

## g3 Oceanic sediments and seafloor spreading < pelagic >

I must go down to the sea again, to the lonely sea and the sky. And all I ask is a tall  
ship and a star to steer her by.  
—John Masefield.<sup>1</sup>

The uppermost part of the oceanic crust is comprised of sediments. Sediments of the continental rise and abyssal plains are terrigenous (shed from the continents). Seaward of these areas, and away from emergent land, dredge and drill-core samples show seafloor sediments to be pelagic oozes (settled calcareous and siliceous biogenic particles), “red clays” (settled meteoric dust), and orthogenic nodule-concretions (precipitated from bottom sea waters). These sediments, labeled Layer-1 (upper, unconsolidated) and Layer-2 (underlying, consolidated) in seismic-reflection profile images of the deepsea floor, rest on basaltic oceanic crust (Layer-3, that by seafloor spreading, forms at the ridge). Maps of Layer-1 are *Total (marine) Sediment (pelagic, orthogenic, and terrigenous) Database* (in progress, 1999) issued by NOAA (National Oceanic and Atmospheric Administration).<sup>2</sup>

Significantly, as a test for the truth of seafloor spreading, on oceanic rises, Layer-2 thickens with distance from the ridge.<sup>3</sup> □

### Figure g4.1 William Gilbert (b. 1544, Colchester; d. of the plague, Nov. 30, 1603, London

Physician to Queen Elizabeth, Gilbert was ‘the first man to raise himself from the Aristotelian morass and work scientifically through an entire field of inquiry’ (Price, 1958). The first prominent English Copernican, Gilbert is also credited with originating in *De Magnete*, the term and concept of ‘mass.’ In *De Mundo*, Gilbert wrote about comets, meteorological phenomena, and the nature of the sea. But his masterwork was his methodical investigation [beginning ca. 1581] of magnetism. Like Giambattista della Porta [1535-1615] [4] in Italy (whom he criticizes sharply and frequently in *De Magnete*), Gilbert formed one of the first informal scientific societies or academies, a forerunner of the Royal Society.  
—Mike Jackson.<sup>5</sup>

In *The Magnet, Book Fifth* (“Gilbert Club” translation, 1900) three paragraphs that follow upon each other record in succession: *observation*, *application*, and *metaphysics*:<sup>6</sup>

“The declination [*sic*: this word would be *inclination* in today’s parlance] of a magnetick needle above a terrella [model of the world, also called an *earthkin*] is shown by means of several iron wires, of the length of a barleycorn, arranged along a meridian. The wires [one shown] on the [the vertical line of the] æquator are directed by virtue of the stone toward the poles [of the *Axis*] and [at the equator] lie down upon its body along the plane of its horizon. The nearer they are brought to the poles, the more they are raised up by their versatory [*sic*] nature. At the poles themselves they point perpendicularly toward the very centre.

“We may see how far from unproductive magnetick philosophy is, how agreeable, how helpful, how divine! Sailors when tossed about on the waves with continuous cloudy weather, and unable by means of the cælestial luminaries to learn anything about the place or the region in which they are, with a very slight effort and with a small instrument are comforted, and learn [from the inclination of the compass needle] the latitude of the place.  
(cont.)

