



STAZIONE ZOOLOGICA ANTON DOHRN

Istituto Nazionale di Biologia, Ecologia e Biotecnologie Marine

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Anton Dohrn

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150 YEARS OF SCIENCE AT THE STAZIONE ZOOLOGICA ANTON DOHRN: VALUING THE PAST TO PLAN THE FUTURE

Darwin Dohrn Museum

06-07 July, 2022

150 Years of Zoological Stations

The Victorian age was signed by the adventurous exploration of the planet, with the objective of producing maps aimed at locating precious resources.

Natural history, and the appreciation of the arts, were fashionable for the upper classes, mostly based at cities located in northern European and American countries, where the diversity of life was much lower than at the tropics.

The Mediterranean Area was in between the biodiversity-poor northern regions, and the biodiversity-rich southern regions. The Mediterranean, furthermore, is the cradle of western civilization, representing the premises of Northern European cultures. Charles Darwin, during his voyage with the *Beagle* (1831-1836), accumulated a wide experience of the “things of nature” and changed our vision of the world with his grand theory of ecology and evolution. After a period of adventures, Darwin “settled down” and spent his life elaborating what he learnt in his youth and what he observed in the vicinities of Down House, his home and working place. At those times the ships like the *Beagle* were ideal exploration tools, and biological oceanography was flourishing. In 1872 the *Challenger* expedition tested the hypothesis that life could reach the deepest abyss, dominated by eternal darkness. The Expedition led to the discovery of more than 4.000 species. In the very same year, Anton Dohrn opened the season of marine biology, envisaging the counterpart of oceanographic vessels: marine stations.

Ships have a wide operational range, moving across the vastity of the ocean, whereas marine stations take advantage of well established facilities that allow for long term and accurate studies of the biology and ecology of marine life.

Dohrn’s project was simple and direct. Half of his facility was dedicated to the exploration of the fauna and flora of the Gulf of Naples, the other half was dedicated to studies aimed at elucidating the mysteries of life, from the development of complex organisms (embryology) to the structure and function of their body systems. Each problem was tackled with experiments on model animals that were not reared in the laboratory, but were collected daily by the scientific fisheries department. The word biodiversity had not been coined yet, but the monographs on the *Fauna and Flora of the Gulf of Naples* posed the pillars of the modern



*Anton Dohrn in a
drawing by Johannes
Martini, 1898.
(Historical Archives,
Stazione Zoologica
Anton Dohrn)*

knowledge of marine biodiversity. Salvatore Lo Bianco published monographs on the periods of sexual maturity of the animals of the gulf, setting the baselines for their phenology, while assembling catalogues that allowed scientists to plan their studies at the Stazione, according to the availability of their experimental animals. The advent of model animals, none of which marine, lessened the attractiveness of marine stations for experimental biologists, with few outstanding exceptions. The advent of satellites and automated tools for the measurement of some relevant variables, further contributed to the crisis of marine stations.

After 150 years, however, the winds have changed. The paramount importance of biodiversity and ecosystems for the ecological transition calls for the knowledge of the “fauna and flora” of our seas, and the impact of global warming calls for the appreciation of phenology changes. The knowledge accumulated at marine stations is the benchmark that allows the appreciation of the ongoing changes, and sets the standards for the outcomes of environmental restoration. Biodiversity, furthermore, offers a prodigious variety of biological structures and functions that cannot be accounted for by the small number of model species currently under investigation. Marine stations, after a period of crisis due to the success of experimental biology with model species and of the automated exploration of the sea with modern technologies, are now in the forefront, with the aid of next generation equipment to solve old problems that have never been solved and that are of the utmost urgency.

The Stazione Zoologica Anton Dohrn has acquired the critical mass of a modern institution with a very long tradition, pre-adapted to face the challenges of the future with a virtuous blend of traditional and innovative approaches.

The study of biodiversity must be conducive to the disentangling of ecosystem functioning, while investigating the fine functions of living matter, with a continuum of approaches ranging from molecular biology to ecology and evolutionary biology. The strength of the Zoological Station is that these studies take place under the same roof with the aim of assembling a suite of reductionistic approaches into a single, grand holistic vision, while pursuing the very same pro-



*Villa Dohrn, Ischia,
painting by Sibilla von
Haeften, 1933.*



ject that inspired Anton Dohrn. The exploration of biodiversity is far from being accomplished, the deep sea is still largely unknown, the consequences of our actions call for remedies that must be based on solid knowledge. The extraction of resources from the seas and the world ocean must be sustainable and the role of research institutions such as the Zoological Station is ideal to take the most crucial enterprise for our species: to keep being prosperous while not compromising the premises of our prosperity.

STAZIONE ZOOLOGICA ANTON DOHRN DARWIN-DOHRN MUSEUM

Wednesday July 6, 2022

9.30 - 10.00

REGISTRATION

10.00-11.20

Welcome and Opening Remarks

President of the Stazione Zoologica Anton Dohrn

Roberto Danovaro

Mayor of Naples

Gaetano Manfredi

President Accademia Nazionale delle Scienze detta dei XL

Corrado De Concini

Rector of the University of Naples "Federico II"

Matteo Lorito

Accademia Nazionale delle Scienze detta dei XL

Annibale Mottana

Dohrn Family representative

Edith Finlay

SESSION 1

From "Zoologische Station" to "Stazione Zoologica Anton Dohrn - Istituto Nazionale di Biologia, Ecologia e Biotecnologie Marine"

Chair Ariane Dröscher

11.20 - 11.40

"Great aims seem foolish at the outset": Anton Dohrn and the foundation of the Zoological Station

Christiane Groeben, Stazione Zoologica Anton Dohrn

11.40 - 12.00

Dohrn and Darwin: a dialogue towards the future

Telmo Pievani, Padova University

12.00-12.20

Anton Dohrn – manager of science ante litteram

Domenico De Masi, Rome

12.20-12.40

The Stazione Zoologica di Napoli between the 1940s and 1970s: from international center to international niche

Fabio De Sio & Heiner Fangerau, Düsseldorf University

12.40-13.00

Rupert Riedl, the Gulf of Naples and the Stazione Zoologica - a long lasting relationship

Jörg Ott, Vienna

13.00 - 14.20

LUNCH

SESSION 2

“Freedom for research”: the scientific community at the SZN

Chair Alessandro Minelli

14.20 - 14.40

‘Scientific Fishery’ in the Gulf of Naples: The Zoological Station and its Research Program 1873-1913

Katharina Steiner, University of Geneva

14.40 - 15.00

The young women and the sea: the first generation of female guest investigators at the Stazione Zoologica

Ariane Dröscher, Bologna University

15.00 - 15.20

Hospitality and community: the Naples Experience

Christiane Groeben, Stazione Zoologica Anton Dohrn

15.20 - 15.40

The Two Rooms of Anton Dohrn’s Dream: The Beauty of Art and Science at the Naples Zoological Station

Bernardino Fantini, University of Geneva

15.40 - 16.20

COFFEE BREAK

SESSION 3

Lessons learned in the last 150 years of marine research

Chair Christiane Groeben

16.20 - 16.40

150 years of zoological researches at the SZN - Sounding the disparity of marine life

Alessandro Minelli, Padova University

16.40 - 17.00

Valuing marine stations in Europe and beyond

Matthew Frost, MARS

17.00 - 17.20

Past and Present of Deep-Sea Research

Roberto Danovaro, Stazione Zoologica Anton Dohrn

19.00 - 20.00

CONCERT AT THE DADOM AND COCKTAIL ON THE TERRACE

STAZIONE ZOOLOGICA ANTON DOHRN DARWIN-DOHRN MUSEUM

Thursday July 07, 2022

9.30 - 10.00

SESSION 4
Roads to the Future
Chair **Ferdinando Boero**

09.00 - 09.20

On the variety, roles and importance of marine stations for the science of the future
Tim Hunt – *via Zoom*

09.20 - 09.40

Realizing Anton Dohrn's dream: The European Marine Biological Resource Centre (EMBRC)
Wiebe Kooistra, *Stazione Zoologica Anton Dohrn*

09.40 - 10.00

The potential of the marine biotechnologies
Roberto Bassi, *Accademia Lincei*

10.00 - 10.20

On plankton, whales, seabirds ... research mysteries at low and high Reynold's numbers
Frédéric Briand, *Mediterranean Science Commission, CIESM*

10.20 - 10.40

From the Fauna and Flora monographs to Lo Bianco's Phenology, to Biodiversity and Ecosystem Functioning: the old visions become avant-garde
Ferdinando Boero, *Federico II University*

11.00 - 11.30

Ambassador **Christiane Groeben**
Closing Remarks



ASZN, La 121.40.
Anton Dohrn in his study, in a photograph by Wilhelm Giesbrecht taken in November, 1889. On the left: a wall shelf entirely occupied by wooden boxes containing microscopy slides.



LIST OF SPEAKERS



Roberto Bassi is full professor of Plant Physiology at the University of Verona, Italy. Previously, he has been professor in Marseille (Fr) and assistant professor in Padua, Kopenhagen, Paris and Geneva. His research deals with the light reaction of photosynthesis, the structure and function of the proteins harvesting light for photosynthesis. Applied research focus on improving the productivity and environmental stress resistance of plant and algae for the production of food and fuels. He is member of the National Academy of Sciences (Accademia dei Lincei), EMBO, the European Academy and others. He has published 270 research articles and his H-factor is 97.

studies, making available the benchmarks modern conditions must be matched with, also providing solid baselines for future studies.



Frédéric Briand, born in Paris, studied marine ecology (Ph.D.) at the Univ. of California. Early research on Atlantic and north Pacific shores. Discoverer of invariants in the architecture of global foodwebs. Noted papers on the cybernetics of complex ecological systems. Head of Mediterranean Science Commission. Whaling Commissioner; leading advocate of UN control over all migratory species in the High seas.



Ferdinando Boero, Chair of the Stazione Zoologica Anton Dohrn. President of the Dohrn Foundation. Author of hundreds of essays on: Marine Biodiversity and Ecosystem Functioning, Evolution, Sustainability. He has conceived the exhibit of the Darwin Dohrn Museum. Main honors: Grand Médaille Albert 1er of the Institut Océanographique de Paris. Medal of the National Academy of Sciences for Physical and Natural Sciences. From the Fauna and Flora monographs to Lo Bianco's Penology, to biodiversity and ecosystem functioning: the old visions become avant-garde. Biodiversity and ecosystem functioning are the pillars of the ecological transition, their state measures the efficacy of sustainability initiatives. The Zoological Station documented the state of biodiversity in the Gulf of Naples with monographs and specific



Roberto Danovaro, President of the Stazione Zoologica Anton Dohrn, Naples, Italy. Past-president of the Italian Society of Ecology, of the Italian Society of Limnology and Oceanography and of the European Federation of Scientific Societies. President of the Scientific Council of WWF Italy. Member of several international panels (IUCN, UNEP). Member of the EU Academy of Science and of the Academia Europaea (London). Coordinator of several EU and international projects. RD is Author of ca 450 international papers, and of 3 books. He received the Prize BMC Biology (London, 2010), the Award of French Society of Oceanography (2011), and the ENI Award "Protection of the Environment" (2013). In 2020 has been recognized by ExpertScape

as the most influential World Scientist in the Category “Ocean and Seas for the decade 2010-2020”.



Domenico De Masi, was born in Molise, and raised in Campania and Umbria. His career has mostly been focused on teaching and research.

He travelled much, but the most important cities for his work have been Milan, Sassari, Naples and Rome. In Brazil, where he holds an honorary citizenship in Rio de Janeiro, he has held conferences in almost all the main cities of the country. He has held conferences in almost all the main cities including Rio de Janeiro where he holds honorary citizenship. His biography is divided by paragraphs relating to different life segments: family and research; domains of activity; the Neapolitan, Milanese and Roman periods; teaching in Sassari, Naples and Rome; the founding of his school and then of S3Studium company; other professional and civilian commitments; trips to Brazil and many other countries worldwide as well as received acknowledgements.



Fabio De Sio, is wissenschaftlicher Mitarbeiter in the Institut für Geschichte, Theorie und Ethik der Medizin, Heinrich Heine Universität Düsseldorf. His research

focuses are the history of neurophysiology and neuroscience, and the history and ethics of experimental research on invertebrates.



Ariane Dröschler is currently research fellow of History of science at the Dep. of Biology in Florence. She has graduated at the University of Hamburg and taught at several Italian universities. She has published 5 monographs, 2 editions and more than 120 essays, and is vice-president of the *Deutsche Gesellschaft für Geschichte und Theorie der Biologie* and member of several editorial boards.



Bernardino Fantini, is Honorary Professor of History of Medicine and Health, Faculty of Medicine, University of Geneva. After a PhD in biochemistry in Rome in 1974, he has got a PhD in History and Philosophy of Life Sciences at the EPHE-Sorbonne, Paris, in 1992. Full Professor of the History of Medicine and Health at the University of Geneva from 1992 to 2013. He is Past president of the European Association for the History of Medicine and Health and a corresponding member of the Académie Internationale d'histoire des sciences (International Academy for the History of Science). His main research interests are: history of genetics and molecular biology, Philosophy of the Life Sciences, History of epidemics; history of the relationships between music and science and the emotional power of music. At the SZN, under the presidency of Alberto Monroy and Gaetano Salvatore, he was Associate Editor of the journal



Matthew Frost has many years working at a high level in strategic development and national and international policy. Matt works extensively on international matters specialising in networking and science diplomacy and sits on a number of national and international committees related to marine policy and coordination. He chairs the UK's primary marine climate advice body (the Marine Climate Change Impacts Partnership) as well as its Overseas Working Group and led work with the UK Overseas Territory governments to produce the first-ever climate assessment across all the UK Overseas Territories. As President of the European Network of Marine Stations (MARS) he also led on the establishment of the World Association of Marine Stations (WAMS), working with global partners to bring together marine station directors (with UN IOC-Unesco) in support of the Sustainable Development Goals Originally trained as a marine biologist, I am also a trained commercial diver and have published over 160 journal papers, book chapters, reports, and articles as well as giving over 100 invited conference talks.



Christiane Groeben, philologist, archivist and historian of science. Born in Germany, she studied Germanic and Romance philology

in Heidelberg, Freiburg, Tübingen, Lausanne and Naples. From 1969 to 2010 she is responsible for the formation and administration of the Archivio Storico della Zoologica Anton Dohrn. She collaborated with the journal *History and Philosophy of the Life Sciences* since 1985 in quality of Book Review Editor and since 1995 as Managing Editor. Through exhibitions and conferences, she has also contributed to spreading the awareness of the unique role that the Zoological Station has had in spreading the knowledge of life at sea to the story of the Zoological Station and to its founder Anton Dohrn. The interest of her research continues to be focused on the enhancement of the scientific-cultural heritage of the Anton Dohrn Zoological Station and of the people who contributed to creating this heritage.



Tim Hunt was, until his retirement in 2010, a ‘Principal Scientist’ (note, not THE principal scientist) at Cancer Research UK, Clare Hall Laboratories, in South Mimms, Hertfordshire. Tim was born in 1943 and grew up in Oxford, moving to Cambridge to read Natural Sciences in 1961. He obtained his Ph.D. (“The Synthesis of Haemoglobin”) from the Department of Biochemistry in Cambridge in 1968, and spent almost 30 years in Cambridge, working in the Department of Biochemistry, at first on the control of protein synthesis in red blood cells, sea urchin eggs and clam oocytes and from about 1983 onwards on the control of the cell cycle. He worked in the USA as a postdoctoral Fellow with Irving M. London at the Albert Einstein College of Medicine from 1968-70 and spent summers at the Marine Biological Laboratory, Woods Hole from 1977 until 1985, teaching laboratory courses and doing research. In July 1982, he discovered cyclins, which turned out to be components of “Key Regulator(s) of the Cell Cycle”. This led to a share of the Nobel Prize in Physiology or Medicine in 2001, together with Lee Hartwell and Paul Nurse. Tim was chairman of the council of EMBO (European Molecular Biology Organization) from 2006 - 2010. From 2011 to 2015, he was a member of the Scientific Council of the Europe-

an Research Council (ERC). Tim has been helping to compose problems for Molecular Biology of the Cell by Alberts et al. since 1985, and The Problems Book ran to 5 editions and will soon go online to accompany the 7th Edition of Alberts et al. Tim has never held the title of “Professor”.



Wiebe Kooistra studied at Groningen University (NL) and got his PhD in 1993. Following research fellowships at the AWI and STRI, he was appointed at the SZN in 2000 where his research focuses on phycozoology. He has fostered cooperation of marine stations across Europe ever since, and has been a founding member of EMBRC. His decision to pursue a career in phycozoology happened during a immersive course at SBR.



Alessandro Minelli, Member of the Accademia Nazionale dei XL, former professor of Zoology at the University of Padova. Following years of research in biological systematics and biodiversity, is currently active in evolutionary developmental biology. Author of *Biological Systematics, The Development of Animal Form, Perspectives in Animal Phylogeny and Evolution, Plant Evolutionary Developmental Biology, Understanding Development*.



Jörg Ott, 1969 Ph.D. Zoology and Botany, University of Vienna
1969 – 1971 Postdoctoral research at UNC Chapel Hill, USA
1971 – 1992 Assistant Professor, University of Vienna
1982 Venia Docendi (Habilitation) University of Vienna
1985-1986 Visiting Researcher at the Institute for Marine Sciences and Visiting Associate Professor at the Department of Biology, University of California at Santa Cruz, USA.
1992- 2007 Associate Professor, University of Vienna
2004- 2007 Head of the Department of Marine Biology, Faculty of Life Sciences, University of Vienna
2007 Retired, Leader of the research group “Shallow water symbioses” at the Department of Marine Biology (now Department of Limnology and Bio-Oceanography), University of Vienna



Dietelmo Pievani, is Full Professor at the Department of Biology, University of Padua, where he covers the first Italian chair of Philosophy of Biological Sciences since 2015. After Ph.D. researches in USA, he has been Professor of Philosophy of Science at the University of Milan Bicocca (2001-2012). Past President (2017-2019) of the Italian Society of Evolutionary Biology, he is Fellow of several academic Institutions and scientific societies. He is member of the editorial boards of *Evolution: Education and Outreach*, *Evolutionary Biology*, *Rendiconti Lincei Sc. Fis. Nat.*, *Nature Italy*, *Istituto*

Treccani, and the Italian edition of *Scientific American*. He is author of 302 publications, included several books: “Introduction to Philosophy of Biology” (Laterza, 2005); “The Theory of Evolution” (Il Mulino, 2010); “Born to Believe” (Codice Edizioni, 2008, with V. Girotto and G. Vallortigara); “The Unexpected Life” (Cortina Editore, 2011); “Homo sapiens. The Great History of Human Diversity” (Codice Edizioni, 2011, with L.L. Cavalli Sforza), “Introduction to Darwin” (Laterza, 2012); “The End of the World” (Il Mulino, 2012); “Freedom of migration” (Einaudi, 2016, with V. Calzolaio); “How we will be” (Codice Edizioni, 2016, with L. De Biase); “Imperfection. A natural history” (Cortina, 2019, MIT Press, 2022); “The Earth after us” (Contrasto, 2019; with F. Lanting’s photos), “Finitude” (Cortina, 2020); “Serendipity” (Cortina, 2021). Fellow of the Scientific Board of science festivals in Italy, since 2014 he is fellow of the International Scientific Council of MUSE in Trento. He is Director of “Pikaia”, the Italian website dedicated to evolution (www.pikaia.eu). He is Director of the University of Padua web magazine, *Il Bo LIVE* (<https://ilbo.live.unipd.it>). With Niles Eldredge, Ian Tattersall and Luigi Luca Cavalli-Sforza, he curated International science exhibitions. Author of books for children and theatre scientific shows, he collaborates with RAI radio and TV projects, he is a columnist for *Il Corriere della Sera*, and the magazines *Le Scienze* and *Micro-mega*. Personal website: www.telmopievani.com

manuscript entitled *Visualizing Marine Biology: Copepods, Fishermen, and the Naples Zoological Station*.



Katharina Steiner, is a postdoctoral researcher at the University of Geneva. Her research focuses on the history of marine biology with an emphasis on zoology, the history of labour and work culture, and on the intersection of scientific and popular visual cultures. Her research has been funded by the Marie Skłodowska Curie-Actions (Horizon 2020) and by the Swiss National Science Foundation. She has published in the fields of the history of photography and biology. She is currently finishing her book



Dohrn’s embryological collection now in the Museum für Naturkunde Berlin.
Photo sent by scientific manager, Christiane Groeben.

Institut International d'Embryologie

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CATALOGUE

des préparations de Sélaciens de feu

= le Prof. A. DOHRN =

N° 1 des Inventaires

UTRECHT 1913



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