# Marie Tharp:

# Portrait of a Scientist

Presented by Hali Felt, author of the book ***Soundings:*** *The Remarkable Woman Who Mapped the Ocean Floor*

Image courtesy of the Library of Congress.

Marie in the field with her father, William Tharp, a surveyor with the U.S. Soil Survey.

Image courtesy of the Library of Congress.

Marie on the streets of New York, shortly after she was hired to work at Dr. Maurice Ewing’s newly-formed Geophysical Institute at Columbia University.

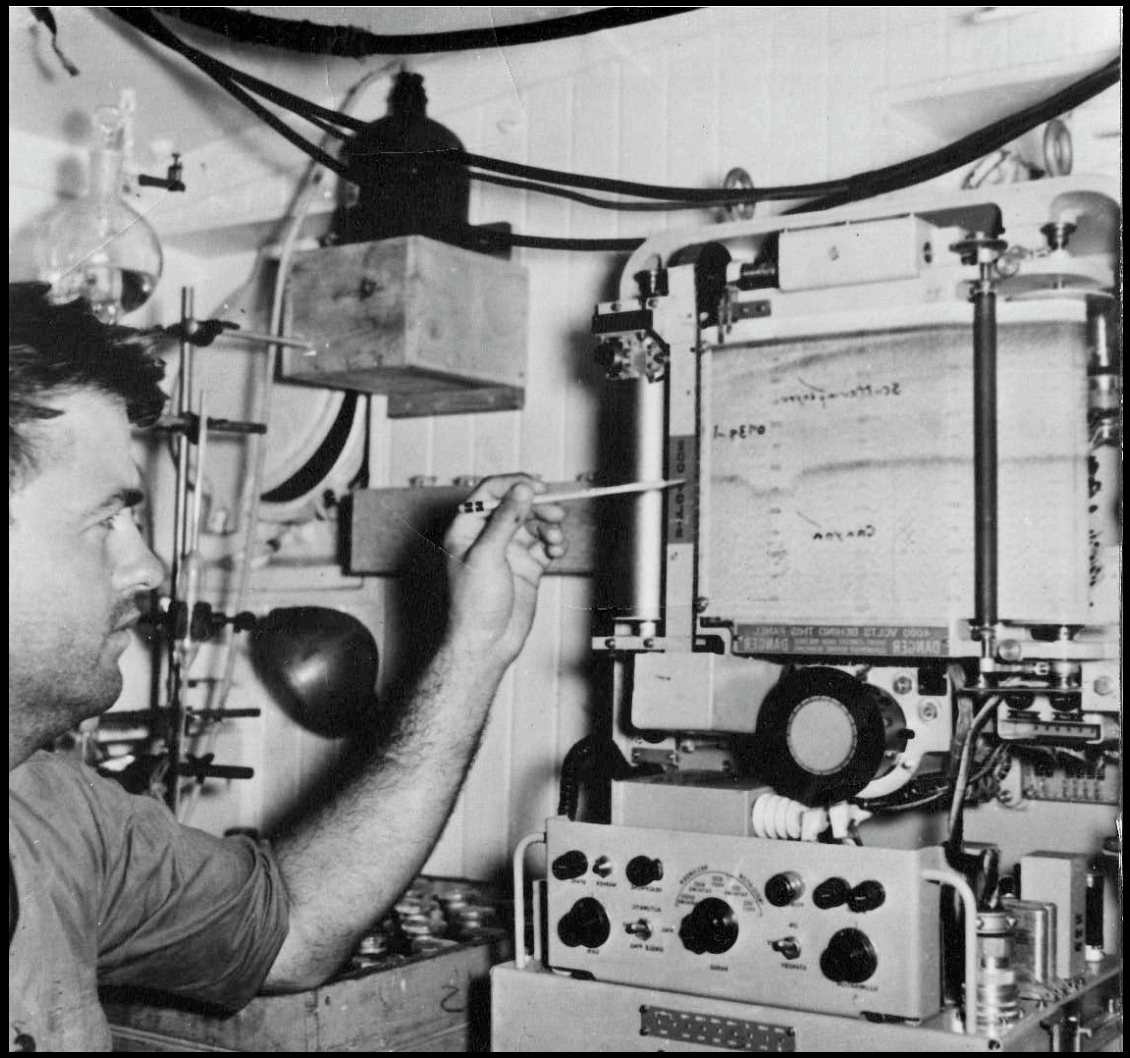


Image courtesy of Lamont-Doherty Earth Observatory.

Bruce Heezen looking at a fathogram being produced by an early echo-sounder.  Circa 1940s.

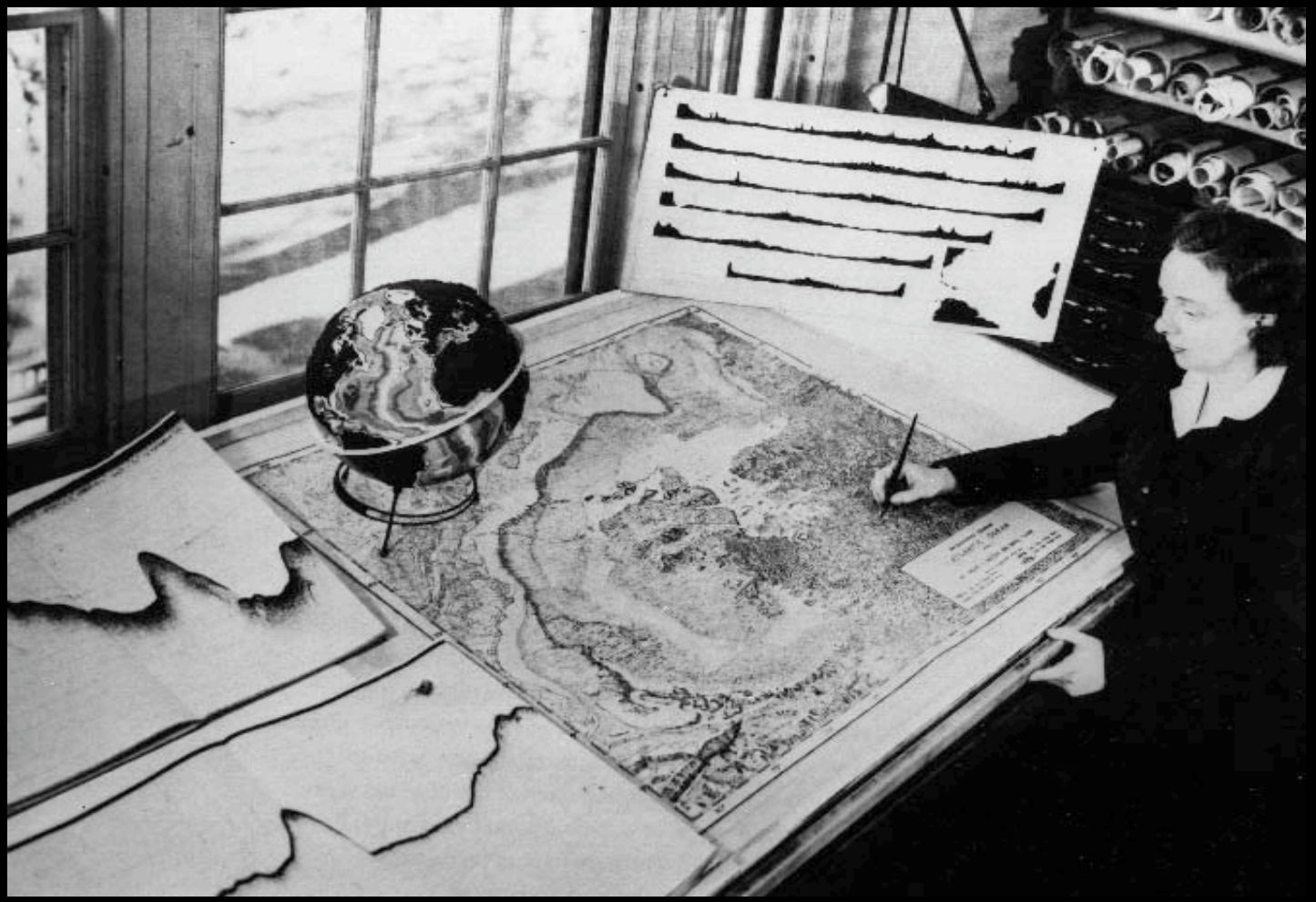


Image courtesy of Lamont-Doherty Earth Observatory.

**Marie in her office at Columbia University’s Lamont Geological Observatory, pretending to work.  Circa 1959.**

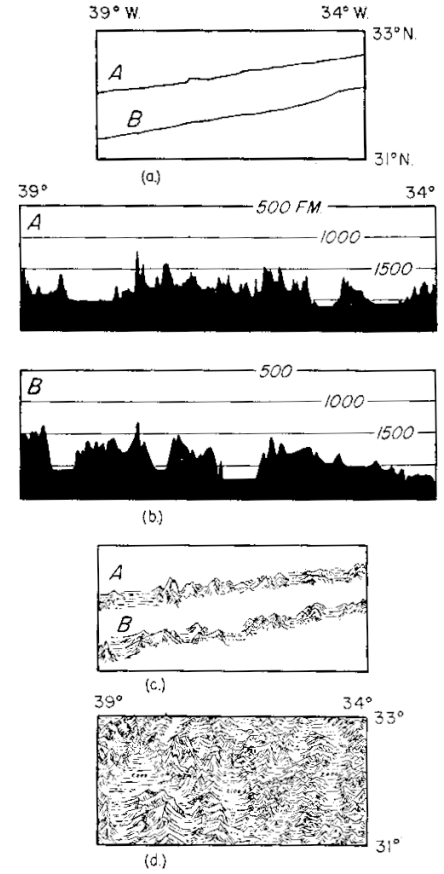
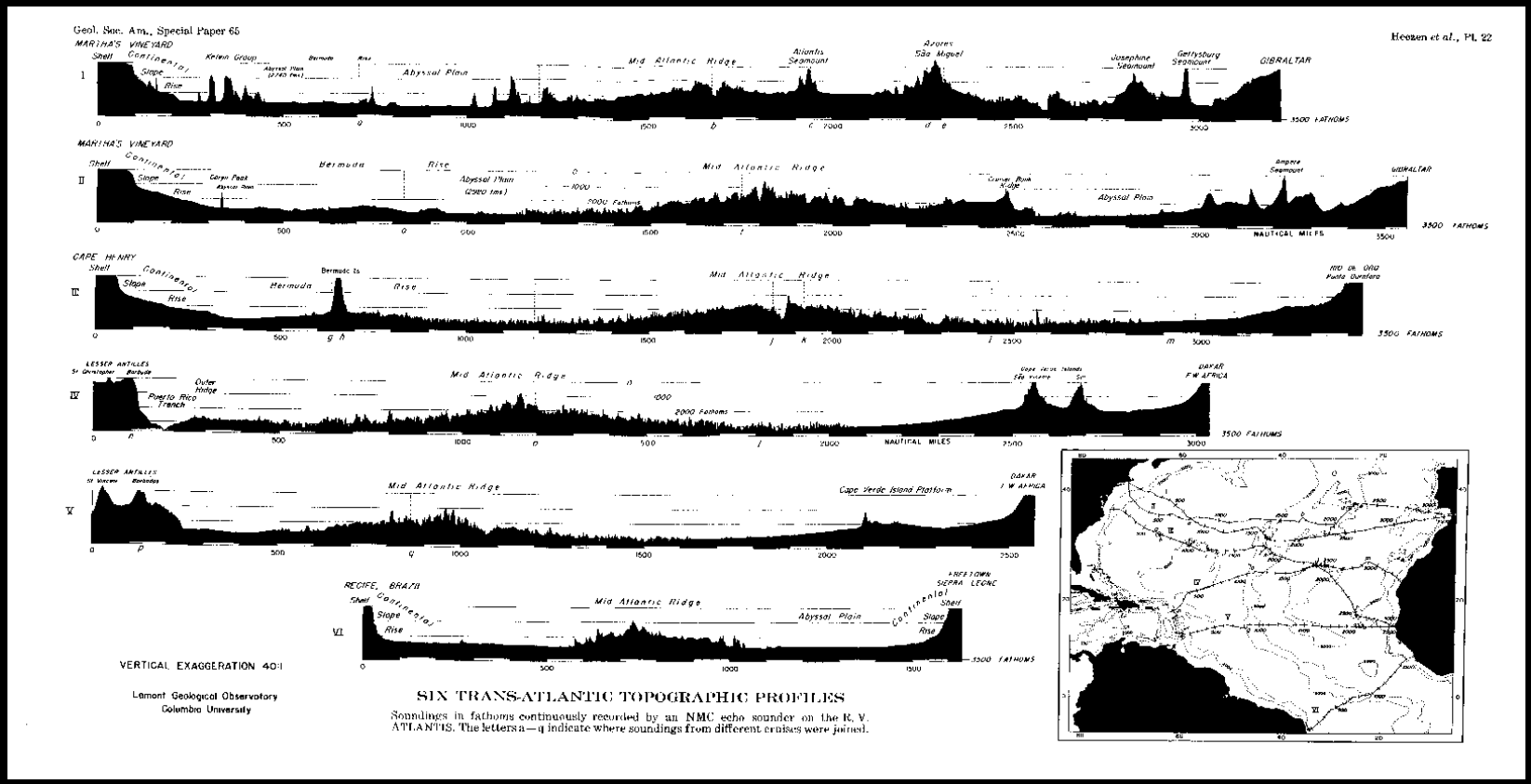



FIGURE 1.—*Method of preparation of physiographic diagram*

(a) Positions of sounding lines (A, B) are plotted on chart; (b) Soundings are plotted as profiles (A, B) at 40:1 vertical exaggeration; (c) Features shown on profiles (A, B) are sketched on chart along tracks; (d) After all available sounding profiles are sketched the remaining unsounded areas are filled in by extrapolating and interpolating trends observed in a succession of profiles.

An explanation of Marie's process from her first (and only) book. Co-authored with partner Bruce Heezen and Maurice Ewing. Published by the Geological Society of America in 1959 as *The Floors of the Oceans: I. North Atlantic*.




SIX TRANS-ATLANTIC TOPOGRAPHIC PROFILES

Soundings in fathoms continuously recorded by an NMC echo sounder on the R. V. ATLANTIS. The letters a—q indicate where soundings from different cruises were joined.

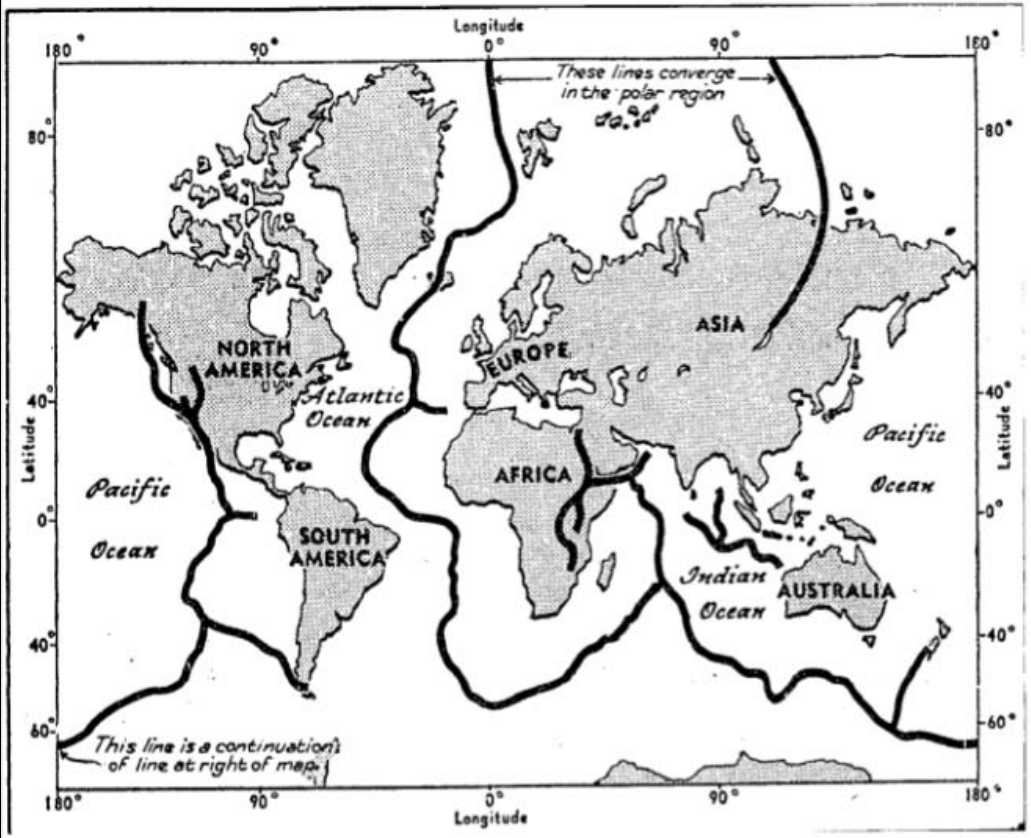
Image from the Geological Society of America.

The first six trans-Atlantic profiles. Marie used these to map the entire North Atlantic Ocean. Published in the Geological Society of America's Special Paper #65—***The Floors of the Oceans: I. North Atlantic.***


Image courtesy Marie Tharp Maps.

A portion of Marie's first published physiographic diagram, printed in 1957 and showing the Northeastern Atlantic Ocean floor.

# A Huge Crack in the Floor of the Oceans Is Traced by Geologists




The New York Times

Heavy lines denote a 45,000-mile continuous trench and a shorter one in the Indian Ocean

The New York Times

Dr. Maurice Ewing announcing findings yesterday.

Feb. 1, 1957

plained that the main line of the rift extended southward along the Atlantic from about the Greenwich Meridian in the Far North, bisecting Iceland, and running approximately midway between North and South America on the west and Europe and Africa on the east.

rom the New York Times, 1 February 1957.

The discovery of th ley was announced in 1957. In the articl ese illustrations, the *Times* said that “pulled apart.” As a result, Lamont rece bers of the public who feared for their safety.

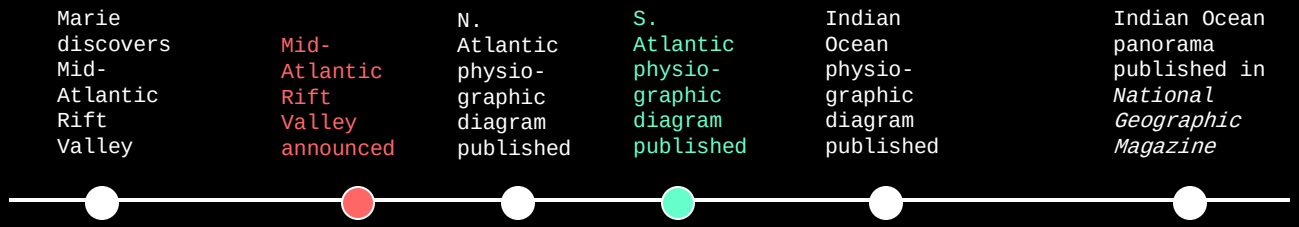
Image courtesy of the Library of Congress.

Hand-painted globe used by Tharp and Heezen at presentations in the late 1950s and early 1960s. Heezen had such a globe with him in 1959 when he gave a talk about the newly-discovered Mid-Atlantic Rift at Princeton University, causing Harry Hess to declare that Heezen had “shaken the foundations of geology.”

**Image courtesy of the Library of Congress.**

Jacques Cousteau in a two-man observation vessel aboard the *Calypso*. This photo was taken in 1959, when Cousteau docked his ship in New York for the First International Oceanographic Congress. At the IOC, he showed a film he'd taken of the Rift Valley while crossing the Atlantic; many previously skeptical scientists were convinced of the Rift's existence.

## Marie Tharp's Cartographic Contributions




## Seminal Papers in the History of Plate Tectonics

Harry Hess publishes "History of the Ocean Basins"

Bullard et al present "A Fit of the Continents Around the Atlantic"

J.T. Wilson publishes "A New Class of Faults and Their Bearing on Continental Drift"

W.J. Morgan presents "Rises, Trenches, and Great Crustal Faults" paper at AGU meeting

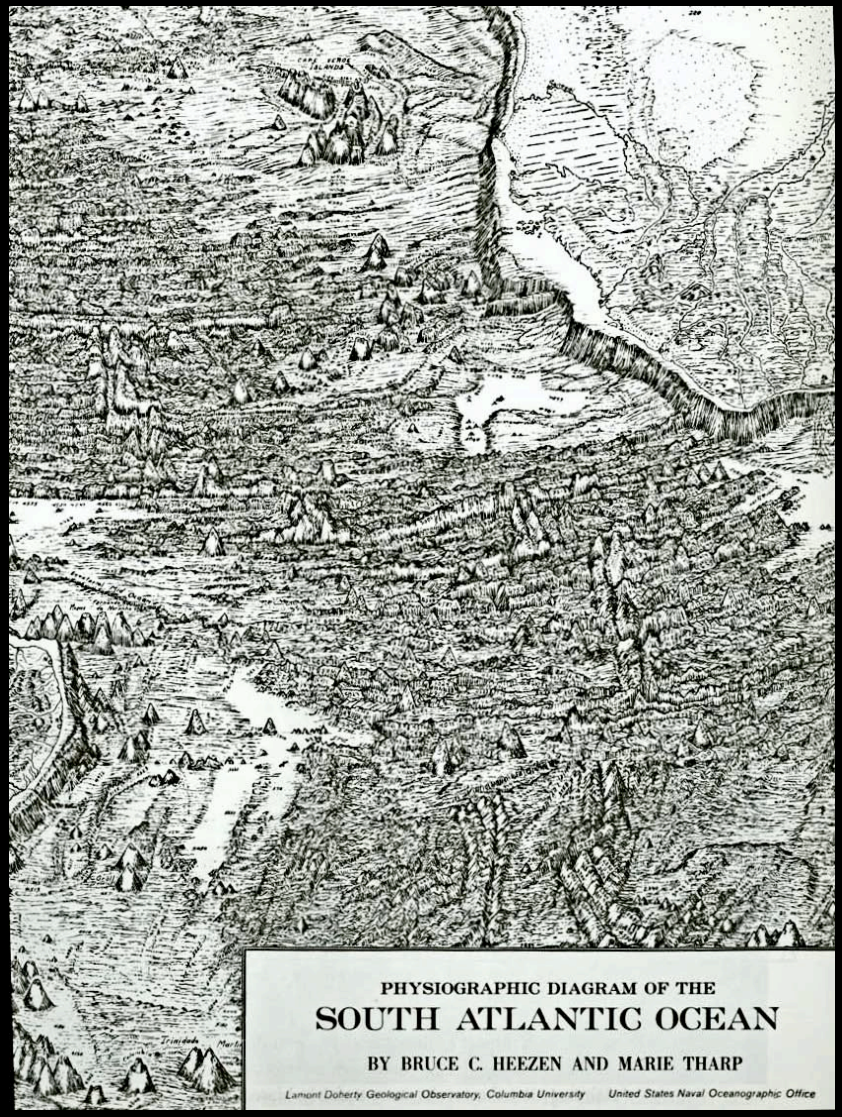



Image courtesy Marie Tharp Maps.

A portion of Marie's second physiographic diagram; note the increased level of detail and appearance of fracture zones. Published by the Geological Society of America in 1961.


Image from National Geographic Magazine.

Marie and Bruce's first collaboration with National Geographic Magazine and Heinrich Berann. Published as an insert to the magazine in October 1967, accompanying the article "Science Explores the Monsoon Sea."


Image courtesy Marie Tharp Maps.

The 1977 World Ocean Floor Panorama, painted by Heinrich Berann and based on 25 years of Marie's work.

# Questions to ponder:

- Why didn’t the scientific community recognize that Marie’s maps made arguments for geological processes?
- Why hasn’t Marie’s work been included in histories of the plate tectonics revolution?
- How can scientists, the media, and the general public begin to have conversations about the ways in which maps make visual arguments?