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# The Hollow Earth

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If there were a hall of fame for pseudoscientists, surely Cyrus Teed would deserve a place of honor. It was shortly after the Civil War that Teed had his vision: The earth is a hollow sphere, and WE LIVE INSIDE IT. Everything else in the universe is in here with us -- planets, comets, stars -- everything. What's outside the sphere? Nothing.

Teed's cosmology had a particular appeal to religious fundamentalists. It made the earth important again, rather than an insignificant speck in the cosmos. And it eliminated the difficult concepts of infinite space and aimlessly scattered worlds. We're all right here together in this safe, spherical womb.

In 1870 Teed changed his name to Koresh (ancient Hebrew for Cyrus) and started a cult. At its peak in the Nineties the Koreshan (pronounced ker-ESH-an) Unity movement had some 4,000 followers. Teed established a religious/scientific community a few miles south of Fort Myers, Florida, and there founded the town of Estero. He was determined to prove his theory scientifically and launched his own geodetic survey in 1897 to do just that. Using his "rectilineator," a set of double-T squares made of large logs, he projected a horizontal line until his calculations indicated that it would plunge into the Gulf of Mexico, four miles from its starting point. This was Teed's proof that the earth's surface is concave and that his rectilineator line had intersected the earth's upward curve.

The scientists had gotten everything backward: It is centrifugal force, not gravity, that keeps our feet planted on the ground. The sphere *is* about 25,000 miles around, just as the scientists say. China is about 8,000 miles away, through the earth's center -- straight up.

The Nazis entertained many occult theories in their quest for world domination, and Teed's was one of them. At one point a Nazi expedition went to the Isle of Man. Its mission: to get secret photographs of the United States by pointing its powerful telescopes *up*.

What's most infuriating is that a little mathematical fiddling turns this crazy theory into a proposition that is virtually impossible to refute. The trick is done by *inversion*, a purely geometric transformation that lets a mathematician turn shapes inside-out. When a sphere is inverted, ever point outside is mapped to a corresponding point inside, and vice versa.

The geometry is quite simple. If a sphere's center is "C" and its radius is "r," then every outside point "P" maps to an inside point "P'" such that  $CP \times CP' = r^2$  (that's "r squared" - Foxx).

{My apologies for not being able to include the accompanying illustration. - Foxx}

Here's a good way to visualize it: For any outside point "P" (on the sun, or Pluto, or Cygnus X, for example), draw a circle that has "CP" as its diameter. From one of the two points where this circle intersects the earth, draw a line perpendicular to "CP." The intersection point {of this perpendicular and "CP"} is the location of "P'".

By far the largest body in our inverted Earth is the moon; a bit over half a mile in diameter and some 3,933 miles over our heads. The sun's sphere is only eight feet across. The stars are microscopic spots clustered around the center, which is, of course, infinity.

Is there any way to prove we \*aren't\* inside a hollow earth? We asked H.S.M. Coxeter, mathematics professor at the University of Toronto and an expert on inversion geometry. "I can't think of any," he said. "A rocket flight, an eclipse, a Foucault pendulum, a Coriolis effect -- any observation we can make on the outside of the earth has an exact duplicate version inside. There would be no way to tell which was the truth."

Just as the geometry of space inverts, so do all the laws of physics. Toward the center of a hollow Earth, light slows down and everything shrinks -- atoms, astronauts, spaceships, and measuring rods. Light travels in circular paths, producing some weird (but lawful) optical effects. Astronauts on the moon looked back on what they thought was a blue sphere in the distance. Actually it was the inside of the earth's shell, through sight lines that flared like the bell of a trumpet, producing the \*illusion\* of a sphere. The optical distortion is something like the wide angle view through a fisheye lens.

As we look to the sky and the horizons, our visual field is filled with a sphere some 4,000 miles in diameter. Celestial bodies that revolve around the earth's center appear to "rise" and "set" as they enter or leave that sphere.

Cyrus Teed said that the moon is an illusion, that gravity is really centrifugal force, and that a horizontal line on the earth's surface eventually intersects the earth's upward curvature. We like to think that if he were alive today he would junk some of his earlier predictions to conform to inverse geometry, thereby keeping his theory irrefutable.

The centrifugal-force idea is demonstrably false. If it were so, there would be two points on the earth's surface where the force disappeared -- along the axis of spin. It is gravity of a peculiar kind that pulls us all to the outside. Teed's rectilineator experiment must have been in error. A line that appears horizontal actually curves in toward the center and so gets farther and farther "above" the surface.

Teed would have embraced Einstein's view of a finite, bounded universe in which light travels in circles and eventually returns to its starting point. An infinitely powered telescope aimed straight up, Einstein said, will eventually produce a view of the other side of the earth. That idea might seem paradoxical to most of us, but it would have been intuitively obvious to Cyrus Teed.

... the Australian Journal Speculations in Science and Technology has published an article by Mostafa A Abdelkader, of Alexandria, Egypt, that considers in all seriousness the proposal that we really \*are\* in a hollow Earth. Abdelkader says that the only way to test the theory's validity is to drill a tunnel straight through the earth. Until such an experiment is performed, he writes, "it seems ... that the odds are strongly in favor of [a hollow Earth] being our actual universe."

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