A Prince's Tribute...and Trial

Monaco's Prince Albert II followed the footsteps of his great great grandfather when he ventured to the Arctic Archipelago to track climate change, this time with IAEA Marine scientists.

Known as the Father of Oceanography, Monaco's Prince Albert I first explored Svalbard Island, in the Arctic Archipelago, in the early part of the last century. His team of scientists studied glaciers, mapped previously unknown areas of Svalbard and carried out other scientific research. Their findings are still regarded as a valuable contribution to oceanography by today's scientists.

One hundred years later, as a tribute to his great great grandfather's noble and courageous undertaking, Prince Albert II charted a similar journey — one that would take him from the Russian Base of Borneo to the North Pole, approximately 100 kilometres away — and hopefully add to the scientific body of work started by his ancestor. Just as important, Prince Albert undertook this trip to draw global attention to the environmental damage to the Arctic regions caused by global warming.

Speaking at a news conference in Monaco before the trip in April 2006, the Prince explained his hopes: "If, in our modest way, by this action we are able to bring environmental problems to the forefront and force some leaders to take stronger actions, this expedition will have achieved its objectives."

Secrets from the Watery Depths

Prince Albert was accompanied on his expedition by marine scientists and other experts in his week-long journey aboard the vessel, *Origo,* before starting his journey via sled-dogs to the North Pole. To collaborate on the scientific chapter of his expedition, Prince Albert invited two experts—Dr. Samantha Smith, Director of the World Wildlife Fund polar programmes and Mr. Roberto Cassi, an IAEA scientist working at the Agency's Marine Environment Laboratory in Monaco. Both advised the Prince and other team members about the Arctic's natural values and the environmental challenges now facing the region, in particular climate change.

Although far away from industrialized areas, Svalbard Island is eminently suitable to observe the evolution of climate change and long-range pollutants transported from

northern European countries by water currents and from North America by winds. Using nuclear techniques, it is hoped that some of the causes of climate change can be unlocked. Mr. Cassi focused his work on two projects: mollusc shells as biological artefacts and biomonitoring of pollutants in zooplankton.

The first of these studies was undertaken to evaluate the shell laminations of a very long-lived marine bivalve mollusc, the Ocean Quahog. The mollusc, with a life expectancy well over a century, acts as a recording of temperature variations and water chemistry. Day after day, it absorbs and retains heavy metals and temperature marks in the nacreous layers of its shell. The shells serve as an "archive" of long-range contaminants and changes in the sea surface, in a similar way to tree rings which bear witness to environmental change.

An analysis of the collected shells may enable scientists to construct, with very detailed precision, the history of pollution brought by the winds and currents, as well as the evolution of sea temperature. The same species of mollusc was collected in Norwegian waters by Prince Albert I in the early 1900s and housed in the Oceanographic Museum in Monaco. A comparison of the two sets of specimens potentially could be a key to unlocking a century of climate change.

The second project aimed at determining levels of contaminates in marine zooplankton in remote arctic environments for comparison with other climatic regions.

Problems and Predictions

Prince Albert is a keen environmentalist and sportsman but his trip to the Arctic was no 'day at the beach'. The Prince and his crew faced frigid and hostile conditions on their nine-day-trip in April this year. Alaskan Husky dogs manoeuvred the expedition team around ice cracks and pack-ice (blocks of ice) which hampered their progress. Two members of the team were thrown from their sleds into the sub-zero Arctic waters when the dogs pulled the sled into large block ice while crossing the open water. All survived the ordeal but more days of harsh conditions loomed for the team when weather conditions worsened, giving way to poor visibility, violent winds and rough icy terrain.

After days of unceasing efforts, Prince Albert and the members of the expedition team reached the North Pole. However, the real work of the trip is just beginning as scientists continue to probe the Arctic clues to answer lingering questions and predict where the environment is heading.

—Linda Lodding, IAEA Staff Report

Photos: Top—The Ocean Quahog mollusc acts as a recording of temperature variations and water chemistry.

Middle—Roberto Cassi and Prince Albert dissect Arctic molluscs on board "Origo".

Bottom—IAEA scientist Roberto Cassi, who was on board the "Origo" to study the effects of global warming on mollusc shells and zooplankton, inspects the nets.

Photos: Palais Princier de Monaco and the IAEA Marine Environment Laboratory, Monaco.

MONACO & Marine Environmental Protection

by Prince Albert II of Monaco

We all know the importance of the protection of the marine environment for sustainable development and economy of coastal countries, like Monaco. Sadly, this environment has been under continuous threats from development, tourism, urbanisation and demographic pressure. The semi-enclosed Mediterranean sea is challenged by new pollutant cocktails, problems of fresh water management, over-fishing, and now increasingly climate change impacts.

Monaco has a long history in the investigation of the marine environment. Prince Albert I, was one of the pioneers in oceanographic exploration, organizer of European oceanographic research and founder of several international organizations including the Musée Océanographique.

We are very proud that the International Atomic Energy Agency established in 1961 its Marine Environment Laboratory in Monaco, the only marine laboratory in the United Nations system. More than 40 years ago the IAEA joined forces with the Grimaldi family and several interested governments to establish the Marine Environment Laboratory in Monaco. Their first purpose-built facilities, dedicated to marine research, launched a new era in the investigation of the marine environment using radioactive and stable isotopes as tracers for better understanding of processes in the oceans and seas, addressing their pollution and promoting wide international cooperation. We are pleased that the Government of the Principality of Monaco has been actively engaged in these developments and is continuously supporting activities of the Monaco Laboratory.

The Centenary of Prince Albert I's Arctic Expeditions was recently celebrated by retracing part of this expedition in the vicinity of Svalbard Island before completing a trip to the North Pole by dog sled. This expedition to Svalbard also provided opportunities for scientific organisations based in Monaco, including the IAEA Marine Environment Laboratory, to undertake research in a relatively remote location and in the sensitive Arctic environment. I was pleased to support and work with scientists from the IAEA Marine Environment Laboratory on projects related to the evolution over time of climate change and the transport of long-range pollutants.

We are very proud that the IAEA established its Marine Environment Laboratory in Monaco, the only marine laboratory in the United Nations system.

Prince Albert launched a new foundation in June 2006 for protection of the environment.

My continuous contribution in these research projects and expeditions convinced me that it is absolutely necessary and urgent to change mankind's mentality towards our planet. As for me, I will do my best through initiatives and projects initiated by the foundation I created to be part of one of the biggest challenges of the 21st century.

For more information about Prince Albert's foundation, contact the Palais Princier in Monaco.
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