when viewed from a distance it is blue—"The blue, blue sea." In the tropics and some parts of the Mediterranean, along the eastern shore, it is indigo blue. In other places it is a deep green; still others, a slate gray. The climate appears to have nothing to do with changes of colour. "Fickle as the sea" is true of its colour, as the changes on its surface. In some places the water is black; in others, white or beautifully transparent. In the *fiords*, off the coast of Norway, the water is marvellously clear and transparent. At the depth of twenty-five fathoms the smallest object can be seen on the sandy bottom. The water magnifies as the lenses of a microscope. According to one writer, the Polar oceans are a very beautiful blue. While in the Bay of Naples the rays of the sun, falling upon the water, cause it to sparkle as flakes of silver. The Black Sea derives its name from the storms and tempests that sweep over it, while the White Sea gets its name from the great masses of floating ice.

The natural colour of the sea is often modified, moreover, by the presence of animal and vegetable life. Hence it is that certain parts become, at times, milk white; while at other times and places the water is red as blood, as though the sea had ruptured an artery. This change in colour is due to masses of sea-weed, which float upon and near the surface. The Red Sea often appears like a restless, tossing sea of blood; while a few years ago the Atlantic was covered with a dark purple mantle, which extended over many square miles. In ancient times this phenomena was believed, by nervous and superstitious persons, to portend some awful calamity and visitation of the Divine anger and judgment. But science has solved the dark, portentous mystery, and quieted people's nerves by showing them to result from innocent and harmless causes. The black mud and yellow sand at the bottom of the ocean, as well as the colour of the sky overhead, has very much to do with the appearance of the water. In some regions, as in the neighbourhood of the West Indies, the water is so marvellously transparent that ships sailing over the surface appear to hang suspended in the air, and plants and animals are plainly seen on the bottom.

It is probable that the water has a colour of its own, which is either blue or green. At night, and when roughened by wind, or the passage of a vessel, or dip of oars, the ocean sparkles and flashes as though on fire. In the Southern seas, sailors tell of balls of fire, that roll over the waves, and cones of fire and glittering serpents, chasing each other and wriggling and crawling with their fiery crests and flashing tails. All this illumination and glare are caused by the presence of phosphorescent animals, that crowd by millions every drop of water and flit over the waves, lighting them up as with internal fire. Every drop of water is alive, and seems to crawl and burn with these little flashing animalcule.

Extent.—It is by no means easy to determine the exact extent of the ocean. The slow and sure diminution of the land, caused by the friction of the waves wearing away the shores, changes the form of the globe. It has been clearly demonstrated that the ocean covers two-thirds of the surface of the earth. Hence more than 2,000,000 of square miles are under water.

Depths.—The depth of the ocean is very uncertain, and has been much overestimated. The difficulties in the way of deep-sea soundings are great, and of such a nature that the result cannot be depended upon when they exceed 2,000 feet. The sounding line is continually driven aside by the strong currents of the sea, and assumes an oblique instead of a vertical direction. The ocean is too lively to be measured. The line, moreover, continues to run out after it reaches the bottom. Various contrivances, however, have been invented to overcome these difficulties, and fairly reliable measurements have been made. According to one celebrated man the depth of the ocean is nearly 10,000 feet. According to another, the depth of the Atlantic is nearly 3,000 feet, while the Pacific is 13,000. Not far from our shore a naval officer threw a vertical sounding-line 33,000 feet, thus contradicting the calculations of Laplace, who, estimating the influences exerted upon our planet by the sun and moon, declares that the mean depth of the ocean cannot exceed 25,000 feet. How are we poor ignorant mortals to know how deep the ocean is when learned doctors so disagree? However, it has been conclusively shown that the ocean does reach immense depths, which equal, if they do not surpass, the height of the loftiest mountains in India and America. The deepest water is in the Mediterranean Sea.

In some places, on the other hand, the water is extremely shallow. Immense banks and shoals traverse the ocean, while, at the mouth of many rivers, bars are formed. At the mouth of the Po the water is not more than 150 feet deep, while the Baltic Sea is nowhere more than 600 feet. The shallowness of the straits which separate England from France encourage the hope that the two countries may, ere long, be united by a submarine tunnel.

Bottom.—The bottom of the ocean is composed of mountains and valleys, vast elevations of table-lands, of hills and plains. Our continents are, in fact, only the dry and variegated summits of these ocean mountains and table-lands. Shoals and banks are the more elevated plateaus of the ocean. Slopes of precipitous mountains, like those of St. Helena, are everywhere found beneath the water, at the base of whose cliffs no bottom has yet been reached. If the continents, with their mountain ranges and valleys and vast plains, their hills and gorges and defiles, were sunk down to the level of the ocean bed, and covered with water, we should have an exact representation of the present ocean bottom. The present continents were once the bottom of the sea, and were lifted out of their watery graves on the shoulders of the volcano. This the marine shells on the tops of the highest mountains conclusively proves. If the bottom of the present oceans were some morning lifted above the water by the same Titanic volcanic upheaval, we should have other continents similar to our present ones. If the surface of the globe, instead of being uneven, were smooth as an ivory ball, the sea would cover it to the depth of 650 feet.

Distribution.—The southern hemisphere is much more abundantly supplied with water than the northern. The great globe is divided into two parts—the sea-world and the dry land. The bulk of the land-world lies in the north-eastern section of the earth, while the ocean reigns and revels in the south-western.

Temperature.—The ocean consists of three immense basins. The first two are at the poles; the third, under the equator. The temperature of the water is tolerably high at the surface, but at the depth of 1,200 fathoms it sinks to forty degrees. As you move away from the equator, in either direction, the cold water comes nearer the surface. On reaching the latitude of forty-five degrees it rises within 600 fathoms. Thus the same temperature is found at one-half the depth. At this distance there appears to be a zone all around the earth where the water is the same temperature at all depths; singular fact. As you approach the poles, however, from this zone of uniform heat, the temperature rapidly sinks until the surface of the water is frozen, and magnificent icebergs float in all directions. The light falling and playing upon their minarets and ice-spires and needles, give them a wonderfully gorgeous and brilliant appearance, a frozen beauty, and a cold and stately grandeur.

Currents.—Immense currents march in different directions through the sea. Magnificent oceanic rivers; they bear the cold water of the poles toward the tropics to cool and invigorate them, while they bear into the frigid regions the heated water of the equator. They perform the same office for the sea that aerial currents do for the atmosphere.

These currents are due to two causes—heat and the revolution of the earth on its axis. Near the equator, as we have already seen, the water is quite hot, while, at a certain depth, it maintains its icy coolness. The cold water from the two poles, heavier than the heated water of the tropics, is continually rushing forward toward the equator, growing warmer as it approaches it. Thus the cooler water flows below, while the warmer and lighter moves along the surface above. The latter, driven toward the poles, meets the polar stream coming in the opposite direction at the point where the water is of uniform temperature at all depths, thus forming currents above and below, running in opposite directions, and, where the land renders this impossible, side by side.

The rotary motion of the earth, moreover, differs at the equator and the poles, moving with only half the velocity at the latter, therefore the polar currents cannot move in a straight line toward the centre, but are swept aside, in a curve, from east to west. The north polar current follows the coast of North America, while the southern current moves along the shores of Chili. In the tropics, both currents are effected by the trade-winds, and thus form an equatorial current nearly 250 miles in width, encircling the whole globe in one majestic river.

These currents are a boon and benediction to navigation, wafting the mariner, on strong and steady winds and a powerful stream, on his way as far in a few days, as in months before their presence and direction were well understood.

The grand purpose of these currents seems to be to equalize the temperature of the globe. The Atlantic currents temper the heat of the South American coast, while the Gulf Stream brings mild winters to Ireland, England, and Norway, and keeps back the icebergs that else would drift down upon their shores. Hence, in the Old World, trees grow and fields are green, flowers bloom and fruits ripen, ten degrees further north than with us; and agriculture is carried on and cities flourish and delightful homes abound at a latitude which, in our country, is uninhabitable and covered with perpetual snow and ice. A large portion of the Old World depends entirely upon the beneficent Gulf Stream for its existence and prosperity.

Currents of the ocean, like currents of air, create gyrations, which, in some parts of the sea, have the appearance of whirlpools or maelstroms. Some of them run up hill; others, on a level. The ocean, as well as the air, has its system of circulation—its veins and arteries—which obey the laws of gravity. The plants and people of the sea, its flora and fauna, are all creatures of climate, and are as dependent upon temperature as those of the land. Were it not so we should find the fish of various sorts, the corals and marine insects, equally distributed and mixed and jumbled together. But they each have their habitats—places where they dwell, and are at home. Tropical fish and sea flowers are as rarely found in northern seas as Esquimaux and ice-huts in Cuba or Panama. It is the circulation of marine currents that equalize and preserve the temperature of the ocean, and secure to it all the diversity of climate we have on the continents