

# Seismic-refraction measurements in the Atlantic Ocean basins, in the Mediterranean Sea, on the Mid-Atlantic Ridge, and in the Norwegian Sea.

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## SEISMIC-REFRACTION MEASUREMENTS IN THE ATLANTIC OCEAN BASINS, IN THE MEDITERRANEAN SEA, ON THE MID-ATLANTIC RIDGE, AND IN THE NORWEGIAN SEA

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## Abstract

Seismic-refraction measurements in the western basins of the North Atlantic Ocean show that an average crustal section consists of  $\frac{1}{2}$ –1 km of low-velocity sediments and 4–6 km of oceanic crustal rock in which the seismic velocity is about 6.5 km/sec. There is good evidence from sub-bottom reflections and shear waves that in many places there is a layer with a velocity between 4.5 and 5.5 km/sec and a thickness of 1–2 km between the low-velocity sediments and the 6.5 km/sec layer, although it is not usually detected by refracted arrivals. These layers are underlain by the mantle which has an average seismic velocity near 8 km/sec. Measurements in the eastern basins show a similar crustal section, but the velocity below the deep discontinuity appears to be lower (7.7–7.8 km/sec).

Measurements in the Mediterranean Sea show only low-velocity sediments underlain by a refracting layer in which the average velocity is about 4.5 km/sec.

On the Mid-Atlantic Ridge the sediments are underlain by two refracting layers with velocities averaging 5.6 and 7.4 km/sec respectively. The results indicate that the ridge has been built by the upwelling of great amounts of basalt magma along a tensional fracture zone. Presumably the extensional forces and the supply of basalt magma come from convection currents deep in the mantle. Measurements in the Norwegian and Greenland seas show results very similar to those on the Mid-Atlantic Ridge, and, from this and the extension of the belt of active seismicity, it appears that the ridge structure continues through the Norwegian and Greenland seas into the Arctic Ocean.

The results of a few stations on the continental shelf of North America, Britain, and Norway are presented and compared with previously published results in these areas.

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