

DOI: 10.6093/2532-2699/12495

## Architettura, metropoli e vita marina: note su un imbroglio collaborativo

### Keywords

Bay of Naples, Marine Station, Financing, Metropolitan Life, Aquarium

### Abstract

This paper explores the relationship between architecture, science, and metropolitan life through the lens of Anton Dohrn's zoological station in Naples. Founded in 1872, the station emerged not in isolation, but amid the complexities of a densely populated metropolitan environment, challenging traditional notions of biological field stations. Drawing on a wide array of literary, visual, and archival sources, the paper demonstrates that unlike the many other marine stations which were sited chiefly for their surrounding zoological wealth, Dohrn's station was positioned at the Bay of Naples principally due to, if not entirely dictated by, its proximity to a bustling former capital city of half a million, by far Italy's most populous. Which is to say that the metropolitan center, while typically eschewed by field biologists of the time who sought to break with the silent confines of the cabinet, became at Naples marine research's bedrock.

The study examines how the collaborative dynamics of human and nonhuman actors shaped the architecture and functionality of Dohrn's institute, transforming the original architectural idea of a humble cabin into a monumental palace housing one of the most prestigious biological research centers in Europe. While the initial intent was merely to accommodate his seaside water tanks at the Strait of Messina, the relocation to Naples brought about a whole set of entirely alien attributes including the public aquarium program, the spectacularization of living animals, and the monumentality of the architecture. They transformed what was intended as an oceanfront cottage into a veritable urban artifact. All of these non-scientific attributes were adventitious, in the sense that they were both incidental and foreign to the motivation of field research, as much as the zoological station itself was a foreigner's serendipitous expansion to the human engineering of the Neapolitan coastline. Yet it was precisely these secondary factors that proved essential in enabling research in the first place. In short, Dohrn begot his station at the expense of venturing into a paradoxical situation: to study nature within a whirlpool of artifacts, among which was the station itself.

### Biography

An Tairan is an architectural historian of the long nineteenth century whose work investigates the material processes, environmental impacts, and epistemological ramifications of human research activities. He received a PhD in History and Theory of Architecture at Princeton University (2024), where he is currently a Postgraduate Research Associate. His dissertation examines how observatories, field stations, and expedition outposts – often conceived as neutral sites of inquiry – unwittingly became instruments of power in mid-to-late nineteenth-century Italy. He holds a bachelor's degree in Urban Planning from Peking University and an MDes in History and Philosophy of Design with distinction from Harvard GSD.

An Tairan

Princeton University

# Architecture, the Metropolis, and Marine Life: Notes on a Collaborative Imbroglia

## Introduction

The present paper explores how scientific knowledge becomes spatially and institutionally embedded – how the architecture of science emerges not solely through deliberate design, but from historically contingent processes of (co)labor that draw in nonhuman actors, economic demands, and environmental constraints. The Naples aquarium captures this dynamic, presenting an unusual case where scientific work, public spectacle, and real estate speculation coalesced into architectural form. Founded in the aftermath of the Risorgimento as the home of Anton Dohrn's Zoological Station, the aquarium held a dual identity as a major marine research laboratory and a popular attraction for a growing urban public. The study approaches Dohrn's aquarium as a web of evolving relations, linking scientific inquiry to finance, biological display to urban development, and humans to the marine life they enclosed. Shifting the focus from the individual architect to a wider cast of patrons, practitioners, and nonhuman participants, it reveals how the aquarium's spatial and operational logic arose from intertwined pressures of personal aspiration, infrastructural necessity, institutional survival, and epistemic performance. In doing so, it draws architectural history into dialogue with the histories of science, urbanism, and the environment, anchoring this well-known edifice within a broader narrative of knowledge production.

Existing scholarship on the Naples aquarium has cast it alternately as a landmark of scientific innovation and a singularly sited work of architecture<sup>1</sup>. While historians of science have emphasized the Zoological Station's formative role in the rise of marine biology, attending to its experimental and logistical agendas, architectural historians, for their part, have studied the building as the material unfolding of the visionary spirit that animated its founder, attuned to the particular circumstances that have marked its architectural character and construction processes. Both fields engage the aquarium's urban site – its strikingly atypical location within a dense metropolis, in contrast to the many so-called biological field stations of the late nineteenth century chiefly sited in extramural, “natural” environments – yet often treat it as merely contextual. In these accounts, Naples figures either as an undesirable social milieu that ultimately frustrated the station's initial ambitions to study marine life *in situ*<sup>2</sup>, or as a neutral ground upon which an intellectual as well as architectural authorship progressively asserted itself. This paper begins elsewhere. It does not consider the site as backdrop or the building as

The author would like to thank the two anonymous reviewers for their comments and feedback, as well as Christiane Groeben and Andrea Travaglini at the Archivio Storico della Stazione Zoologica Anton Dohrn for their generous assistance with archival research.

<sup>1</sup> Literatures from historians of science on the Naples Zoological Station are too vast to enumerate. Particularly useful to this paper are the ones concerning the relationship between science and place, which has become a focus of research in history of science in recent decades. See, in particular, Irmgard Müller, *Die Geschichte der Zoologischen Station in Neapel von der Gründung durch Anton Dohrn (1872) bis zum Ersten Weltkrieg und ihre Bedeutung für die Entwicklung der modernen biologischen Wissenschaften* (Habilitationsschrift, Universität Düsseldorf, 1976); Lynn Nyhart, “Civic and Economic Zoology in Nineteenth-Century Germany, The ‘Living Communities’ of Karl Möbius”, *Isis* 89 no. 4 (1998): 605–630; Raf De Bont, “Between the Laboratory and the Deep Blue Sea: Space Issues in the Marine Stations of Naples and Wimereux”, *Social Studies of Science* 39, no. 2 (April 2009): 199–227; Raf De Bont, *Stations in the Field: A history of place-based animal research, 1870–1930* (University of Chicago Press, 2015), 51–69; Katharina Steiner, “Copepods and Fisherboys: Advanced Biological Research and Street Poverty in the City of Naples”, in *Urban History of Science: Making Knowledge in the City, 1820–1940*, ed. Oliver Hochadel and Agustí Nieto-Galan (Routledge, 2019), 80–101; Christiane Groeben, “Marine Biology Studies at Naples: The Stazione Zoologica Anton Dohrn”, and Katharina Steiner, “The Scientific Fishery: Sampling, Dissecting, and Drawing in the Gulf of Naples”, in *Why Study Biology by the Sea?*, ed. Karl S. Matlin, Jan Maienschein, and Rachel A. Ankeny (University of Chicago Press, 2020), 29–67, 144–166. Scholarly interest in the Naples Zoological Station from the perspectives of architectural history and media history are more recent yet fast-growing. See Christina Wessely, “Wässrige Milieus. Ökologische Perspektiven in Meeresbiologie und Aquarienkunde um 1900”, *Berichte Zur Wissenschaftsgeschichte* 36, no. 2 (2013): 128–147, translated by Nathan Stobaugh as “Watery Milieus: Marine Biology, Aquariums, and the Limits of Ecological Knowledge circa 1900”, *Grey Room* 75 (2019): 36–59; Riccardo Florio, *L'architettura delle idee. La stazione zoologica Anton Dohrn di Napoli* (Artstudiopaparo, 2015); Martina Motta, “The Aquarium and the Globe: The Zoological Station at Naples in 1872”, accessed October 4, 2021, <https://ext.maat.pt/longforms/aquarium-and-globe-zoological-station-naples-1872>.

<sup>2</sup> Raf de Bont points out that due to the unfavorable particularities of Naples, Dohrn's initial intention to facilitate observations within the animal's situated complexity led to the precise opposite, as the station ended up confining the sojourning zoologists indoors and detached them further away from the field. It became assimilated within the logic of urban industrialization, evolving into a veritable “factory” of science with a sophisticated division of labor – local fishermen delivered animal materials to the doorstep every morning, specialists in the sorting room prepared the standardized specimens, and zoologists directly found the living or freshly killed materials on the working table or in the tanks. Such an argument essentially presents the zoological station as a placeless fortress sheltering an enclave against a “hostile” foreign environment, enabling undisturbed research within a completely artificial setting. See De Bont, *Stations in the Field*. De Bont's argument has met disagreements, notably, from Steiner, “Copepods and Fisherboys.”

product, but traces the aquarium's emergence as a situated outcome of improvised alignments and unforeseen collaborations among scientists, municipal officials, foreign patrons, local publics, and marine life itself.

To claim that the *laboratory* necessarily entails sundry forms of *co-laboration* verges on the tautological. Despite an obscure etymology, the early modern conversion of the unclassical Latin noun *laboratorium* – literally, “the place for labor” – into scientific usage already measures the force of the epochal rise of what came to be known as modern science: slowly yet definitively, *scientia* shifted from a mode of knowing to a kind of laborious activity<sup>3</sup>, a reminder that its product – the matter of “fact” – is indeed a *factum*, “a thing done”. Increasingly, to factualize was to (co)labor in the disciplined space of the laboratory, through the mediation of purportedly designed apparatus, and with the application of collective human labor. Yet from the outset, such collectivity was not merely a matter of co-working within the lab but also depended on an external audience as indispensable participants in science's fact-making, principally for two reasons: on the one hand, experimental science required eyewitnesses of proven discernment and trustworthiness, whose testimony secured the scientific fact's credibility and communicability; on the other, experimental demonstrations were, from the very moment of their enactment, a form of persuasive rhetoric conjured to court patronage and support. Often overlapped, these two imperatives of visibility drew an array of non-specialists from distinguished aristocrats to learned visitors to the laboratory's doorstep<sup>4</sup>. In other words, the production of true, non-rhetorical knowledge relied on an exhibitionism that would, at times, turn the laboratory into a theatre.

Preparing for a visit from King Charles II to the Royal Society, its cofounder and former president Christopher Wren insisted that while excessive theatrical flourish might risk reducing the natural philosopher into a mere “juggler”, the demonstration ought to require “something of a pomp” to ward off the tedium of a prolonged lecture and sustain the appeal of natural philosophy under kingly auspices<sup>5</sup>. The key to the problem, according to Wren – the architectural virtuoso of London's Baroque resurrection from the 1666 fire and whose vast oeuvre had encompassed several major playhouses – was to let spectacle glitter just enough to stir wonder therefore secure patronage, but not so much as to eclipse the gravitas of the truth at hand. As Robert Boyle famously averred when demonstrating his air pump trials at the Royal Society, the witnessing must assume the form of a “public” performance – albeit a highly restricted one, as his critics like Thomas Hobbes were quick to point out<sup>6</sup>. On display were not only the piston vacuum pumps he built, but also vacuum's otherwise invisible effect that typically concerned, in Boyle's words, “the duration of a bird's life” while the air was withdrawn<sup>7</sup>, as concern for suffocating animals gave way to the curiosity of huddled onlookers.

How the forced labor of living creatures – through their staged asphyxiation – helped forge Enlightenment epistemology lies beyond the focus here. Instead, specifically regarding the conflation of the laboratory and the theatre, the paper provides an appraisal of the architectural repercussions of unconventional forms of (co)labor relations, especially when involving nonhumans, in the collective and already-highly institutionalized production of scientific knowledge.

<sup>3</sup> On the emergence of the word *laboratory* in its modern sense, see Owen Hannaway, “Laboratory Design and the Aim of Science: Andreas Libavius versus Tycho Brahe,” *Isis* 77, no. 4 (December 1986): 585–586 (584–610).

<sup>4</sup> On the double role of experimental demonstration in early modern Europe, see Jan Golinski, *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760–1820* (Cambridge University Press, 1992).

<sup>5</sup> Christopher Wren, 30 July/9 August 1663, in Thomas Birch, *The History of the Royal Society of London for the Improving of Natural Knowledge, from Its First Rise* 4 vols. (Royal Society, 1756–1757), 1: 288, as cited in Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump* (Princeton University Press, 1985), 31.

<sup>6</sup> On this debate, see the well-known discussion in Shapin and Schaffer, *Leviathan and the Air Pump*.

<sup>7</sup> Robert Boyle, *The Philosophical Works of the Honourable Robert Boyle Esq.: Abridged, Methodized, and Disposed under the General Heads of Physics, Statics, Pneumatics, Natural History, Chymistry, and Medicine*, ed. Peter Shaw, vol. 2 (W. and J. Innes, 1725), 525.

## Outfitting Water-Biology

In mid-October 1868, Anton Dohrn, then a 28-year-old entomology *Privatdozent* (“private lecturer”) at Jena and former student of Ernst Haeckel<sup>8</sup>, arrived in Messina for the first time after spending two consecutive summers at Millport in Scotland. The trip to Sicily, in part a grand tour, provided solace amid his battle with recurrent depression, at a time when his career prospects as a zoologist appeared bleak<sup>9</sup>. Italy was the place for the Germans where such escapism was still possible, needless to mention a deep-rooted Prussian tradition of fetishizing an unspoiled Italy and especially the Mezzogiorno, which had been profoundly bound up with a shared elitist desire for self-discovery. To be sure, Dohrn’s zoological *Italienfahrt* was not unlike those of a long list of northerly naturalists that strolled along the Sicilian shore since the eighteenth century, from Spallanzani, Lyell, and Milne-Edwards to his Goethean fellow countrymen Müller, Krohn, and notably Haeckel<sup>10</sup>. All of them reveled in the striking abundance of marine fauna at the Strait of Messina, where tidal currents caused upwelling that facilitated more efficient capture of interested organisms<sup>11</sup>. Yet for Dohrn, new realities had unfolded: as Germany edged toward unification and imperialism, its path became increasingly entwined with Italy’s protracted Risorgimento, a parallelism founded on mutual assistance at the same historical moment, set to culminate in 1870 with Italy reclaiming Rome from French control amid the Franco-Prussian War. The era marked the zenith of an Italo-Prussian brotherhood discourse that had been brewing since the early 1860s, compelling Germany to reconceive Italy from a timeless cultural muse to a contemporary political entity<sup>12</sup>. It seemed natural that a need for a stationary facility would surface at Messina, as Dohrn, “like a knight-errant”<sup>13</sup>, carried along a homemade dismountable aquarium of three feet long, two feet wide, and one foot five inches high that amounted to two Zentner (about 100 kilograms)<sup>14</sup>. These reportedly “unusual, not very pilgrim-like, formless, and over-heavy” cases of slate and thick glass panels<sup>15</sup>, constructed at Millport with the help of his Scottish host and former glass vendor David Robertson, were intended to address the vital needs of running seawater and oxygen input for the daily hauls’ survival<sup>16</sup>. Transported by steamer from Glasgow to Sicily, the cumbersome equipment proved “of incalculable use” for his embryological pursuits<sup>17</sup>. Upon their chance encounter, Dohrn and Nicholas Miklouho-Maclay, another student of Haeckel and an old acquaintance, extended considerable effort but “to no avail” in erecting an improvised laboratory<sup>18</sup>. “Spontaneously”, the two self-mockingly quixotic wayfarers fantasized the benefits of a zoological station on a permanent basis<sup>19</sup>. Prone to italicizing, Miklouho-Maclay retrospectively insisted in writing that at the Strait of Messina, a well-furnished laboratory where research was “undisturbed and undisturbing” had been an “absolute necessity”<sup>20</sup>.

To reiterate: this architectural necessity was *not* driven by the observation of marine life in its natural habitats, but by the observation of organisms that *had been relocated to an aquarium*. In other words, the research here was premised on an emergent disciplinary site, in the shape of a seaside glass cuboid, that required novel forms of infrastructural underpinning. The wanted station bore out a set of concerns and practices that were to consolidate as “water-biology,” as discussed by Christina Wessely, over the course of the second half of the nineteenth century. According to

<sup>8</sup> In German universities, a *Privatdozent* is an unsalaried university lecturer.

<sup>9</sup> Theodor Heuss, *Anton Dohrn: A Life for Science*, trans. Liselotte Dieckmann (Springer-Verlag, 1991), 74.

<sup>10</sup> See Christiane Groeben, “Anton Dohrn: The Statesman of Darwinism”, *Biological Bulletin* vol. 168, Supplement: The Naples Zoological Station and the Marine Biological Laboratory: One Hundred Years of Biology (June, 1985): 4-25 (7); Jennifer Frazer, “Proteus: How Radiolarians Saved Ernst Haeckel”, *Scientific American* (January 31, 2012).

<sup>11</sup> Antony Adler, *Neptune’s Laboratory: Fantasy, Fear, and Science at Sea* (Cambridge and London: Harvard University Press, 2019), 55.

<sup>12</sup> See Wilhelm Lang, *L’unita tedesca e l’unita italiana: memoria* (Salviucci; Libreria Internazionale Ermanno Loescher, 1871); Heinrich von Treitschke, “Cavour” (1867), in *Historische und politische Aufsätze: Neue Folge*, 2 vols. (S. Hirzel, 1870), 349-494.

<sup>13</sup> Anton Dohrn, “Der gegenwärtige Stand der Zoologie und die Gründung zoologischer Stationen”, *Preußische Jahrbücher* vol. XXX (1872): 144 (137-161).

<sup>14</sup> Müller, *Die Geschichte der Zoologischen Station in Neapel*, 79.

<sup>15</sup> Heuss, *Anton Dohrn*, 75.

<sup>16</sup> Müller, *Die Geschichte der Zoologischen Station in Neapel*, 78. See also Christiane Groeben, “The Stazione Anton Dohrn as a Place for the Circulation of Scientific Ideas: Vision and Management”, in *Information for Responsible Fisheries: Libraries as Mediators; Proceedings of the 31st Annual Conference, Rome, Italy, 10-14 October 2005*, ed. K. L. Anderson and C. Tony (IAMSLIC, 2006), 291-299 (293).

<sup>17</sup> “Damit tritt ein Element in die zoologische Methodik ein, das bisher zu wenig benutzt und ausgebeutet wurde, was aber von unberechenbarem Nutzen sein wird, falls es gelingt, es bequem und transportabel herzustellen. “Anton Dohrn to Fanny Lewald and Adolf Stahr, November 9, 1868 (Archivio Storico della Stazione Zoologica Anton Dohrn).

<sup>18</sup> “Troß ziem lich reicher Ausstattung mit Instrumenten und Büchern muß ich doch, will ich der Wahrheit die Ehre geben, bekennen, daß meine Leistungen weit hinter meinen Erwartungen zurückblieben. Nicht viel besser ging es meinem russischen Gefährten, Miclucho Maclay”. Dohrn, “Der gegenwärtige Stand der Zoologie”, 145.

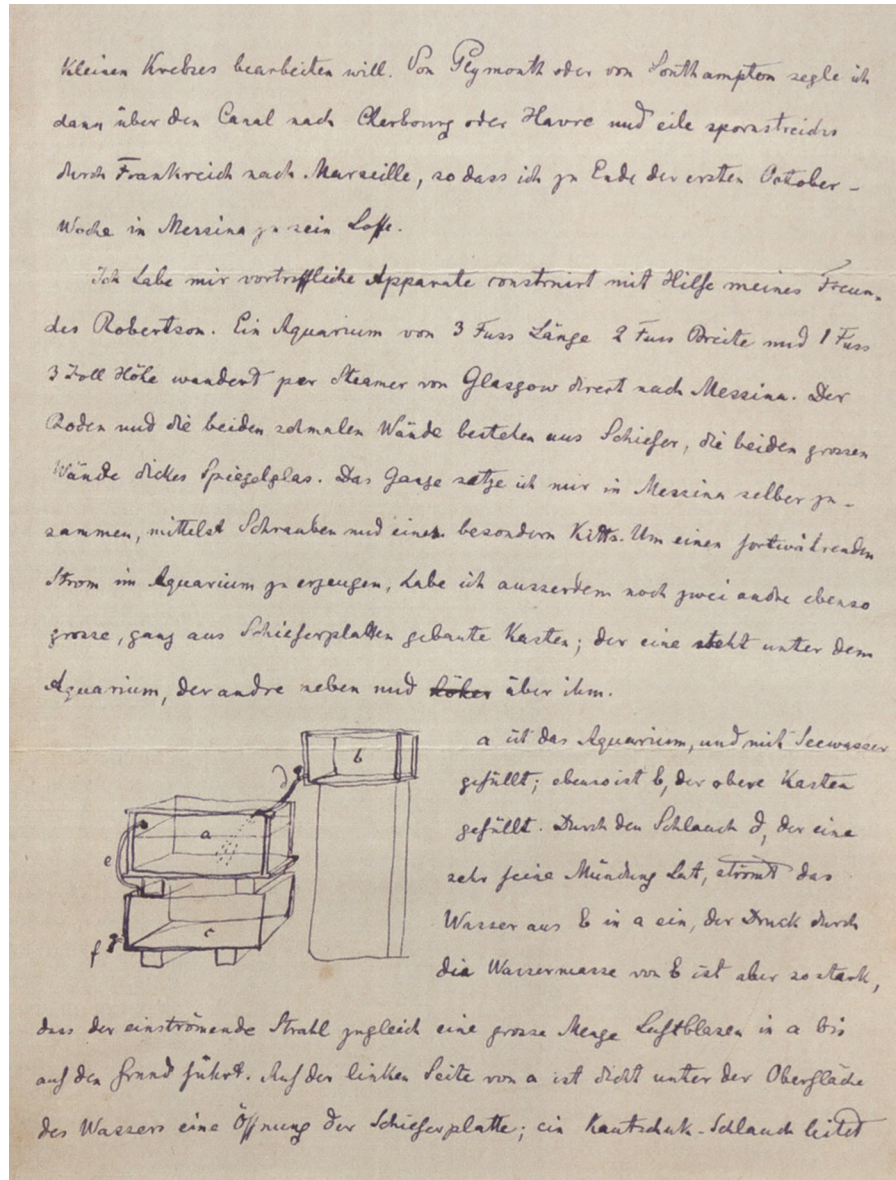
<sup>19</sup> “Wir waren leibhafte Bei spiele für jene beiden oben erörterten Fälle der nuglos verschwendeten Arbeitskraft und wir beide wurden spontan dazu gebracht über die großen Vortheile nachzudenken, die wir von einem wohleingerichteten Laboratorium hätten haben können”. Dohrn, “Der gegenwärtige Stand der Zoologie”, 145.

<sup>20</sup> Nicholas Miklouho-Maclay, “Proposed Zoological Station for Sydney”, *Proceedings of the Linnean Society of New South Wales*, 3 (1879), 144-150 (146; 145).



## 6.1

Anton Dohrn, sketch for a "transportable aquarium", in Anton Dohrn to Adolf Stahr, September 3, 1868. BSB Ana 525.Ba 1237, Bayerische Staatsbibliothek. Dohrn wrote, "Der Boden und die beiden schmalen Wände bestehen aus Schiefer, die beiden grossen Wände dickes Spiegelglas...Um einen fortwährenden Strom im Aquarium zu erzeugen, habe ich ausserdem noch zwei andere ebenso grosse, ganz aus Schieferplatten gebaute Kasten; der eine steht unter dem Aquarium, der andere neben und über ihm. a ist das Aquarium, und mit Seewasser gefüllt; ebenso ist b, der obere Kasten gefüllt. Durch den Schlauch d, der eine sehr feine Mündung hat, strömt das Wasser aus b in a ein, der Druck durch die Wassermasse von b ist aber so stark, dass der einströmende Strahl zugleich eine grosse Menge Luftblasen in a bis auf den Grund führt. Auf der linken Seite von a ist dicht unter der Oberfläche des Wassers eine Öffnung der Schieferplatte; ein Kautschuk-Schlauch leitet von dort ebenso viel Wasser als fortwährend aus b zuströmt, nach C ab; dadurch entsteht in a ein ununterbrochenes Strömen und ein fortdauerndor Luft- und Wasserwechsel. Sobald C gefüllt ist, öffne ich einen Hahn, und lasse in ein kleines Gefäss Wasser ausfliessen, das wieder in b eingefüllt wird. So ist der Kreislauf fertig".



<sup>21</sup> On the rise of the water-biological paradigm and its dependence on the aquarium, see Wessely, "Watery Milieus." See also Christian Reiß, "Gateway, Instrument, Environment: The Aquarium as a Hybrid Space between Animal Fancying and Experimental Zoology", *N.T.M.* 20 (2012): 309-336.

<sup>22</sup> Wessely, "Watery Milieus", 41.

<sup>23</sup> For a larger "aquacultural" movement to transplant ocean to the earth, see Darin Kinsey, "'Seeding the Water as the Earth': The Epicenter and Peripheries of a Western Aquacultural Revolution", *Environmental History* 11 (July 2006): 527-566.

<sup>24</sup> "Biology has undergone a complete revolution by Mr. Darwin's great work. This revolution has augmented the number of special problems in such enormous proportions that biology is now completely at a loss to solve all these problems by the aid of the means placed hitherto at its disposal, and looks pretty much like a boy who has suddenly grown in one year out of all his clothes, presenting the ridiculous aspect of a man in a child's dress". Anton Dohrn, "The Foundation of Zoological Stations". *Nature* vol. 5 (1872): 277-280 (277). Author's italics.

<sup>25</sup> "The thing which a father would do for his boy would be to go and buy another dress". Dohrn, "The Foundation of Zoological Stations": 277.

<sup>26</sup> Anton Dohrn to Charles Darwin, 30 December 1869, Darwin Correspondence Project, "Letter no. 7038", accessed December 23, 2023, <https://www.darwinproject.ac.uk/letter?docId=letters/DCP-LETT-7038.xml>.

Wessely, "water-biology" (*Wasserbiologie*) is a term that rose to prominence around 1900 to encompass marine and limnological research on aquatic organisms, with a particular focus on their relationships with the watery surroundings. Such an epistemic turn, as it is argued, owed a striking debt to the technologies of the aquarium – not as a media of wonder, but as a research instrument for the collection, stabilization, and observation of vital milieus, which inadvertently led to an eruption of environmental considerations that laid the groundwork for modern ecology<sup>21</sup>. As a result, "animal geography first gained its ecological orientation through marine research"<sup>22</sup>. Suffice it to say that the attendant epistemic practices were intrinsically land-based, for the sake of extracting marine life's "mode of ordinary existence" out of the ocean, only to replicate it on *terra firma*<sup>23</sup>. The Cervantine mixture of hardship and jocularly was telling of the insufficient "means" of his water-biological research, which, in Dohrn's habitually figurative language, was "like a boy" who abruptly overgrew all his clothes to present "the ridiculous aspects of a man in a child's dress"<sup>24</sup>. Almost evoking Gottfried Semper's *Bekleidung*, Dohrn urged that the "father" would simply "go



and buy another dress”<sup>25</sup>. In due course, Dohrn wrote to Darwin about the want of a permanent station at the strait with “a little house of perhaps four rooms, an aquarium connected with the sea and the house, – the aquarium of perhaps 60 feet in cubes, where one might have streaming water, – a boat for dredging work, dredges, nets, ropes [...] glasses, larger tumblers, bottles [...] acids and other chemical objects, and lastly a library”, in short, “all that is necessary for a marine zoologist”<sup>26</sup>. As Dohrn intended here, water-biology’s *outfit* – the vestimentary word once meant the act of fitting out a ship for an expedition – was spartan yet exhaustive. In essence, it was simply a seaside shelter for a running-water aquarium.

Should these pragmatistic aspirations come through, Dohrn’s “little house” would have been akin to the “chalets” of his French rivals, be it Alfred Mathieu Giard at Wimereux or Giard’s teacher Henri de Lacaze-Duthiers at Roscoff, which were typically characterized by an architectural approach that has been understood as unassuming and “anti-monumental”<sup>27</sup>. Despite the rising anti-French sentiment that peaked with the War of 1870–71, in which Dohrn enlisted, francophobia did not account for his veer towards Naples that resulted in everything but “little”, though it manifestly fueled the mutual antipathy between Dohrn and Lacaze-Duthiers<sup>28</sup>. Obviously, one must explicate the impending reality that in less than three years, a palatial structure spanning 7,000 square feet, encompassing 53 public aquarium tanks, 24 laboratories, a 25,000-volume library, with living quarters, would grace the Neapolitan city center<sup>29</sup>.

## 6.2

Naples Zoological Station, first building, constructed March 1872 to September 1873. Unknown photographer, 1873. Archivio Storico della Stazione Zoologica Anton Dohrn.

<sup>27</sup> See Edward Eigen, “Between Stations and Habitations: The Architecture of French Science at the Shore, 1830-1900” (PhD diss., MIT Department of Architecture, 2000), especially Chapter V, “The Double Program: Part One, Research”, 175-213. For a comparative analysis of the zoological stations of Dohrn and Giard, see De Bont, “Between the Laboratory and the Deep Blue Sea”.

<sup>28</sup> On Dohrn’s fraught relationship with French biologists, notably Lacaze-Duthiers, see Jean Louis Fischer, “L’aspect social et politique des relations épistolaires entre quelques savants français et la Station zoologique de Naples de 1878 à 1912”, *Revue d’histoire des sciences* 33, no. 3 (1980): 225-251.

<sup>29</sup> Brian K. Hall, “Tapping Many Sources: The Adventitious Roots of Evo-Devo in the Nineteenth Century”, in *From Embryology to Evo-Devo: A History of Developmental Evolution*, ed. Manfred D. Laubichler and Jane Maienschein (The MIT Press, 2007), 467-497 (477).



<sup>30</sup> These literatures have consistently considered the Naples Zoological Station as the “most influential,” “most important,” “most successful,” or “ground-breaking”, essentializing a progressivist narrative that is not to be repeated here.

<sup>31</sup> Theodor Heuss compiled Anton Dohrn’s biography for Dohrn’s centenary in 1940. Heuss served as the first president of West Germany from 1949 to 1959. See Theodor Heuss, *Anton Dohrn in Neapel* (Atlantis, 1940). The English translation (titled *Anton Dohrn: A Life for Science*) came out in 1991.

<sup>32</sup> Quoted in Heuss, *Anton Dohrn*, 88.

<sup>33</sup> Quoted in Theodor Boveri, “Anton Dohrn”, *Science* 36, no. 928 (October 11, 1912): 453–468 (459).

<sup>34</sup> Quoted in Heuss, *Anton Dohrn*, 89.

<sup>35</sup> Boveri, “Anton Dohrn”, 459.

<sup>36</sup> See Tommaso Astarita, “The Grand Tour Heads South”, in *Between Salt Water and Holy Water: A History of Southern Italy* (W. W. Norton & Company, 2005), 220–275.

<sup>37</sup> Heuss, *Anton Dohrn*, 90.

<sup>38</sup> “I have already calculated that for 120 visitors daily for 9 months of the year I can have profits, running, and everything. And how many more will come! The splendour of the animals. The boredom of the people! And in rainy weather! you must congratulate me, the idea is ready money, freedom, independence, and a nice home for my dear friends in Naples!” Anton Dohrn to Fanny Lewald and Adolf Stahr, January 13, 1870. Quoted in Christiane Groeben, in collaboration with Irmgard Müller, trans. Richard and Christl Ivell, *The Naples Zoological Station At the Time of Anton Dohrn: Exhibition and Catalogue* (Goethe Institut, 1975), 11. On a different occasion, Dohrn wrote that “I saw at a certain distance even the possibility of erecting other stations with the surplus of the Naples income, and giving in such a way quite a new development to biological science [...]”. Dohrn, “The Foundation of Zoological Stations”, 278.

<sup>39</sup> “Als im weiteren Verlaufe des Baues es bald klar ward, dass ein solcher Erfolg (covering the operating costs from the entrance fees) nicht zu erwarten war [...]”. Anton Dohrn, *Erster Jahresbericht der Zoologischen Station in Neapel* (Engelmann, 1876), 1. Upon the aquarium’s opening, Dohrn soon realized the entrance income would not be enough for maintaining the station, and devised the “table system” in addition to limited subvention from the German government: for an annual fee, the contract partner (universities, ministries of education, scientific institutions, private individuals) was granted the right to nominate one scientist to use a table for one year.

<sup>40</sup> “One of the great innovations in the techniques of power in the eighteenth century was the emergence of ‘population’ as an economic and political problem: population as wealth, population as manpower or labor capacity, population balanced between its own growth and the resources it commanded.” Michel Foucault, *A History of Sexuality: An Introduction*, trans. Robert Hurley (Vintage Books, 1990), 25.

## The Metropolis and Marine Life

It is not the occasion or intent here to reiterate the Naples Zoological Station’s extensively covered establishment in 1872, which has afforded a large number of historical narratives richly deserving of readers<sup>30</sup>. Neither is it to recapitulate a *Bildungsroman*-like biography of its celebrated founder, who justly merited the consideration as a subject by West Germany’s first president<sup>31</sup>. Rather, the proposition is that unlike the many other marine stations which were sited chiefly for their surrounding zoological wealth, Dohrn’s station was positioned at the Bay of Naples principally due to, if not entirely dictated by, its proximity to a bustling former capital city of half a million, by far Italy’s most populous. Which is to say that the metropolitan center, while typically eschewed by field biologists of the time who sought to break with the silent confines of the cabinet, became at Naples marine research’s bedrock.

The cause of the turn to Naples was economic (strictly, *oiko-nomic*, “household management”): as 1869 drew to a close, Dohrn’s unsuccessful attempt to solicit financial assistance from his very own father led to their “complete break”, forcing him to go on his own account<sup>32</sup>. Albeit affluent, his father firmly refused every appeal for aid and believed the son was chasing a will-o’-the-wisp. The about-turn was rather spontaneous, verging on epiphanic, even with a date and venue: on the fourth of January, 1870, as Dohrn pensively rode in a mail coach from Apolda to Jena, Alfred Brehm’s newly opened Berlin Aquarium on Unter den Linden occurred to him “like a revelation”<sup>33</sup>. He was hit by the thought of “a large aquarium on the Mediterranean”<sup>34</sup>, and such an “entirely original” idea, essentially to divert public aquarium income to fund marine science within a double-programmed building, demanded “a large, much-visited city rich in fauna”, a distinction arguably unique to Naples<sup>35</sup>. The metropolis of South Italy was suddenly singled out – out of the blue (sea) – as a “solution” to a Prussian paternal discord, by virtue of its 450,000 Neapolitans, an age-old tourist industry, its wonders, myths, foreigners, and clichés. Even the local color amid the roaring chaos was a source of attraction, which came to be increasingly portrayed in orientalist terms of fascinating vulgarity<sup>36</sup>.

With “disarming innocence” in business matters<sup>37</sup>, the unworldly entomologist figured out that drawing 120 visitors daily for 9 months would suffice for the zoological station’s upkeep. Considering metropolitan ennui and the sirocco-stirred rainy days, Dohrn enthused in self-satisfaction over “how many more will be coming” for the “splendor of the animals”<sup>38</sup>. The point is that, what drew Dohrn to Naples was neither zoological abundance nor statistical reasoning (his unsophisticated financial forecasts turned out to be significantly off the mark)<sup>39</sup>, but *metropolitan life* (human and nonhuman) as an exploitable economic abstraction. Besides echoing the Foucauldian problematic of “population as wealth” in biopolitical terms<sup>40</sup>, Dohrn’s plan was fundamentally premised on the belief that in the metropolis, science could literally and exclusively feed on the human consumption and exploitation of spectacularized animal labor. In other words, unlike any preceding research programs including Dohrn’s own, which typically depended on royal patronage, governmental grants, university fellowships, or private donations, the kind of biological research devised here was downright buttressed by a profitable animal theatre in the name of public good.



The aquarium tank, integral to the tightly interwoven developments of coastal marine stations and metropolitan aquaria, anchored their physical convergence at the Bay of Naples. Not only did Dohrn draw on its twofold attributes as both a research tool and an electrifying marvel; he was actually engineering a hybrid of scientific instrumentality and urban sensation within the same structure, by leveraging popular appeal to financially fortify science. Stemming from the mid-century Victorian bourgeois living room, the aquarium craze was rooted in the newly established principles of self-sustainability within a glass case, further propelled by innovative aeration and filtration systems most notably introduced by the Crystal Palace's aquarist William Alford Lloyd<sup>41</sup>. Outside Italy, major metropolitan centers had seen how it converted the ocean, the utterly inaccessible, into an aesthetic event that would soon border kitschiness<sup>42</sup>, although in Naples it remained an unheard-of novelty<sup>43</sup>. Having appreciated Lloyd's technical prowess in 1866 while visiting Germany's first saltwater aquarium in Hamburg, Dohrn would promptly transplant Lloyd's mechanical contrivances to Naples. The crux of the matter is that the extraction of wildlife was to unfold as a dual assault, driven by two imperatives at the same time: the onstage display of deep-sea creatures for public amazement, and the behind-the-scenes laboratorial experimentation for water-biological knowledge production, both requiring living marine beings in artificial milieux, with the former underpinning the latter. Such an underpinning was literalized by Dohrn's

### 6.3

Aquarium tank dedicated to Echinoderms (hedgehogs, stars, lilies) at the Naples Zoological Station, photograph by Johannes Sobotta, 1898. Archivio Storico della Stazione Zoologica Anton Dohrn.

<sup>41</sup> Samantha Muka, *Oceans under Glass: Tank Craft and the Sciences of the Sea* (The University of Chicago Press, 2022); Bernd Brunner, *The Ocean at Home: An Illustrated History of the Aquarium* (Princeton Architectural Press, 2003).

<sup>42</sup> On this point, see Adamowsky, Chapter 4, "Mise-en-scène: Invented Realities, or the Mediality of Wonders", in *The Mysterious Science of the Sea*, 101-144; Celeste Olalquiaga, "Oceanic Architecture", in *The Artificial Kingdom: A Treasury of the Kitsch Experience* (University of Minnesota Press, 1998), 147-158.

<sup>43</sup> "And of course, nobody knew what an aquarium was". Heuss, *Anton Dohrn*, 94.



Anton Dohrn, sketch for the zoological station, in Anton Dohrn to Adolf Stahr, April 13, 1870. BSB Ana 525.Ba 1273, Bayerische Staatsbibliothek.

<sup>44</sup> I will get back to this point in the following. On Renaissance palazzi of the botteghe, see Fabrizio Nevola, "Home Shopping Urbanism, Commerce, and Palace Design in Renaissance Italy", *Journal of the Society of Architectural Historians* 70, no. 2 (June 2011): 153-173.

<sup>45</sup> Müller, *Die Geschichte der Zoologischen Station in Neapel*, 84.

<sup>46</sup> "A rhetorician then," says Socrates, with his tranquil arrogance, "isn't concerned to educate the people assembled in lawcourts and so on about right and wrong; all he wants to do is persuade them. I mean, I shouldn't think it's possible for him to get so many people to understand such important matters in such a short time". Quoted in Bruno Latour, "Socrates and Callicles' Settlement, or the Invention of the Impossible Body Politic", *Configurations* 2 (Spring 1997): 189-240.

<sup>47</sup> On forming "alliances" as a precondition for developing new instruments or founding new institutions, see Bruno Latour, "Science's Blood Flow: An Example from Joliot's Scientific Intelligence", in *Pandora's Hope: Essays on the Reality of Science Studies* (Harvard University Press, 1999), 80-112 (103-104).

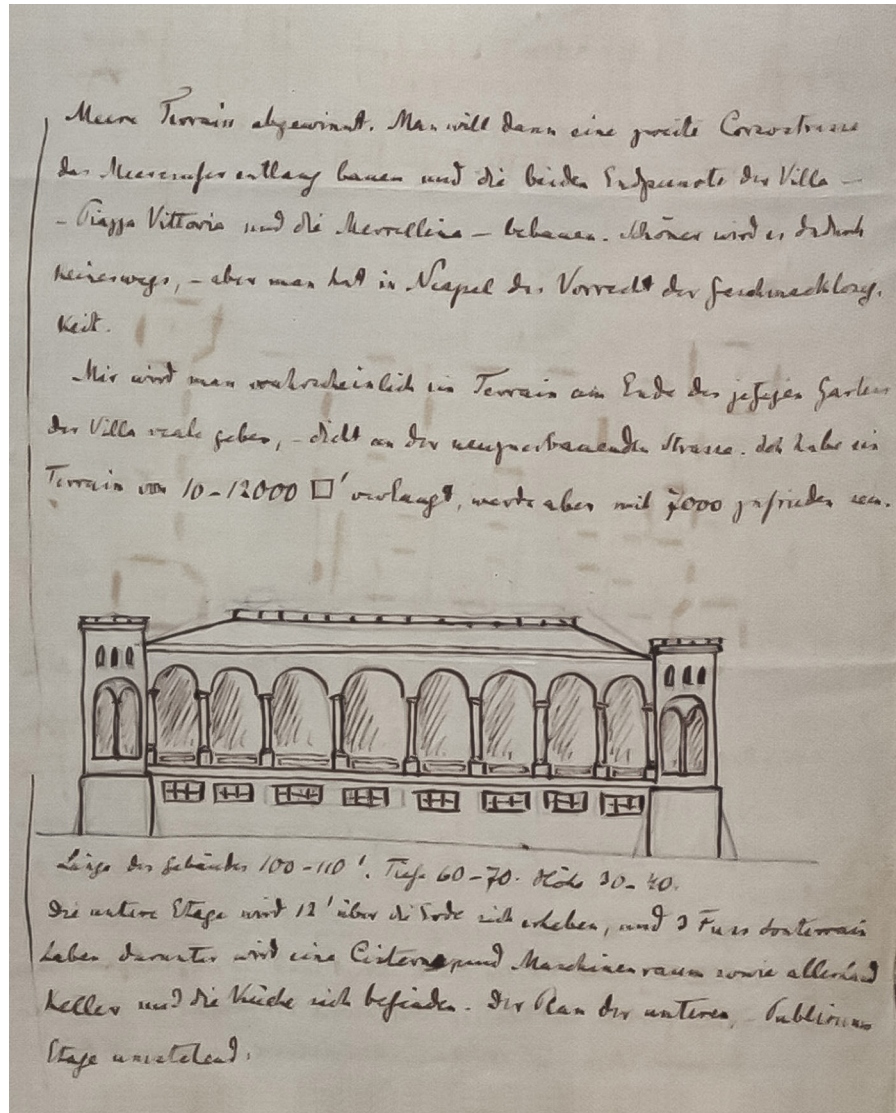
<sup>48</sup> "Dabei zog ich ein Stück Papier aus der Tasche, auf das ich einige Tage zuvor mit Feder und Tinte eine Skizze geworfen hatte, wie das Gebäude der Zoologischen Station wohl von aussen erscheinen sollte." Anton Dohrn, "Die Erbauung der Zoologischen Station von Neapel", unpublished manuscript (1876), 2. Archivio Storico della Stazione Zoologica Anton Dohrn.

<sup>49</sup> Eigen, "Between Stations and Habitations", 194.

<sup>50</sup> "Die Skizze gefiel Panceri, und er machte mir den Vorschlag zu versuchen, ob mir die Stadt Neapel nicht ein Terrain innerhalb der Villa Reale, des öffentlichen Gartens, abtreten würde." Dohrn, "Die Erbauung", 2. See also Antio Borrelli, "Paolo Panceri, Anton Dohrn e la fondazione della Stazione Zoologica di Napoli (in appendice lettere di P. Panceri a Anton Dohrn e a Bertrando Spaventa)", *Giornale critico della filosofia italiana* 20 (2000): 431-447.

<sup>51</sup> Renato Penna, "La Villa comunale di Napoli", in *Napoli nobilissima* v (1966): 19-33. Francesco S. Starace, "L'architetto dei Giardini", in *Carlo Vanvitelli*, ed. Benedetto Gravagnuolo (Alfredo Guida Editore, 2008), 171-216.

<sup>52</sup> Emily Nunn Whitman, "The Zoological Station at Naples", *The Century Magazine* 32 (May-October 1886): 791-99 (791).



architectural conception, where he positioned the revenue-generating public aquarium on the ground level to uphold the research alcoves aloft (like a Renaissance *bottega* ["shop"] palazzo)<sup>44</sup>, as indicated in an *erster entwurf* ("first draft") he himself sketched to persuade Naples's so-called *Stadtväter* (literally, "city fathers") in 1870<sup>45</sup>.

Veritably, it was about persuasion — as Bruno Latour quotes Socrates, "all he wants to do is persuade them, [...] to get so many people to understand such important matters in such a short time"<sup>46</sup>. And architecture, or rather the architectural *disegno*, was the means to forming "alliances", that is, "getting others interested"<sup>47</sup>, prior to any science, construction, or even the presence of any architect. It is said that during a visit to Paolo Panceri, a professor of comparative anatomy at the University of Naples, Dohrn "pulled out a piece of paper" on which he had roughed out a neoclassical palace with shaded loggias<sup>48</sup>. The image could not be more removed either from his "little house" or from Lacaze-Duthiers' claim of scientific modesty, who requested his architects at Banyuls-sur-Mer to adorn only with reliefs of langoustines and fish in place of columns<sup>49</sup>. Charmed by the drawing, Panceri suggested the middle of the Villa Comunale park along the Chiaia coast, and connected Dohrn with the Sindaco ("mayor") right away<sup>50</sup>.

84.



Strada Chiaja - Naples.

G.B.

## 6.5

George Wilson Bridges, "Strada Chiaja, Naples", 1846, photograph, salted paper print, 16.3×21.7cm. Courtesy of Canadian Centre for Architecture, Montréal.

6.5  
6.6, 6.7

Once called the "Villa Reale", the park was developed in the 1780s at the Bourbon king's behest as the *Real Passeggio* ("royal promenade"), albeit with limited public access barring "the poor, the barefooted, and other inappropriately dressed persons", under the direction of architect Carlo Vanvitelli<sup>51</sup>. Stretching along the Riviera di Chiaia from Chiatamone to Mergellina, it had just become municipal property in 1869 as the city's post-Risorgimento urban transformations were afoot, soon to grow into, according to one record, "the favorite resort of the gay world of Naples"<sup>52</sup>. Yet it was still the dress code that mattered and nothing more: despite an apparent indifference to Dohrn's "actual intentions and incentives [*eigentlichen Absichten und Triebfedern*]"<sup>53</sup>, the mayor "liked the sketch," and offered him the recommended site, free of charge, in exchange for the "richness and splendor" that would outshine all existing edifices<sup>54</sup>. Unwittingly, in outfitting zoology, Dohrn became implicated in the prolonged and violently ongoing history of Naples's artificial reshaping of its land-sea interface. He would soon find the zoological station concomitant with a vast municipality-led scheme to widen the seafront with a majestic new thoroughfare along the coast up to Posillipo, replacing the sandy shores with a palm-lined embankment that further enclosed the station within a wholly urbanized environment<sup>55</sup>.

<sup>53</sup> "Graf Capitelli, gegenwärtig Prefect von Bologna, interessirte [sic] sich für die Sache, obwohl ich zweifle, dass er sich viel um die eigentlichen Absichten und Triebfedern kümmerte, die mich leiteten". Dohrn, "Die Erbauung", 2.

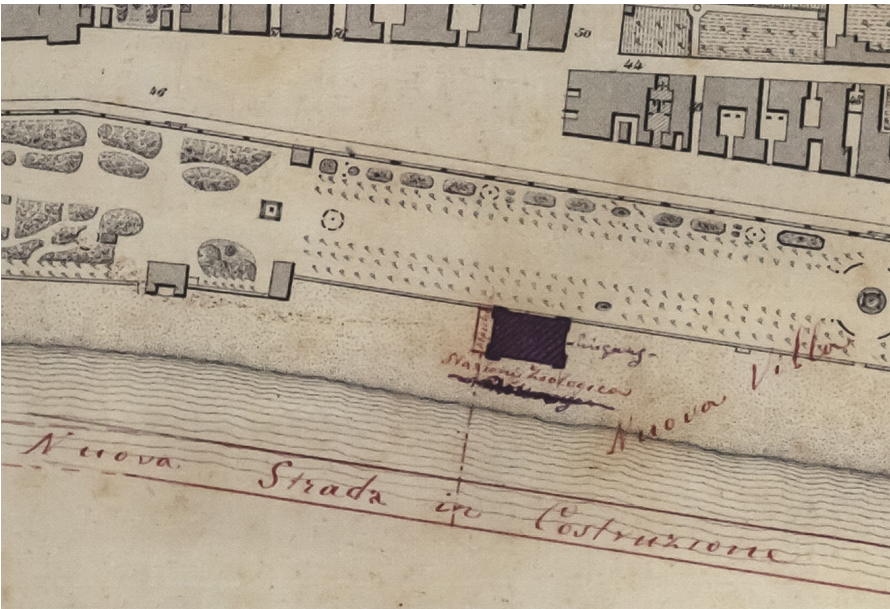
<sup>54</sup> Heuss, *Anton Dohrn*, 96.

<sup>55</sup> On this point, see Raf De Bont, Chapter 2, "Naples: Indoor Sea Creatures", in *Stations in the Field*, 51-69. For a comprehensive survey of the Chiaia seafront's urban transformation during this period, see Riccardo Florio, Chapter 1, "L'idea della Stazione", in *L'architettura delle idee. La stazione zoologica Anton Dohrn di Napoli* (Artstudiopaparo, 2015), 19-52.





6.6  
Pianta Topografica del Quartiere di Chiaia, Ufficio Superiore di Stato Maggiore – Sezione di Napoli, 1862. With handwritings in red and blue. From Riccardo Florio, *L'architettura delle idee. La stazione zoologica Anton Dohrn di Napoli* (Artstudiopaparo, 2015), 58-59.



6.7  
Handwriting in blue (by Anton Dohrn, date unknown, in German): *Eingang* (Entrance).



## Coda

By now, we discern that the architectural viability of Dohrn's station was contingent upon its resiting to the metropolitan center as real estate development that turned metropolitan life into inventive forms of exploitive economies. While the initial intent was merely to accommodate his seaside water tanks, the relocation brought about a whole set of adventitious attributes and labor processes including the public aquarium program, the spectacularization of living animals, and the monumentality of the architecture, transforming what was intended as an oceanfront cottage into a veritable *urban artifact*<sup>56</sup>. What can be termed the *metropolitan condition of marine science* was both incidental and foreign to the motivation of field research, as much as the zoological station itself was a foreigner's serendipitous expansion to the human engineering of the Neapolitan coastline. Yet it was precisely these secondary relationships that proved essential in enabling research in the first place.

My concluding remarks have to do with how Dohrn's scientific program kept co-operating with its metropolitan condition immediately after his station's establishment, a condition where Naples was reportedly "the dirtiest, raggedest, most obscene and squalid city of Europe", with an "openly barbarous" population whose nearest parallel could only be found in the "poorest Arab quarters" of Cairo<sup>57</sup>. Comparisons with Africa unapologetically abounded, as Naples came to be seen as categorically different from the rest of Europe especially in hygienic terms<sup>58</sup>. In 1884, a sweeping cholera outbreak was to claim 6971 human lives out of 504,700. It unfolded across the low-lying, seafront neighborhoods of Porto, Mercato, Vicaria, and Pendino, where the vast majority of deaths, caused by a salt-tolerant bacterium that spreads through contaminated drinking water and pathogen-infused shellfish, occurred<sup>59</sup>. It goes without saying that the severity was magnified by the stark absence of any sanitation infrastructure: the "huge elongated cesspools miscalled drains", clogged with "putrefying filth and street rubbish" of every kind<sup>60</sup>, funneled waste directly into the sea.

Indeed, while Naples itself was well-known for its insalubrious smells and foul water, Dohrn's station had amassed an aura of isolation akin to a (non-Italian, if not German) expatriate enclave<sup>61</sup> – an *air recueilli* ("composed atmosphere"), presenting a "striking" contrast with the *agitation ambiante* ("surrounding bustle"), according to an animated description by French zoologist Frédéric Houssay<sup>62</sup>. Compared with the worst-stricken neighborhoods populated with "wretched" forms of human habitation, from the underground cellars of the bassi to the "ghastly" *fondaci*<sup>63</sup>, the *sezione* of Chiaia, where Dohrn's station nestled, was "small and salubrious"<sup>64</sup>. Existing scholarship has drawn attention to the station's relative detachment from the "hostile" ambience of the Mezzogiorno. To the sojourning scientists from the north, Naples startlingly deviated from the emerging bourgeois sensitivities to urban order, tidiness, and privacy of Western Europe, as evidenced by their heightened reactions to the city's tumult, clamor, and filth<sup>65</sup>. Dohrn himself exclaimed, "Smell Naples and faint, hear Naples and go mad! [*Riech Neapel und werde ohnmächtig, höre Neapel und werde toll!*]"<sup>66</sup>. The detachment found expression in the architectural layout: just like how an early modern shop palazzo – say, Bramante's Palazzo Caprini – isolated the prelate's residence

<sup>56</sup> Aldo Rossi's widely acknowledged discussions of the urban artifact (*fatto urbano* in his Italian, or *faite urbaine* in French, denoting an "urban fact" as a result of collective making) is relevant here in that the Naples Zoological Station was brought to existence on the condition of its incidental monumentality. See Aldo Rossi, *The Architecture of the City*, trans. Diane Ghirardo and Joan Ockman (MIT Press, 1988).

<sup>57</sup> "The poorest Arab quarters Cairo are not defaced by scenes so foul and habits so unseemly; [...] no slums of any other city of Europe show a population so openly barbarous in their disregard of the decent modesties of the physical functions, as those who occupy the ground floors of the palazzi which line the principal thoroughfares of Naples. [...] Naples is the dirtiest raggedest most obscene and squalid city of Europe, [...] the disorder of her streets and the infection of the atmosphere raise moral and physical disgust, [...] her population is so poor that only 50,000 out of her population of 500,000 pay I was informed, any taxes". "Special Correspondence: Letters from Italy VI: Naples", *British Medical Journal*, April 5, 1884, 693-694.

<sup>58</sup> An oft-cited passage is from the French librettist Auguste Creuzé de Lesser, who wrote in 1806, "L'Europe finit à Naples, et même elle y finit assez mal. La Calabre, la Sicile, tout le reste est de l'Afrique. Dans la Sicile, par exemple, on ne trouve presque aucune des aises de la vie, presque aucune trace de civilisation". Auguste Creuzé de Lesser, *Voyage en Italie et en Sicile, 1801-02* (1806), 96.

<sup>59</sup> Andrea Bagnato, "We Must Disembowel Naples!", AA Files, no. 77 (2020), 39-43 (40). On the 1884 cholera outbreak in Naples, the most comprehensive account remains Frank M. Snowden, *Naples in the Time of Cholera, 1884-1911* (Cambridge University Press, 1995).

<sup>60</sup> "The huge elongated cesspools miscalled drains, without water to flush them and choked with every kind of putrefying filth and street rubbish, exhale, by gaping apertures, foul stenches, with which the whole air is thick". "Special Correspondence: Letters from Italy", 694.

<sup>61</sup> Up to the first half of the twentieth century, the staff at the station had been mostly German. The sense of German expat community was already evident in the building's design process: following intense conflicts, Dohrn dismissed the local architect Oscar Capocci, and completed the façade and interior decoration by calling upon his non-architect German friends including the proficient hands of Adolf von Hildebrand and Hans von Marées. There has been a huge literature on Hildebrand and Marées's work at the Naples Zoological Station, scattered in German, Italian, and English publications. Of particular interest to the discussions here is André Domrowski, "The Untimely Classicism of Hans von Marées", in *Modern Art and the Idea of the Mediterranean*, ed. Vojtěch Jirat-Wasiutynski (University of Toronto Press, 2007), 84-115. The brotherly duo was part of an artist circle of German expatriates settled in Florence and Rome, experimenting (as if scientifically) on what they understood as the essence of German "interiority" (*deutsche Innerlichkeit*)—essentially a new form of German Idealism, as Timothy Lenoir has argued within their "German Colony" in Italy. See Timothy Lenoir, "Politics of Vision: Optics, Painting, and Ideology in Germany, 1845-95", in *Instituting Science: The Cultural Production of Scientific Disciplines* (Stanford University Press, 1997), 131-178 (168-172).

"Main Entrance to the Aquarium", photograph by Emil Schöbel, date unknown. From Charles Atwood Kofoid, *The Biological Stations of Europe* (Government Printing Office, 1910).

<sup>62</sup> "Napoli! Napoli! Au sortir du vacarme de la plus tumultueuse des gares, tout ce qu'il faut voir hante déjà l'esprit. C'est la ville et le musée, le Vésuve, Pompéi, Pausilippe, Sorrente, les îles divines d'Ischia et de Capri ; combien de choses encore ! Mais remettant le reste à plus tard, le zoologiste descend d'abord le long de la Chiaia, à travers les jardins de la Villa nationale, jusqu'àuprès d'un grand bâtiment d'aspect neuf, aux larges baies cintrées. Son air recueilli fait un assez frappant contraste avec la gaité et l'agitation ambiante, et les mots de *Stazione zoologica* le désignent comme l'un des organes dont nous parlions à l'instant, avec lesquels la science contemporaine perçoit les phénomènes de la vie marine." Frédéric Houssay, "Les Laboratoires maritimes: Naples et Banyuls-sur-Mer", *Revue des Deux Mondes* 3e période, 120 (1893): 168-186.

<sup>63</sup> "Upon a surface of eight square kilometres (amount of surface that has been built over there) dwell no less than 461,962 human beings. And according to the official statistics no less than 128,804 of these people inhabit underground dwellings, and cellars. But there is something worse than these 'bassi' and 'sottoterrani'; another step down the shelving ladder of society and we come to a still more wretched form of habitation—to the 'fondaci' [...] There are eighty six fondaci in Naples at the present moment; formerly they were still more numerous, but more modern constructions have done away with a good many of them. Three of these fondaci in the Chiaia, S Ferdinando, and S Guiseppe quarters are pretty clean, that is to say in comparison with the others; and as this is only a question of the most ghastly human habitations on the face of the earth I do not include these three Of the eighty three". Axel Munthe, trans. Maude Valérie White, *Letters from a Mourning City* (John Murray, Albemarle Street, 1887), 75-76.

<sup>64</sup> Snowden, *Naples in the Time of Cholera*, 11.

<sup>65</sup> Nelson J. Moe, *The View from Vesuvius: Italian Culture and the Southern Question* (University of California Press, 2002), 62.

<sup>66</sup> "Ich und Mancher mit mir, wir wissen ein andres Lied von Neapel zu singen, und oft hab' ich die Feder angesetzt um bitterböse Feuilletons zu schreiben unter dem Titel 'Riech Neapel und werde ohnmächtig (sic), höre Neapel und werde toll!' Der Lärm auf den Strassen ist ohne gleichen, nicht in der City von London, in der Leipzigerstrasse von Berlin und auf keinem Boulevard von Paris wird das Trommelfell so in Anspruch genommen, wie auf dem Toledo und der Strada di Chiaja von Neapel". Dohrn, "Die Erbauung", 10. Dohrn consistently made bitter remarks regarding the daily circumstances and indigenous "nuisances" in Naples.

<sup>67</sup> See Arnaldo Bruschi, "Edifici privati di Bramante a Roma. Palazzo Castellani e palazzo Caprini", *Palladio* 2 (1989), 5-44.

<sup>68</sup> See Didem Ekici, "Skin, Clothing, and Dwelling", *Journal of the Society of Architectural Historians* 75, no. 3 (September 2016): 281-298.



B. MAIN ENTRANCE TO THE AQUARIUM.

Photograph by Doctor Schöbel.

THE NAPLES ZOOLOGICAL STATION.

on the piano nobile from the shops on the lower (physically *and* socially) level that catered to the dense curial and pilgrim traffic<sup>67</sup>, the building effectually accentuated the social disconnection of the upper-floor multinational scientists from the ground-floor aquarium-goers swarming from the street (the analogy even extended to the architectural language, as both Bramante and Dohrn distinguished the two levels with a rusticated base and orders atop). In view of how nineteenth-century physiological and hygienic theories impinged on both clothing [*Kleidung*] and dwelling [*Wohnung*], where the skin was considered a primary media through which the body moderated the effects of the "atmosphere," this was no surprise<sup>68</sup>.

For Dohrn, the chief impact of epidemics was, again, financial: they led to fewer tourists and in turn reduced aquarium income. Throughout the 1870s and 1880s, in his extensive correspondence with friends and colleagues, he consistently lamented the adverse effect of the endless cholera and typhus recrudescences on travel<sup>69</sup>. He complained that in 1884 alone as cholera wreaked great havoc, the station suffered a "substantial" revenue shortfall of "7,000 fr" in addition to the fishing standstill<sup>70</sup>. But in the meantime, he came to the awareness that considering the latest strides in tropical microbiology for imperialist "use", a mere flip of the script, so to speak, would conjure a newfound source of income: all it took was to bring the artifact itself – the epidemic-breeding meridional milieu – to the forefront; in particular, the "harbor water"<sup>71</sup>. In 1885, writing to German

Empire's State Secretary Karl Heinrich von Boetticher, Dohrn proposed, though unsuccessfully, that the *Kaiserliches Gesundheitsamt* ("Imperial Health Office") in Berlin rent a table at the Naples station for bacteriological pursuits, especially for "research into the types of fever associated with malaria"<sup>72</sup>. He insisted on the "beneficial consequences" of such an establishment for the empire's *coloniale Bestrebungen* ("colonial aspirations"), and Naples, the hectic Mediterranean seaport and hotbed *sui generis* for cholera and other infectious diseases, offered the "most favorable" conditions to develop into Germany's imperial laboratory for tropical medicine investigations<sup>73</sup>.

Dohrn somewhat earlier made the same offer, during the 1884 outbreak, to Robert Koch, who had just avowedly claimed the "discovery" of *Vibrio cholerae* during his etiological expeditions in Egypt and India. Koch, the outspreading German Empire's chief "microbe hunter", was said to have examined a Calcutta tank to confirm water's mediating role in the transmission of cholera through infective human wastes<sup>74</sup>. Having returned victorious in vying to identify cholera's causative agent in the inter-imperial competition against the French, Koch did not believe he could "add anything substantial" to his already advanced research and dismissed the suggestion. Upon Koch's visit to the station in 1887, however, Dohrn finally recruited Koch as an intermediary, who recommended his assistant to set up a bacteriological laboratory at Naples in the following year<sup>75</sup>.

That a station founded for marine biology could so readily pivot toward tropical microbiology – offering its own sewage as resource for colonial science – further reveals the logic that sustained it. In a dense ecology of financing, city growth, and environmental instability, the scientific program it housed did not stand apart from these forces but was shaped by their effects, from the spectacle economy of tourism to, even more profoundly, the accumulation of urban waste deposited into the aqueous field where the study of marine animals in their supposedly natural environment was taking place. Rather than considering collaboration as the deliberate meeting of architectural minds, this paper has traced how a project emerged from more diffuse forms of co-laboring: among scientists and marine animals, seafront property and imperial ambition, public wonder and anthropogenic impact. Especially in the collapse of the laboratory and the theatre, the pursuit of knowledge discloses a material foundation of neither purity nor containment, but of dependence on – and deformation by – the very conditions it sought to master.

<sup>69</sup> Regarding the daily influx of aquarium visitors, Dohrn had pronounced concerns about cholera from day one. On January 12, 1874, he wrote to Carl Friedrich Wilhelm Claus, the Vienna-based zoologist and future head of the Trieste Zoological Station, "The Aquarium has been opened. The participation of the public is mediocre: there are few foreigners here – cholera, money crises, etc., have trimmed their ranks." See Heuss, Anton Dohrn, 157. More broadly on Dohrn's marketing concerns and strategies, see Motta, "The Aquarium and the Globe."

<sup>70</sup> "Die Cholera hat wie allgemein bekannt ist in Neapel große Verheerung angerichtet; ist auch die Zoolog Station nicht von einem Todesfall betroffen worden, so hat sie doch schweren Schaden durch die starken Einnahme Ausfälle des Aquariums gehabt und vermehrten Ausgaben zur Linderung des Nothstandes der Subalternbeamten sich unterziehen müssen. Der Gesamtverlust be ziffert sich im Jahre 1884 auf 7000 fr". Dohrn, "Bericht über die Zoologische Station", 143-144.

<sup>71</sup> Heuss, Anton Dohrn, 268.

<sup>72</sup> Anton Dohrn to Karl Heinrich von Boetticher, October 20, 1885, Archivio Storico della Stazione Zoologica Anton Dohrn.

<sup>73</sup> *Ibid.* See also Müller, *Die Geschichte der Zoologischen Station in Neapel*, 147.

<sup>74</sup> Antonio Carbone, *Epidemic Cities* (Cambridge University Press, 2022); Sheldon Watts, "Cholera and Civilization: Great Britain and India, 1817 to 1920", in *Epidemics and History: Disease, Power and Imperialism* (Yale University Press, 1997), 167-212.

<sup>75</sup> Müller, *Die Geschichte der Zoologischen Station in Neapel*, 148. See also Enrico Ciaranfi, "La Stazione Zoologica e la ricerca biomedica", in *Reinhard Dohrn 1880-1962: Reden, Briefe und Veröffentlichungen zum 100. Geburtstag*, ed. Christiane Groeben (Springer-Verlag, 1983), 18-23 (20).