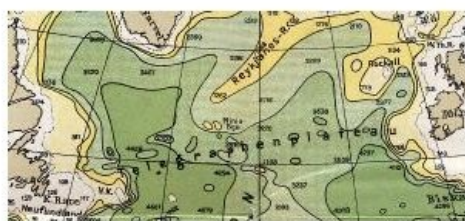
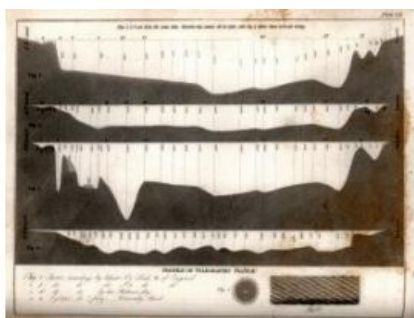


## A FEATURE FOR MORE THAN 50 YEARS

# The Myth of the Telegraphic Plateau



In the mid-nineteenth century the great hydrographic myth of a Telegraphic Plateau located in the North Atlantic Ocean was born. The origin of this myth began with the cruise of the USS Dolphin under the command of Lieutenant Commanding Otway Berryman, USN, in the year 1853. Berryman, acting under Matthew Fontaine Maury's direction, was the first to use the Brooke Sounding Machine and serendipitously sounded on and discovered the first indication of the Mid-Atlantic Ridge north of the Azores Islands. The Brooke Sounding Machine was actually a bottom sampling device that allowed recovery of a small bottom sample to prove that, in fact, the bottom had been reached by a sounding line. The small bottom samples thus recovered were sent to microscopists Jacob Bailey in the United States and Christian Ehrenberg

in Berlin, Germany. Bailey responded by late 1853 with the information that the bottom material consisted primarily of microscopic shells and that not a particle of sand or gravel existed in the samples. Bailey further noted that he believed that the shells originated with foraminiferans and diatoms living at the surface whose shells drifted to the bottom when these creatures died.

In late February of 1854, Samuel F. B. Morse, an inventor of the telegraph, visited Maury's office at the United States Naval Observatory inquiring about information concerning the laying of an Atlantic cable but Maury happened to be out at the time. This was fortunate for history as Maury recorded in a letter to Morse his thoughts that the soundings of the Dolphin the previous year "obtained all the information concerning the bottom of the deep sea between this [North America] and the British Islands that a submarine telegraph company could desire. From Newfoundland to Ireland the distance is about 1600 miles, and the bottom of the sea between the two places is a plateau which seems to have been placed there especially for the purpose of holding the wires of a submarine telegraph and of keeping them out of harm's way."

Maury expanded on Bailey's observations concerning the nature of the seafloor material and related to Morse his belief "that there are no abrading agents at work at the bottom of the sea upon the telegraphic plateau.... Consequently, a telegraphic wire once lodged there, it would remain as completely beyond the range of accident as it would if buried in air-tight cases.... Therefore the practicability of a submarine telegraph across the Atlantic is proved."

Perhaps it would not have mattered if these encouraging words had not been uttered as plans were already moving ahead for the laying of an Atlantic telegraph cable by Cyrus Field and a consortium of investors. However, Maury continued to tout the existence of this plateau in his first, and all subsequent editions, of *The Physical Geography of the Sea* and in the texts accompanying his wind and current charts. All was well with this concept until 1856 when the Navy Department ordered Lieutenant Berryman, apparently at Maury's request, to command the USS Arctic and run a line of soundings between the end points of the projected telegraph cable between Newfoundland and Ireland. This line of soundings apparently became the first ever made across an ocean basin as a distinct survey line run for the purpose of ascertaining the character of the bottom as opposed to soundings of opportunity made by naval vessels or the relatively random sounding attempts made on earlier scientific expeditions. With the benefit of today's knowledge of the seafloor in this area, the projected survey was to be run in the vicinity of the Charlie-Gibbs Fracture Zone, an area of seamounts, knolls, troughs, and rapidly varying topography with depths ranging from 400 fathoms to nearly 2500 fathoms – hardly the telegraphic plateau of Maury's imagination.

On this line and with supplemental soundings on the return line, Berryman obtained over 30 bottom samples and had two occasions on which the sounding line parted with over 3,000 fathoms of line out. He primarily used Massey's Depth Indicator as the sounding instrument and observed most of the soundings, whether by Massey Indicator or twine and cannonball,

*The segment of Maury's 1854 bathymetric map on which he would delineate the Telegraphic Plateau on the 1858 version.*

from the ship. The Massey Indicator was a mechanical system with an impeller that would only rotate when the instrument was being lowered. The motion of the impeller was recorded on dials that gave a record of the distance travelled vertically through the water column. After a three-week cruise, Berryman arrived in Ireland on 23 August. During his time there, he incurred Maury's wrath by handing over a version of the seafloor profile to the telegraph company and the British press which subsequently published it. On the return trip Berryman made a few additional soundings.

*The segment of Maury's 1858 bathymetric map of the North Atlantic showing his Telegraphic Plateau and Middle Ground.*

Whether Maury was more concerned with assuring the scientific integrity of the results or felt that he had been upstaged by Berryman is unclear. Either way, upon the return of the USS Arctic he attacked Berryman, the results of the survey, and the methods used in the

Explanations and Sailing Directions Accompanying the Wind and Current Charts published in 1858. He also entreated the British government to send out a sounding vessel to check the results of the Arctic as he declared "Most, if not all of the work done in this vessel ... has to be rejected". In 1857, the British government sent out the HMS Cyclops under the command of Lieutenant Joseph Dayman to run two lines of soundings across the Atlantic slightly north of Berryman's soundings. In the 1858 edition of the Explanations and Sailing Directions, Maury also published Berryman's sounding log as well as the original profile that Berryman had provided the British press and two others that Berryman apparently considered equally valid. The third profile includes the 3,000 fathom indications that were made on the western side of the Atlantic. Maury overstated his case in producing the first and the third profile (the 3,000 fathom soundings occurred on the third profile) at a greater vertical exaggeration, apparently to emphasise the perceived error, than the profiles without these soundings. He also produced a fourth profile obtained from the Cyclops soundings which showed an undulating bottom. Maury made the argument that profiles 1, 2, or 3 "cannot all be right; and Fig. 4 shows them all to be wrong." It did not occur to him that the seafloor might have sufficient bathymetric variation and that more than one profile might be correct. However, other than the possible 3,000 fathom soundings (since shown to be impossible) Dayman's and Berryman's surveys showed general agreement within a few hundred fathoms.

In the 1858 Explanations and Sailing Directions Maury added two names of undersea features to his previously published 1854 bathymetric map of the Atlantic. These names were 'Telegraphic Plateau' and 'Middle Ground'. The Telegraphic Plateau extended across the Atlantic Ocean from Newfoundland to Ireland in an area to the south of both Dayman's and Berryman's surveys. The name Middle Ground was placed in an area to the west of the shoal soundings of the Mid-Atlantic Ridge as discovered by Berryman in 1853. None of the soundings by either Berryman or Dayman were added to the map.

*The segment of Gerhard Schott's 1925 map of the Atlantic Ocean showing the Telegraphen Plateau. This was among the last, if not the last, maps of the Atlantic Ocean to show this non-existent feature.*

Besides the obvious problems associated with the sounding methods (no deep-sea sounding method seemed to have been reliable with an error less than a couple of hundred fathoms at that time), the navigation seems to have been primarily dead reckoning between sporadic astronomic fixes at least in the case of Berryman as he records numerous days of complete cloud cover and even encountered the remnants of a hurricane two days out of Ireland. His reported positions have the possibility of being in error by tens of miles. However, vestiges of truth are apparent between Berryman's and Dayman's soundings. First indications of Porcupine Bank, East Thulean Rise, Hecate Seamount, Minia Seamount, and Orphan Knoll are all shown on the surveys. Given the tools at hand, both Berryman and Dayman did creditable work under less than ideal conditions.

As a footnote to Maury's attempt to discredit Berryman's work, no less an authority than Sir Wyville Thomson, chief scientist of the Challenger Expedition, wrote in his 1873 work *The Depths of the Sea*: "... but the sounding voyage in which modern appliances were first employed with perfect accuracy with a practical object was that of Lieutenant Berryman in 1856, in the US steamer Arctic in which twenty-four deep-sea soundings were taken with the Brooke's and Massey's sounding machines on a great circle between St. John's, Newfoundland, and Valentia in Ireland, with a view to the laying of the first cable. The same ground was gone over by Lieutenant Dayman, in HMS Cyclops, in June and July 1857, and thirty-four soundings were taken, the depth being estimated by Massey's sounding machine and a modification of Brooke's machine ...." This vindication came too late for Berryman. He passed away while in command of the USS Wyandotte, off the coast of Pensacola, Florida, on 2 April 1861, one week before the opening shots of the American Civil War. Maury probably never saw Thomson's work as he passed away on 1 February 1873. However, the name Telegraphic Plateau lived on for over 50 years after Maury's death. Among the last maps to show a feature called the Telegraphic Plateau (Telegraphen Plateau) was a map of the Atlantic Ocean produced by the famous German oceanographer Gerhard Schott in 1925. Following the advent of acoustic sounding devices and an increased understanding of the complexity of the North Atlantic Ocean in the vicinity of the Charlie-Gibbs Fracture Zone, the name Telegraphic Plateau disappeared from the bathymetric maps of the Atlantic Ocean.

Both Otway Berryman, the first to discover a segment of the Mid-Atlantic Ridge and the first to run a survey line across an oceanic basin for the purpose of defining the nature of the seafloor, and Joseph Dayman, his British counterpart, are hardly remembered today. Neither of them has been commemorated by the naming of an oceanic feature in his honour. Perhaps this could be remedied.