

Sustainability of Marine Biological Stations, lessons from a historical perspective

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Scientia potentia est (knowledge is power) and when governments became aware of the implications of the aphorism the sea became both a medium of transportation to investigate new territories and a depository of resources. The most important trip in Biology, and possibly in other ambits of humanism, was that of the HMS-Beagle, an exploration of the biodiversity of the planet on board of a vessel of the Royal Navy. Soon marine biodiversity became key to understand the origins and evolution of living organisms, and there was an urgent need for easy access to marine biological resources. Then, marine biological stations (MBS) began to sprout, first in Europe and then in USA and other countries, mostly due to the efforts of single scientists or that of reduced groups of people. In many circumstances, marine stations were shelters providing visiting researchers access to the marine coastal bioresources during their teaching summer holidays. In all cases, they became centers allowing consolidating the three pillars of Biology; the evolution, the cell and the heredity theories. Scientific/technological advance found their opportunity in MBS with good biological specimens, model organisms, at hand. Mere descriptive taxonomy became comparative in the light of evolution theory and moved forward through microscopy, comparative anatomy/morphology and comparative embryology. Then research on marine biota became more physiological, to finally drive into the application of biochemical and molecular biology approaches, as perfectly reflected in the work of the Nobel prize winners working as visitors in marine stations. MBS also catalyzed genetic research during the rediscovery of Mendelian laws in the first quarter of the 20th century. Cellular processes became focus of research, and for instance a lot of our knowledge on fertilization stems from research on marine coastal organisms accessed in MBS. Now, organizations such as OECD or institutions such as the European Commission are discovering the power of Marine Biotechnology in the development of new products (pharmaceuticals, nutraceuticals, cosmetics, industrial products...) towards a cohesive economic growth worldwide. Much of such biotechnological knowledge is stemming from MBS.

Since P.J. Van Beneden opened the first marine station in Ostend 175 years ago, or in the 145 years of life of the oldest living ones in Roscoff and Naples, MBS have shown capacity to adapt to the changes in scientific-mainstreams, when not being the vanguard in such changes. In the era of "multiomics" and the "open-science-cloud" marine stations are still alive showing through their history adaptability and resilience. It is for this reason that, in times in which some institutions are facing strong cuts and even some are being closed, MBS need to learn from their history to take lessons into their future sustainability. Organization into a pan-European research infrastructure such as EMBRC-ERIC has been the move towards consolidation and progress for some of these stations, and within its long term sustainability assessment EMBRC-ERIC is writing the history of MBS as a coffee table book that should be published in 2019.

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