

# Preface

*Forsake, dear friend, all withered theories  
And hug the greening, golden Tree of Life.*

Faust

Charles Darwin's discoveries in the natural sciences began during his South America cruise. On February 20, 1835, during the Beagle's voyage around South America, he felt and described the great Concepción, Chile megaquake. In September of the same year he described the selective evolution of birds on the Galapagos Islands. The latter discovery eventually led him to formulate the Theory of Evolution.

The fate of Darwin's observations on earthquakes is less well known. Darwin intriguingly described seismic waves of the Chile megaquake as feeling like ocean waves, though he was standing on solid ground. His description was not taken at face value, partly because later work by Lord Rayleigh seemed to show that surface waves on land and at sea were fundamentally different. But Darwin was a shrewd observer and he may have been right all along.

This book is an attempt to demonstrate the analytical power of a holistic approach to the understanding of disasters. We take six major earthquakes in Latin America as an example of unity in diversity. Understanding disasters is a way of understanding the social system. The idea is showing that every major disaster is unique and different. We start out with discussing plate seismology and some basics of earthquake engineering. Why was Mexico City founded in a lake? Why is earthquake damage rising exponentially everywhere and why is this trend unsustainable? Why is history relevant for understanding earthquake risk?

The purpose of this SpringerBrief volume is to discuss the causes of severe damage in recent megaquakes in Latin America and how to prevent the recurrence of human and material losses caused by earthquake disasters. Future Springer-Briefs may apply a holistic approach to other types of disasters and in other regions of the world.

No two earthquakes are identical. Even if they were, the society is different. Building codes are attempts to adapt engineering experience to local conditions: they need to be updated. And so do theories. Every disaster teaches the same lesson in a different way.

The United States is spending an average of one billion dollars a week in prevention and mitigation of natural disasters, including earthquakes, floods, hurricanes, winter storms, and others. Latin America has its share of megaquakes: its societies need to spend more on disaster prevention and disaster research. We appreciate the valuable assistance of our students, Luz Aída Lozano Campos and Miguel Ángel Aguilar Dorado.

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A Holistic Approach

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