miles an hour. Off Charleston the mean hourly flow is three miles; from there to New York it diminishes to 2½ miles, and off the Banks of Newfoundland it is but 1½ to two miles. The rate of flow and other characters of the stream are thus largely due to the existence between the American continents of the great Mexican Gulf. The Mediterranean Sea, on the opposite side of the ocean, has no such effects, partly because it is on the wrong side of the ocean for the production of them.

The straits of Florida have a width of about 48 miles off Jupiter Inlet, and a maximum depth of 2634 feet; and 95 billion tons of water pass per hour. The current reaches a zero velocity at a depth of 1800 to 2100 feet. North of the Bahamas the stream passes over the plateau bottom to Charleston with a mean depth of 2400 feet, and width of 75 to 100 miles; and thence to Cape Hatteras, the depth diminishing to 1800 feet. North of Cape Hatteras, the coastward wall is in a depth of about 390 feet; and inside of this wall, as well as to the eastward of the stream and beneath it, flow the cold waters of the Labrador current. Owing to the delay of the waters in the Caribbean Sea and the Mexican Gulf the heat of the tropical waters is much augmented for distribution along their northeastward course.

In the central North Atlantic, between the eastward and westward parts of the circuit, exists a region of calms in both winds and currents, with great areas of floating seaweeds, which is called the *Sargasso Sea*. The seaweeds shelter a large variety of fishes and inferior living species.

A belt in the equatorial region, just north of the equator, is the course of a counter-current both in the Pacific and Atlantic. Currents are generally made in the ocean by the prevailing winds; and local and temporary currents, often of great geological importance, by the winds of a long-continued storm.

(2) **Oceanic temperature.** — The currents of the ocean are a means of distributing its heat or cold over the globe, and making cold or warm climates for land and sea. Tropical currents carry tropical heat to the colder regions of the globe; and, conversely, the cold-temperate and polar currents convey cold; but the former mostly as a superficial flow, seldom affecting depths below 3000 feet, while the latter move at all depths from the top to the ocean's bottom. The colder waters are the heavier; but when flowing along a coast region as a lagging current, they move up the shelving bottom to the surface in spite of any warm waters in their way; and whatever shoals they encounter in their course, they spread up and over them, only a little affected in temperature by the waters they displace.

Superficial effects over the ocean. — As a consequence of the elliptical movement pointed out, and illustrated in Fig. 26, the waters of the tropical or warm side in the circuit strike the east borders of the continents; and those of the high latitude, or cold side, the west borders. They therefore tend to widen the areas of warm water on the west side of an ocean, and