Each point on a wave front can be thought of as a point source of waves. The waves from all the point sources interfere constructively only along their envelope, which becomes the new wave front.

When part of the wave front is blocked, the constructive interference of waves from points on the wave front extends into the "shadow" region.

When all but a very small portion of a wave front is blocked, the wave propagating away from that small portion is nearly the same as that from a point source.