F. M. Balfour		
J. Gwyn Jeffreys		
M. Foster		
A. G. Dew-Smith		
W. B. Carpenter		
P. Sladen		
G. J. Allman		
A. Newton		
A. Sedgwick	69 70 71 72 73 74 75 76 77 78 79 80 81 82	
A. M. Marshall		
A. C. Haddon		
H. N. Moseley		
J. Cossar Ewert		
S. J. Hickson	69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86	
W. C. M'Intosh	69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86	
W. A. Herdman	69 70 71 72	
W. F. R. Weldon	69 70 71 72 73 74 75 76	
W. E. Hoyle		
G. B. Howes	<b>69 70 71 72</b>	73 74 75
J. E. S. Moore	73 74	
T. R. R. Stebbing	<b>75 76 77 78 79 80</b>	
G. P. Bidder	75 76 77 78 79 80 81 82 83 84 85 86	
S. F. Harmer	79 80 81 82 83 84 85 86	
W. B. Hardy	80 81 82 83 84 85 86	
E. S. Goodrich	<b>81 82 83</b>	84 85 86
A. D. Waller	81 82 83 84 85 86	
J. H. Ashworth	<b>84 85 86</b>	
F. O. Bower	85 86	

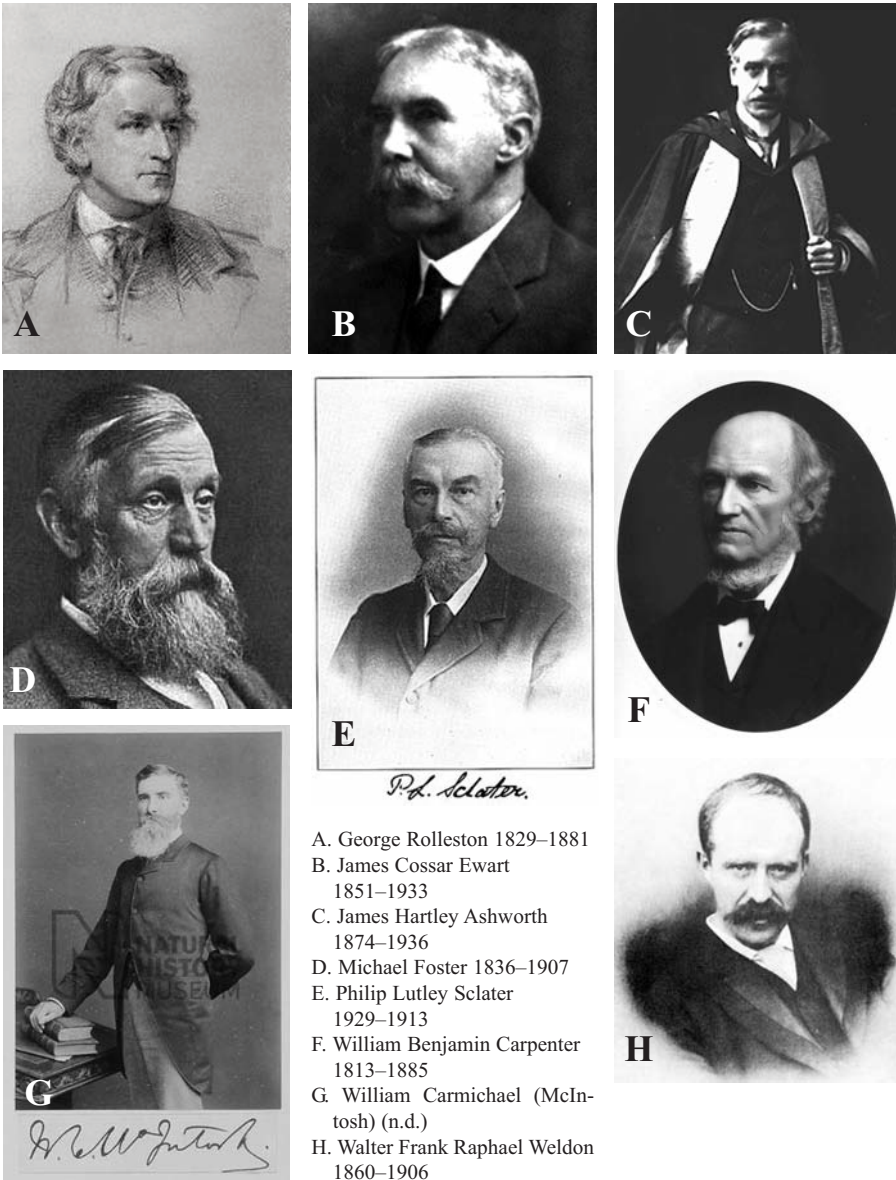
times one sponsored by Oxford or Cambridge. These functions of the Committee help to explain its makeup. In the first place there were influential and well known scientists whose prestige was an asset for the Committee. Many of the members were Fellows of the Royal Society of London. Some of them were very well known to the general public as well as the scientific community. Thomas Henry Huxley (1825–1895) was famous for his advocacy of evolutionary ideas and much else besides. Sir Wyville Thomson (1830–1882) was well known for his leadership in the Challenger Expedition. Many were university professors, and their prestige and that of their institutions must have been quite impressive. Secondly, the Committee largely consisted of persons with expertise in the areas of research that were expected to be carried out at the Station. Some of the younger members of the Committee seem to have been particularly interested in supporting the Station. Many of the Committee members utilized the Table themselves or else the Oxford and Cambridge Tables. They also had students who might make use of it.

The reports of the Committee were well designed to give an impression that the Station was in flourishing condition and benefited from the support that the Association was providing. They also were designed to show that the Association was getting its money's worth. The occupants of the Tables provided accounts of their visits. These included much praise for the institution and its staff as well as preliminary reports on their research. One suspects that the occupants hoped that their reports would provide grounds for return visits.

Indeed, unpublished correspondence in the archives of the Station makes it abundantly clear that the activities of the Committee and its members were carefully planned and orchestrated, and that a great deal of maneuvering went on behind the scene. The main players here were Dohrn himself, as one might expect, and the Secretary of the Committee. [Albert George] Dew-Smith (1848–1903) was a Cambridge physiologist and partner, with Horace Darwin, in the Cambridge Instrument Company. He was the third occupant of the Cambridge Table, from February, 1874 to June 10, 1874, at the same time that the Table was occupied by Francis Maitland Balfour, the second occupant. Dew-Smith also occupied the Cambridge Table from December 15, 1875 to February 12, 1876. He was Secretary from 1876 to 1878. (Walter) Percy Sladen (1849–1900) occupied that position from 1879 to 1898. Sladen was a gentleman scholar from Halifax, York, and a largely self-taught expert on echinoderms (Anonymous 1900). As an occupant of the British Association Table from December 3, 1878 to February 16, 1879 he made important observations on the pedicellariae of these organisms (Sladen 1880). Later he monographed the asteroids of the *Challenger* expedition. Sladen sent Dohrn and his staff requests for material for the Reports, drafts of Reports, and accounts of the negotiations in which he was involved.

There was a minor crisis with respect to funding when, at the Aberdeen meeting in 1885, the Association cut its support from £100 to half that amount. There seems to have been some sentiment among the membership of the Association that the Plymouth Laboratory diminished the need for support of the Naples Station. The Committee protested and pointed out that the Table was occupied only thanks to Dohrn's patient forbearance. Again, at the Leeds meeting in 1890 the Committee of Recommendations did not approve the usual sum. The situation was saved when one of the members of that Committee, a Captain Noble, offered to provide the £100 out of his own pocket. One stratagem that Sladen used was to announce the appointment of future Table occupants before the grant had been approved at the meeting. Obviously it would be embarrassing to the Association if it did not provide the grant.

It seems obvious that the Oxbridge Tables had a different kind of institutional support than that of the British Association, and therefore somewhat different problems getting funded. So far as Cambridge goes, at least, a great deal of light is cast upon the workings of the system through the correspondence between Harmer and Dohrn, during the period from May 24, 1889 to October 12,



Images courtesy of the Historical Archives of the Stazione Zoologica Anton Dohrn (Naples Zoological Station)

1910, when the former was doing most of the administrative work. A major goal of the correspondence was to inform Dohrn of who had been nominated, and to get Dohrn's approval, especially when extraordinary arrangements were made, such as allowing two persons to occupy the Table at the same time. Incidentally, Harmer provided a substantial amount of information about the nominees' qualifications and intended research. The decision as to whom to nominate was made by a committee called the "Special Board."

Another important topic for the correspondence was to arrange for the University to provide

an annual grant of £100, supplemented by another £50 in support of the Table occupants themselves. The grant had to be renewed every five years, with the approval of the Senate of the University. There was always some opposition, as is clear from a letter from Bidder to Dohrn, dated April 6, 1893, from Parker's Hotel in Naples. Bidder was sending Oscar Brown, Fellow of Kings College and a lecturer on history, to meet Dohrn. Brown wanted the money spent not on the Station, but on history. Bidder remarked "He is by no means a fool." Brown was fond of Goethe and considered modern scientific men devoid of culture. Dohrn, who was as fond of Goethe as anybody, was anything but devoid of culture, and Bidder obviously had that in mind.

The extent to which the Table was used and the performance of those who occupied it were important considerations in the deliberations as to whether to renew the grant. There seems to have been little difficulty in getting the grant renewed in 1891, 1896, or 1901, but around that time Harmer seems to have become a bit pessimistic. In a letter to Dohrn, dated March 8, 1901, Harmer expresses considerable dissatisfaction with the performance of the men who had been sent over during the previous five years. Dohrn was evidently quite concerned, for in a long letter to Harmer, dated April 18, 1901, he provided a detailed enumeration of the Table occupants and their performance. Stead, for example, had worked on annelids, but published nothing and become a school teacher. On the other hand, Punnet's work on elasmobranch nerves had been published in the Proceedings of the Royal Society of London. Harmer responded in a letter to Dohrn, dated April 24, 1901, apologizing for giving the impression that the fault lay with the Station; he was only concerned about justification of the grant. He observed that quite a number of talented young men had been able to obtain grants for travel to the tropics and elsewhere. And he remarked that students able to assimilate the work of others were often at a loss when they had to do research on their own. He said that the opponents of the grant had complained about the Table being used only for zoologists, and wondered what could be done to get physiologists and botanists involved.

Five years later, Harmer was downright pessimistic. In a long letter to Dohrn, dated June 6, 1905, he expressed disappointment with the last five years. There were not enough applicants to fill the places. One reason was that people like J. S. Gardiner had been able to arrange for their own expeditions. But the more likely cause was "the great interest which has been taken here in Mendel's work." It must have come as a great relief to both of them when the University Senate did renew the grant. On October 12, 1910, the year after Anton Dohrn's death Harmer wrote to his son Reinhard Dohrn, saying that he could not help much because he would not be at meetings where he would have influence, but that he would write the Professor of Zoology, J. Stanley Gardiner. Again he explained that the dropoff had been mainly due to the influence of Mendel's work. Bateson had been trying to redirect everything to genetics. The same problems seem to have afflicted Oxford. E.S. Goodrich, in a letter to Reinhard Dohrn dated December 1, 1913 remarked: "So many young zoologists have been diverted to Mendelism & other special studies that it is quite difficult to find a sufficient number to fill the various Tables at seaside laboratories." And in spite of Harmer's efforts no Cambridge physiologists or botanists ever got interested. Nonetheless the grant was renewed, and the Cambridge, Oxford and British Association Tables continued to be used until the beginning of the war.

In some ways the most important English participant in the early days of the Station was Edwin Ray Lankester (1847–1929), who became a friend of Dohrn when both were studying under Ernst Haeckel at Jena (see Lester and Bowler 1995; Ghiselin 1996). While the station was getting started Lankester spent the winter of 1871 to 1872 with Dohrn in Naples. He published a paper based on miscellaneous observations made at that time mainly having to do with evolution and development (Lankester 1873). Later he sent his students to work at the Station. The two evolutionary comparative anatomists formed a sort of alliance, one that is most evident in the publica-

tions that they edited. In the first place there was the Station's house organ, *Mitteilungen aus der Zoologischen Station zu Neapel*. There was also a monograph series entitled *Fauna und Flora des Golfes von Neapel*. The monograph series was intended to help support the activities of the Station, with the sale of one monograph subsidizing the sale of the next. Lankester took over the editorship of the important periodical the *Quarterly Journal of Microscopical Science*, which had been edited by his father. Work done at Naples by Lankester's students and other English zoologists provided a substantial amount of the contents of the journal, and that tradition continued when Lankester's student Edwin S. Goodrich took over as editor (G.C. Bourne 1919). Lankester was for some time a professor at Oxford as was Goodrich later on. Lankester and his students were largely responsible for the content of the *Oxford Natural History*, an important reference work. There was a rival *Cambridge Natural History*. Oxford was more enthusiastic about Darwinism than Cambridge was.

The monograph series was an important activity of the Zoological Station and many of the people who worked there were monographers. The taxonomic monograph is a kind of literary genre, and it may help to explain what a monograph is supposed to accomplish. Charles Darwin's *A Monograph on the Sub-Class Cirripedia, with Figures of all the Species*, is a particularly good example (Darwin 1851–1855). So is Dohrn's own monograph on the Pantopoda or Pycnogonida (Dohrn, 1881). Such works typically begin with a summary of what is known about the group of interest, then provide a description of the relevant anatomy, species descriptions, a revised classification, and generally some discussion of the broader implications of the research.

It is interesting that only one of the monographs was written by an Englishman, Geoffrey Watkins Smith (Anonymous 1914). This was a monograph on the Rhizocephala, a group of parasitic animals rather obscurely related to the barnacles to which Darwin devoted some eight years of research (Smith 1906). As part of his research for the monograph Smith visited various museums in order to examine specimens. Letters to Dohrn, dated September 4 and 14, 1905 indicate that Dohrn acceded to Smith's request for financial support for a visit to the museum in Copenhagen. Work on the monograph was not simply a matter of exploring the fauna, however. It was background to further research that he did on crustacean sexuality (Smith 1910a, 1910b, 1911, 1913).

Smith was born at Beckenham, Kent on October 9, 1881. As a student at Oxford, he worked under W.F.R. Weldon, who in turn had been a student of Lankester and Balfour, and succeeded Lankester as professor at University College in 1890 before moving to Oxford in 1900. Smith and Weldon co-authored the chapter on Crustacea in the *Cambridge Natural History* (Smith and Weldon 1909). However, it was a posthumous arrangement made after Weldon's untimely death on April 13, 1906). Weldon's early work on crustacean morphology led him into studies of variation in natural populations and he made important contributions to the study of evolutionary mechanisms (he was a biometrician rather than a Mendelian). Smith, after working at Naples from 1903 to 1905, returned to Oxford, where he succeeded G.C. Bourne. As already mentioned, he continued to work at Naples. He was there from March 27 through April 6, 1914. An officer in the British army, he died in France on July 10, 1914.

There were no American monographers at all. Does this have something to do with the English language or Anglo-Saxon culture? Probably not; the low representation is much easier explained in terms of the distance from Naples and the kinds of scientific projects that were feasible. If one is going to prepare a thorough treatment of a faunal or floral element of the Gulf of Naples, it really helps to have access to the organisms over a protracted period of time. Systematists can work largely with preserved materials in museums with perhaps occasional trips to the shore to observe the living ones. But if the organisms are to be collected extensively or studied much in the living state, it is much better to reside where they occur for substantial periods of time.

Smith (1906) remarked that he spent three years at the Station. It was natural, therefore, for Dohrn and his assistants to produce monographs. That helps to account for the relatively large number of Germans among the monographers, but just a little. Their access to reliable support for Tables was probably more important. By the same token, it was convenient for Italian scientists, especially those who resided in Naples and who occupied Tables, to undertake that kind of research. One Italian, Battista Grassi, seems to be an exception in that he spent very little time at the Station. However, the animals that he monographed, the Chaetognatha, are almost all pelagic and therefore widely distributed, so that although they occur at Naples there is no local fauna that needed special attention. He did most of his work at Messina. Likewise, the Russian Uljanin, who worked on *Doliolum*, a pelagic tunicate, worked largely at Villefranche-sur-Mer, where the Russians had their own establishment.

At any rate, of the approximately 33 monographs published before the First World War, 7 (about 20%) were written by Italian and 24 (about 70%) by German-speaking scientists. This disparity is considerably diminished when one compensates for the larger number of scientists. The Germans, Austrians and others who wrote in that language were numerous enough that the figure is not disproportionate. However, the Italians, with 25 percent of the Tables, produced 20% of the monographs, and the British with 7% of the Tables produced about 3% of the monographs. Granted that a sample size of one is not very significant, the Italians were nonetheless considerably more prolific of monographs than the English were. Some of the English scientists who worked at the Station at the time did the kind of systematic research that goes into monographs. One of these was Arthur William Waters, about whom I know very little, except that he was from Manchester and occupied the British Association Table at the Station from November 13 to December 30, 1875 and from October 13 to December 1, 1879. He published a monograph on the Bryozoa of the Gulf of Naples as three short papers in the *Annals and Magazine of Natural History* (Waters 1899).

A more important systematist who spent time at the Station was William Abbott Herdman (1858–1924), who was Derby Professor of Natural History in the University of Liverpool from 1881 to 1919. He was a member and Chairman of the British Association's Committee and occupied its Table from March 19 to April 9, 1900. He gives a good account of his visit (Herdman 1900). Herdman was an important student of tunicate systematics and phylogeny. Liverpool had its own marine laboratory and its own series of publications, to which he was a major contributor. Work at Liverpool was largely focused on the local biota and in that sense its laboratory did not compete much with the one at Naples. Much the same may be said of the Plymouth laboratory on England's southern coast. The situation with the English was in that respect not much different from that of the Americans. Furthermore, the English were also much involved in the work of the *Challenger* Expedition, which explored the deep sea from December 21, 1872 to May 24, 1876. Herdman worked as an assistant to Charles Wyville Thomson in efforts to get the extensive collections from that expedition worked up by specialists and published. The Zoological Station was only marginally involved in marine exploration beyond its own faunal province. It did participate in training Italian naval officers to collect materials. It also attempted to establish a laboratory at Ralun in New Britain, but withdrew because it was not a feasible project (Groeben 2004).

Some other systematists fit the pattern of Herdman. Their geographical interests lay elsewhere and they went to Naples to get comparative material. H.M. Kyle worked on the classification of flatfishes, and took advantage of a visit to the Station to study a species that he considered a transitional form (Kyle 1900). Anna Vickers (1852–1906) was working on a monograph of Barbados algae. She was at the Station from April 3 to May 26, 1897, from October 13, 1899 to January 1, 1900, from January 8 to April 18, 1902, and from December 24, 1903 to April 15, 1904. In 1902, she was able to study living material as well as specimens that she brought with her (Vickers 1903).



Much of the research that English zoologists did at the Station had to do with phylogenetics and classification at the higher taxonomic levels. Furthermore there was an intellectual tradition, one might even say a school, that can be traced back to the early interaction between Dohrn and Lankester. It also involved Francis Maitland Balfour (1851–1881), who did his classical research on the development of elasmobranchs, a group that interested Dohrn very much, during a period of two years beginning around the time that the Station opened. Dohrn's approach to phylogenetics involved his principle of the succession of functions, which involved a search for physiological continuity (Dohrn 1875; for translation and commentary see Ghiselin 1994). He hypothesized that the vertebrates are descended from annelids. This idea was heretical at the time, but it was nonetheless taken seriously. That particular relationship aside, the same general approach could be used to study the evolution of various structures. One group of structures was the secondary body cavity, or coelom. Lankester was very much interested in this topic and so was his student already mentioned, Edwin S. Goodrich (1868–1946), who succeeded him as Linacre Professor of Comparative Anatomy at Oxford and also took over as Editor of the *Quarterly Journal of Microscopical Science* and served in that post for many years. Goodrich himself visited the Station repeatedly. He published a paper on the coelom in 1895 and a much longer one in 1945 (Goodrich 1895, 1945). His many, but rather brief, visits in the interim provided much documentation.

Lankester's and Goodrich's students, as well as students of other English zoologists, went to Naples to work on projects that to some extent form part of this tradition. Much of their work was published in the *Quarterly Journal of Microscopical Science*. One of Lankester's students, J.T. Cunningham (1883) worked on the embryology of the gastropod *Patella* (see also Cunningham, 1883). John Dow Fisher Gilchrist (1866–1926) was interested in the pallial organs of opisthobranch gastropods (see Gilchrist 1894). After completing his undergraduate work at Edinburgh, Gilchrist became a student of Arnold Lang (1855–1914) in Zürich (Amodio 1977). Lang had been one of Dohrn's assistants from 1878 to 1885, before receiving the call to Jena as the first Ritter professor of phylogenetics. He remained at Jena until 1889, when he accepted the call to Zürich. Gilchrist received his doctorate under Lang and became a professor of zoology at Capetown. Alfred Gibbs Bourne was a student of Lankester who worked on annelids. (Alfred Gibbs Bourne, who accepted an academic post in Madras, India in 1885, should not be confused with Gilbert C. Bourne, another of Lankester's students, who worked on Porifera, Cnidaria and Mollusks.) During his first visit, from January 3 to April 14, 1882, he made miscellaneous observations at that time and also checked Lankester's observations on squid development, which had been criticized by M. Ussow (A.G. Bourne 1883). His second visit, from November 1, 1883 to April 14, 1884 seems to have been more productive of results on annelids than the former (A.G. Bourne 1885). In this case he made some observations for Lankester having to do with the circulatory systems of mollusks.

Quite a number of English scientists who were interested in phylogenetic topics went to Naples to find material that was more readily available there than elsewhere. These include John Beard (1884) on the Myzostomida, Harmer (1891) on bryozoans, MacBride (1892) on various echinoderms, and Minchin (1892) on sponges. Arthur Willey (1867–1942) made a career of traveling to remote places seeking out animals that were considered primitive (Kerr 1944). A student of Lankester, he occupied Tables at the Station from July 14 to August 2, 1889 and from October 8, 1891 to August 27, 1892. While there he did important research on "lower" chordates. He later set out on an expedition to more remote areas seeking animals that do not occur at Naples, especially the pearly *Nautilus*. He was welcomed at the Station on the way, but did not see Dohrn at that time.

The notion that comparative anatomy and embryology from an evolutionary point of view ceased to be studied at the turn of the century is an academic myth. It is true, however, that other

topics became more fashionable and that there was a great expansion of experimental and physiological research. The picture at Naples is complicated by the fact that the original laboratory facility was constructed primarily for morphological and systematic research. A physiological laboratory was opened in 1888, approximately doubling the amount of space available at the Station.

Goodrich's student, Julian S. Huxley (1887–1975), occupied a Table from October 21, 1909 through July 15, 1910. In a letter to Dohrn dated 22 November 1906, Geoffrey Watkins Smith, whom we have discussed previously, mentioned the young Huxley's approaching arrival at Oxford, though he had not met him yet. Smith's former tutor, G.C. Bourne, had been appointed to the professorship formerly occupied by Weldon. Smith now replaced Bourne as tutor, and Smith became Huxley's tutor. We may remember that Smith died in 1914. Huxley became his replacement in 1919.

Huxley, as is generally known, ultimately became one of the architects of the Synthetic Theory. One naturally wonders whether, or to what extent, Goodrich was responsible for that. The question is of some interest because of my rather unpopular thesis that morphology contributed little or nothing to that version of Darwinism (Ghiselin 1980, 2006). One argument against my view has been that Goodrich contributed to the Synthesis because he was the teacher of the younger Huxley. But Huxley's research, at the Zoological Station and elsewhere, was at most an outgrowth of the morphological tradition, not a contribution to what might be called evolutionary morphology. In his autobiography Huxley (1970) says that one of the Assistants, Paul Mayer, suggested that he work on regeneration during his period at Naples. He did, and the work was quite successful, though it is a far cry from the kind of comparative anatomy and embryology that interested Darwin, Dohrn, Lankester and Goodrich. On the other hand, maybe there was some influence from Smith, whom Huxley characterizes as "brilliant." That would provide a link, via Weldon, with the kind of evolutionary biology that really did get assimilated in the Synthesis.

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