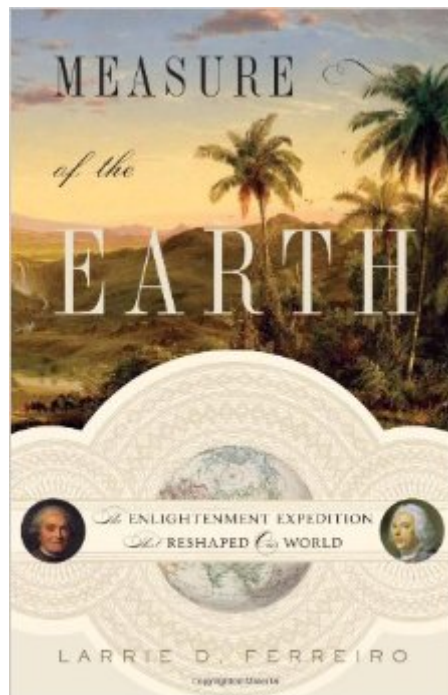


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Measure Of The Earth: The Enlightenment Expedition That Reshaped Our World



Synopsis

In the early eighteenth century, at the peak of the Enlightenment, an unlikely team of European scientists and naval officers set out on the world's first international, cooperative scientific expedition. Intent on making precise astronomical measurements at the Equator, they were poised to resolve one of mankind's oldest mysteries: the true shape of the Earth. In *Measure of the Earth*, award-winning science writer Larrie D. Ferreiro tells the full story of the Geodesic Mission to the Equator for the very first time. It was an age when Europe was torn between two competing conceptions of the world: the followers of René Descartes argued that the Earth was elongated at the poles, even as Isaac Newton contended that it was flattened. A nation that could accurately determine the planet's shape could securely navigate its oceans, giving it great military and imperial advantages. Recognizing this, France and Spain organized a joint expedition to colonial Peru, Spain's wealthiest kingdom. Armed with the most advanced surveying and astronomical equipment, they would measure a degree of latitude at the Equator, which when compared with other measurements would reveal the shape of the world. But what seemed to be a straightforward scientific exercise was almost immediately marred by a series of unforeseen catastrophes, as the voyagers found their mission threatened by treacherous terrain, a deeply suspicious populace, and their own hubris. A thrilling tale of adventure, political history, and scientific discovery, *Measure of the Earth* recounts the greatest scientific expedition of the Enlightenment through the eyes of the men who completed it—pioneers who overcame tremendous adversity to traverse the towering Andes Mountains in order to discern the Earth's shape. In the process they also opened the eyes of Europe to the richness of South America and paved the way for scientific cooperation on a global scale.

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Customer Reviews

What shape is the Earth? If you said round, of course you'd be right, and smart people have known this for a couple of thousand years, even if common sense tells you the Earth is flat (why, just look at it!). But the Earth is not perfectly round, not a perfect sphere; of course there are all those mountains and valleys, but in addition, it bulges out of the perfectly spherical. Before the eighteenth century, no one knew if it bulged north and south, or bulged outwards, although there were schools of thought that argued for both ways. They didn't have data to settle the issue. They needed good measurements, and how they first got the data is the exciting story of *Measure of the Earth: The Enlightenment Expedition That Reshaped Our World* (Basic Books) by Larrie D. Ferreiro, a recounting of a French expedition to South America which answered the question of the Earth's shape. Ferreiro had encountered one of the explorers of the expedition in his research for a book on naval architecture, and was amazed to learn about the Geodesic Mission, and even more amazed that its story and accomplishments were not known even in France. It is, however, a great story of an important scientific achievement and the huge amount of effort it took for the simple purpose of satisfying scientific curiosity. There were two schools of thought about the Earth's bulge - Newton said it bulged at the equator, and followers of Descartes said it bulged at the poles. No one had data. Ferreiro does an excellent job of giving a history of thought on the matter, and showing how scientists considered it important enough to set up a difficult and expensive expedition to get an answer by measuring a degree of latitude at the equator.

I subscribe to the aspirational adage, 'You can't know it all; but you can try.' So over the years I have attempted to maintain a catholic attitude while browsing the subjects of History books, focusing more on works that put the 'story' in History as opposed to any of my preconceptions about particular subject matter. My principal reason for purchasing 'Measure the Earth' was a fond recollection of having read Dava Sobel's wonderful 'Longitude' many years ago. The relatively familiar narrative of Horologist John Harrison's almost life-long quest to develop a reliable chronometer to enable mariners to reliably plot their east-west locations at sea, it suggested to me that since I had already ventured in one global direction, I may as well learn more about the other...all the while hoping it was as good a story. Well, how good is the tale told in 'Measure'? Let me put it this way. If you submitted this manuscript to a publisher as a novel, they would toss back

in your face and tell you to come back when you had a believable yarn. In other words, you can't make this stuff up! An unprecedented expedition to an utterly foreign shore with shaky financial support, dreadful, and eventually almost fatal, leadership, waxing and waning political tides, almost non-existent communications, the list of horrors goes on and on. But they did it. They set out to measure one degree of latitude, and using instruments that even in the day were considered obsolete, they came so close to the now-consensus figure that the difference makes no never mind. Actually, Author Ferreiro answers the rhetorical question of this review's title.

****"Thus, ... this type of indirect measurement was really child's play to the Alexandrians. They were eventually able to measure by indirect means the radius of the earth, the diameter of the sun and moon and the distance to the moon, the sun, the planets, and the stars. That we can measure such physically inaccessible lengths and do so, moreover, with an accuracy as great as we wish, seems, at first blush, incredible." -- Morris Kline
In the Principia, Newton first raised the question of the Earth's shape. Continental scholars influenced scientific efforts to solve the problem in Paris, while their French colleagues helped in advancing a theory on the Earth's shape. The evolution of French mechanics proved not to be the replacement of a Cartesian pattern by a Newtonian / Leibniz concept, failing Kuhn's paradigm of scientific revolutions. Instead, a complex process involving various tools of research and coordination from the entire scientific world contributed. Larrie Ferreiro both explores and reports the innumerable phases, and aspects of technical problems underlying the historical development of the post-Newtonian mechanics. He embeds his technical discussion in a biography framework that involves society, politics and institutional history. During the eighteenth century, the spread of Newtonian physics in the French scientific community, Newton's writings contributed only a small part to the central thesis of the work done on the shape of the earth. Continental scholars, especially Leibniz, influenced the entire French proceedings, and many French scholars participated in defining the final earth's shape theory.

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