

EL NIÑO EN LAS ISLAS GALAPAGOS: EL EVENTO DE 1982-83 THE 1982-83 EL NIÑO EVENT IN THE GALAPAGOS ISLANDS

Edited by Gary Robinson & Eugénia del Pino

Published, Quito, 1985 by the Charles Darwin Foundation. Softback, XXIV + 534pp.
30 articles, 14 in Spanish, 16 in English

Available from Fundación Charles Darwin Casilla 3891, Quito, Ecuador.
US\$12.00 plus postage

In reading this book I have enjoyed the reports and learned much from the scientific studies. But above all I have been deeply impressed by what the book represents beyond the cold academic explanations. When you read it, consider that you are enjoying the privilege of experiencing the reality of Galapagos. This is the joint work of authors from different continents speaking different languages; of renowned scientists and college students; of nature lovers and, especially, of people of Galapagos: men and women who, while knowing their own land, have only now begun to discover the reasons why all the world has fallen in love with their islands.

The volume's 580 pages include articles on climatology, oceanography, marine and terrestrial biology, as well as on socio-economic aspects of the human population. Edited by Eugénia del Pino (Ecuador) and Gary Robinson (USA), it brings together 30 articles by 56 authors, half of them in Spanish, half in English. The editors deserve special gratitude, not only for the quality of the volume but also for the way in which they have overcome the problems of bringing together writers from Galapagos, Guayaquil, Quito, Hawaii, United States, Israel, Switzerland, Denmark, Great Britain and Germany.

The book is divided into five sections. The first consists of six articles on oceanography and climatology, beginning with an historical account of the influence of El Niño on the climate of Ecuador by Plutarco Naranjo, member of the Darwin Foundation's Council. Klaus Wyrski, a world authority on El Niño, describes its development right across the Pacific. Stanley Hayes follows with an analysis of the variation of the temperature and level of the ocean in the archipelago, while Marco Robalino summarises the meteorological data registered at the Darwin Station and compares them with previous averages. Jane Kogelschatz and colleagues from Duke University and the National Institute of Fisheries present evidence of the variations in the production of nutrients which had such a profound influence on the marine ecosystem of the Galapagos; Gene Feldman carries this further by studying the effect on the seabirds and marine mammals.

The second section consists of a single article by Godfrey Merlen, a naturalist guide, who lived through the event and records his personal experiences and observations. He epitomises the ordeals of Galapagos residents when he writes: "It became necessary to be absolutely *interested* in the rainfall and its effects in order not to despair after sweeping the water from our floor for the nth time. I found ... a fascination in following the idea of the limits of mental and physical tolerance. Galapagos has always been a land of harsh subsistence. The low rainfall has perhaps saved the islands from being over-exploited. Even today in some years it is obligatory to transport brackish water to the farms in the highlands for the survival of the cattle. Yet, with the arrival of the rains, we found just the opposite. The thin topsoil was removed. The cattle stood on small hillocks whilst all around the swirling waters busied themselves with gravity's force, taking with them the very essence of the vegetation's future. How cold are the poles, how hot the deserts, how wet the oceans. What a very small habitat is left to man! How much he needs to care for it."

The third section consists of 10 articles dealing with the changes in marine life and the communities that are dependent on it. The co-editor, Gary Robinson (Santa Barbara City College, California) reports on the mortality of different types of coral, barnacles, sea urchins and other invertebrates. He also mentions the presence of species of fish not previously recorded and the absence of common or endemic species, a theme which is further developed by Jack Grove (Los Angeles County Museum). Andrew Laurie of Cambridge University documents the heavy mortality of the marine iguanas and their problems of reproduction. Dominique Limberger (Max-Planck Institute) explains the effects of El Niño on the fur seals and other species. Catherine Rechten (Max-Planck Institute), who studied the nesting of the albatrosses, concluded that not a single chick hatched. Cecilia Hernandez and Tjitte de Vries (Catholic University of Quito) report the reduced number of pairs of Great Frigatebirds, while Carlos Valle (CDRS) records the collapse of the seabird populations in 1982-83, followed by clear signs of recovery in

January 1984. Felipe & Justine Cruz (CDRS) tell of the success of their campaign to save the Hawaiian Petrels by protecting a breeding colony from the rats, a success that would have been greater but for the deluges which killed some chicks. Arnaldo Tupiza (CDRS) gives a succinct account of the effects of El Niño on the wildlife of the Cemetery Lagoon and the floods at Puerto Villamil, Isabela. He wonders whether it would not have been better to continue the traditional practice of building the houses on stilts. Finally, Ana Maria Sosa (Catholic University of Quito) reports on the reduced numbers of seabirds on the Quinta Playa ponds. The whole of this section shows how marine life and all the organisms dependent on it were disastrously affected.

The fourth section, consisting of eight articles on the effects of terrestrial species, seems to be in contradiction with the third because the botanists Hamann, Luong, Toro, Weber and Beck all agree that, with rare exceptions, the flora flourished. Inconspicuous or unknown plants grew exuberantly, spread out and apparently colonized new areas, perhaps other islands. Ole Hamann writes: "When water was no longer a limiting factor for plant growth, a great number of species were able not only to germinate and grow but also to flower and fruit abundantly both in arid and humid vegetation types. Such species may be said to have reacted positively to the Niño conditions." He adds: "Observations during the next few years will reveal whether new species have been added to the flora but until then it appears that the Niño did not cause a change in the general composition of the vegetation types. However it did change the relative importance of the component species in some places."

As with the plants, most terrestrial animals also benefited from El Niño. Linda Cayot, Friedeman & Heide Köster, Peter & Barbara Grant, Robert Curry and Yael Lubin document such successes in their articles on giant tortoises, finches, mockingbirds and fire ants. Although the expansion of the ants can be regarded as a positive achievement for that species, it had a negative effect on the native invertebrates and brought no joy to the human population.

The fifth section of the book deals with the effects of El Niño on man, a noteworthy achievement of authors and editors. Don Eliecer Cruz, an old settler on Floreana, tells of the trials endured by a Galapagos farmer. Students of the Galapagos National College report the damage to the road across Santa Cruz, to the soil on the farms and to the vegetation, as well as discussing the problems of agriculture, cattle raising, fishing, fire ants and human health. Eugénia del Pino, joint editor, devotes the final article of the book to her visit to Galapagos as El Niño was ending in August 1983. Like so many of us, she found it difficult to believe that what she was seeing was real: a different Galapagos with rivers and gorges, culverts and bridges, with exuberant vegetation on all sides but with sadly reduced populations of seabirds and marine animals.

I have deliberately left to the last my comments on the article by Jacinto Gordillo and the introduction by Peter Kramer, former President of the Darwin Foundation and now the Director of Conservation of the World Wildlife Fund International. Gordillo urges greater respect for nature and describes how public works, which did not take sufficient account of the conditions of Galapagos, particularly the diversion of the natural flow of water by large concrete structures, led to the destruction of the newly inaugurated children's playground and serious flooding in the town of Puerto Baquerizo. "Could there be a clearer natural history lesson for architects, engineers, town planners, or even for the inhabitants of Galapagos?"

Peter Kramer voices what is for me the essential message of this book when he writes: "The Darwin Foundation calls upon scientists and planners to make use of this case history when teaching a basic conservation lesson. Populations and biotic communities must be sufficiently protected and large enough to be safe not only when average environmental conditions prevail, but also during times of climatic extremes and stress".

I believe that this book which I have reviewed has one small fault. Its title should be expanded to include: "A basic lesson in conservation".

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