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### HOW DEEP IN THE OCEAN CAN ONE SEE WITH NATURAL SUNLIGHT?

Even when perfectly clear, water is at least a thousand times more opaque than air because of the density difference. The depth to which one can see in the ocean is dependent on the amount of suspended matter and the angle of sunlight. Underwater visibility is best at noon when the sun is directly overhead; at that time about 98 percent of the light penetrates the sea surface. When the sun is at an angle of 10 degrees above the horizon only 65 percent of the light penetrates; the rest is reflected.

Tropical waters usually have high transparency; the Mediterranean Sea, particularly the eastern section, is also noted for its good transparency characteristics.

As a diver descends into the ocean, the first change he notices is that everything appears to be blue-green; when he approaches the 100-foot level, it becomes impossible to distinguish colors. Light appears to come from all directions and there are no shadows. Cousteau reports that at 300 meters the pale blue lighting is hardly sufficient to define the shapes of objects a short distance away.

Sometimes horizontal visibility is better at greater depths because of the higher amounts of suspended materials in surface waters. Italian divers working on the liner 'Egyp' southwest of Brest, France, reported that visibility diminished as they went to a depth of 66 feet, then improved. Light faded as they reached the wreck at 396 feet; at that depth visibility was 6 feet. ("Questions About the Oceans," U.S. Naval Oceanographic Office.)