

Title: The oceanographic instruments collection of Prince Albert I of Monaco and King Carlos I of Portugal: a case study in scientific photography

Authors: M.E. Jardim<sup>a</sup>, I. M. Peres<sup>b</sup>, F. M. Costa<sup>b</sup>

Institution: <sup>a</sup> Depart. of Chemistry and Biochemistry, Faculty of Sciences, University of Lisbon, Ed. C8, 1749-016 Lisboa, Portugal

<sup>b</sup>Centre for Molecular Sciences and Materials of the University of Lisbon, Ed. C8, 1749-016 Lisboa, Portugal

Email: [mejardim@fc.ul.pt](mailto:mejardim@fc.ul.pt)

In the second half of the 19th century, as the most advanced nations felt the need for the installation of submarine telegraphic communications, knowing the bathymetric and topographic charts of the oceans, became imperative. Several scientific instruments such as the Brooke sounder, introduced in 1852 by John Brooke and the Negretti & Zambra reversing thermometer to obtain the temperature of the sea at several depths, were invented at that time. It was, however, after the famous Challenger Expedition's observations in marine physical and biological sciences from 1872-1876, that other nations were encouraged to take interest in oceanographic research and to organize their own expeditions.

Since 1885, Prince Albert I (1889-1922) of Monaco conducted oceanographic campaigns (1885-1915), publishing the accounts of these scientific results in the "*Résultats des campagnes scientifiques accomplies sur son yacht par Albert Ier, prince souverain de Monaco*" and in several articles and books. He had the collaboration of some of the best scientists in marine biology and physics oceanography (Pouchet, Regnard, Richard and Buchanan). Numerous oceanographic studies, maps and charts were recorded. Many techniques and instruments were also devised for this oceanographic work. In his first campaign to the islands of Azores he and his team discovered fifteen new species living in low-sea conditions near the shore. The intense scientific activity of Prince Albert, to whom he had a close association, certainly contributed to stimulate the interest of King Carlos I (1863-1908) of Portugal for the study of the oceans, its cartography and marine species. Although some oceanographic work had already been done off the coast of Portugal by the Challenger in 1873 and the prince of Monaco in 1894, King Carlos felt the need for a methodical study of the distribution and habitat of fishes, research on new marine species as well as the construction of bathymetric charts. He engaged the collaboration of a fine naturalist Albert Girard in all his expeditions (1896 - 1906). The general results of his campaigns were published in two works. Two scientific publications were also written by King Carlos, one on Algarve tuna (1899) and another on sharks (1904).

The two monarchs exchanged information concerning the instruments and methods used in their oceanographic work which is well shown in an abundant correspondence between King Carlos and Prince Albert during the years 1894 -1907. They both shared the need to use photography to document and further their research. King Carlos took the first photomicrographs of plankton done in Portugal and probably in the world, and in several expeditions organized by Prince Albert, photography was used in physical oceanographic determinations as well as in the anatomical studies of marine species (photomicrographs). The collections, instruments and biological species, the result of their oceanographic expeditions, were presented in several national and international

exhibitions, thus contributing to the public awareness of marine life and conservation problems

In this paper we will analyse how these two instrument collections reflect the contribution to the development of oceanography given by both monarchs and their scientific teams, focusing mainly on its photographic instruments, methods and iconography.