Galaxy
SCIENCE FICTION

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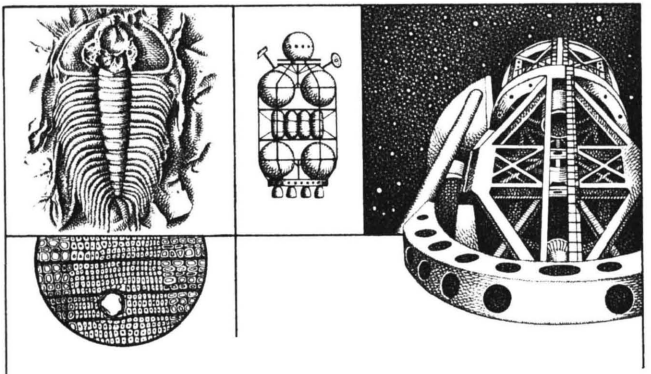

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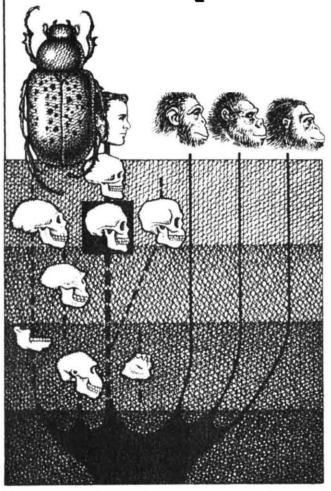


By WILLY LEY

THE HOLLOW EARTH

ABOUT two years ago, I received in the mails an envelope postmarked Lindau, which I knew to be a town near Lake Constance. It was adorned with two rubber stamps: one was simply the name and address of the sender; the other said (in German, of course), "Do not throw away. Please pass this on." Inside were two small pamphlets, one in German and one in English, both substantially the same, advertising matter for three books written by one Karl Neupert.

Below Mr. Neupert's picture

was added in ink: "Died February 8, 1949." The books I was supposed to buy and the new *Weltanschauung* to which I was to be converted were something that really was no longer news to me.

I had made their acquaintance around 1925, when bookstores were supplied with posters that promised to show the Earth and the Universe—yes, that's right, the Earth *and* the Universe—as it "really" was. The just-discovered secret of creation was that both were the same.

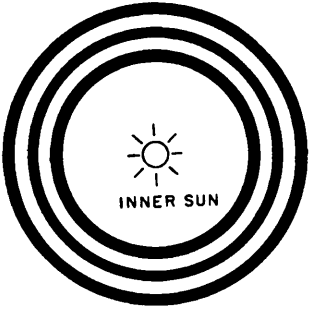
The Earth, Mr. Neupert said, was actually hollow and, while its diameter was about 7950 miles as geographers have asserted for quite some time, we lived on the inside of this hollow Earth. And the hollow Earth also contained the Universe.

In the center of the hollow Earth there floated a sphere, a thousand miles or so in diameter, which was either black or very dark blue. Luminous points representing the constellations and the Milky Way were attached to this sphere and around it moved the Sun and the planets, all of them much smaller than astronomers thought.

When the Sun was on one side of this sphere, the opposite half of the Earth had night, since the sphere was material and cast a shadow. Then, in the course of 12 hours, the Sun moved around the central sphere—called "Phantom Universe"—and naturally the other half of the "Inner Earth" had daylight.

I don't recall whether it was stated or not just what the "Phantom Universe" consisted of, but I do recall that it was forbidden to ask what was outside the "world egg," to use Mr. Neupert's own term for the whole. He modestly said that even he could not answer that question.

THE English-language pamphlet began with the words: "The Heavens? Illusion! The Immense Universe: Absurdity! The Earth is a Cosmic Cell, Universe Inside. We live on the Inside Surface." The illustration was the same as that on the German pamphlet, with only one minor



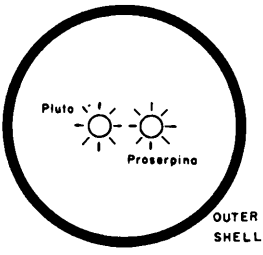
The hollow Earth as conceived by Dr. Edmond Halley.

change: in the German pamphlet, Europe had daylight; in the English pamphlet, the Americas had daylight, a fine point from which I concluded that the publisher did not expect many sales in Great Britain.

Herr Karl Neupert had changed to Mr. Charles E. Neupert and there was another interesting inked addition. The printed pamphlet said that all this had been "discovered by Charles E. Neupert." This was revised to read: "Discovered by Prof. U. G. Morrow, Chicago 1897, developed by Charles E. Neupert." Presumably because I had never heard of Professor U. G. Morrow, there was still no sale.

The episode came to mind again a few weeks ago, when I received a letter from an Air Force officer who wanted to know whether it was really true that somebody once said that the Earth was hollow, with an internal sun as well as an external sun, and that there was a hole near the pole large enough to fly an airplane inside.

The answer to the query is that somebody had actually said so, except that he wanted to sail "inside" with a ship and carry the airplanes for exploration of the Inner World—at the time, airplanes did not have ranges of more than a few hundred miles. Actually the man who said so, a



The hollow Earth as imagined by Sir John Leslie.

Mr. Marshall B. Gardner, was only the last of a long but somewhat disconnected line of hollow Earth advocates.

In fact, the concept began with two men of science who are still known to science as pioneers in many fields. One was the Scottish mathematician and physicist Sir John Leslie, who lived from 1766 to 1832 and who wrote on "Natural Philosophy" and worked out experiments to explore "the Nature and Properties of Heat."

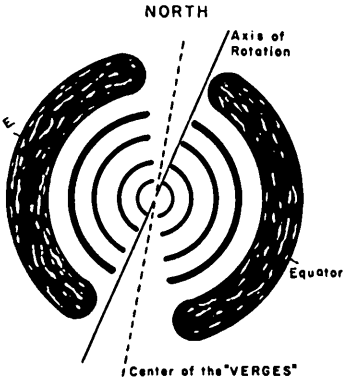
The other man, who lived just about one century earlier, is even more famous. He was Dr. Edmond Halley, the first man to predict the return of the comet named after him, and also the first to state in so many words that the Earth's atmosphere must have an upper limit. Edmond Halley must have formed his idea about the internal constitution of the Earth at about the time he be-

came editor of the *Philosophical Transactions* of the Royal Society (in 1685); his own paper appeared in the *Transactions* in 1692.

AMONG the many things which interested Halley were the vagaries of the Earth's magnetic field. If you put all the reports together—and Halley excelled in assembling reports from all sources and drawing conclusions from them—it seemed as if the Earth's magnetic poles did not stay put in one place. Trying to explain this strange behavior, Halley produced charts of the deviations of the compass needle and then said that these deviations might well be based on the internal structure of the Earth.

If the Earth consisted of three concentric shells, the observed facts might be explained by assuming that the three shells rotated with minute differences in speed. It was probably only a matter of seconds, or even fractions of a second, per day, but these differences caused the observed "misreadings" of the compass needle.

Since the innermost shell of the three was still a hollow shell, one had to assume an empty space at the center, but Halley did not want to believe that it was completely empty. So he postulated that at the center of the whole there was a sphere of glowing hot matter, a kind of miniature sun. Nobody would ever be able to see it because the three shells were unbroken and hundreds of miles in thickness.



Captain John Cleve Symmes' hollow Earth.

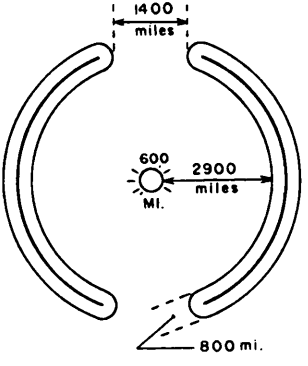
As far as one can tell, Halley's contemporaries were not very much impressed with the whole idea, though they welcomed the chart of the magnetic deviations. The matter more or less lapsed in the course of the ensuing decades and finally was not remembered any more by anybody but a few historians of science.

At much later dates, Halley's concept often came to be mentioned in the same breath with Sir John Leslie's, as if they were alike, or as if Leslie had simply revived Halley's ideas some three-

quarters of a century later. Actually there was a fundamental difference.

Halley had supposed three concentric spheres. Leslie simply thought that the Earth was hollow, a thick-shelled bubble, as it were. But he also thought that the hollow Earth could not be completely empty inside and he also supposed an internal miniature sun — or, rather, two of them. The two glowing bodies were supposed to move around each other as the binary stars far out in space do—the motion of the binaries had just been discovered and reported by Sir William Herschel.

Sir John Leslie even gave names to his two internal suns; classical mythology provided two that did fit well under the assumed circumstances: Pluto and Proserpina.



Marshall B. Gardner's hollow Earth, the last proposal of its kind.

A THIRD hollow Earth theorizer of about the same period was the founder of the calculus of variations and inventor of the binary logarithms, the Swiss mathematician and physicist Leonhard Euler. Euler, for whose services there was a heated competition between Frederick the Great of Prussia and Catherine the Great of Russia—both wanted him for their respective newly founded Academies of Sciences and both got him, first Catherine, then Frederick and then Catherine again—held a concept which really can be lumped with Leslie's. The only difference was that Euler supposed only one internal sun in the center, just as Halley had done.

Some thirty years after Euler's death — Leslie was still alive — the idea of a hollow Earth erupted with a great deal of noise and really became popular for a few decades, at least in America.

What happened and how it happened is comparatively easy to find out, but to say how the new prophet of an old idea, John Cleves Symmes, fitted into the sequence of hollow Earth theorizers is considerably more difficult.

He claimed repeatedly that his "theory" originated with him and

that he had the first flash of it one night when he looked at Jupiter. But on one occasion, when asked point blank whether he acknowledged the priority of Euler and Halley, he admitted that he knew of their ideas, but brushed the question aside by saying that they had taught something entirely different.

Actually, Symmes' ideas were just a modification of Halley's. Instead of three concentric spheres, Symmes had five. There was no central sun. And all five shells had large holes near their poles and each shell rotated at a different speed.

There is a rather tenuous literary thread connecting Halley and Symmes. The uncle of the theorist Captain John Cleves Symmes (he had held an Army commission and had fought with distinction in two engagements of the war of 1812) was a then well-known judge who once wrote his nephew as follows:

"In the reign of James VI of Scotland, who was the same person with James I of England, about the year 1620, a Protestant dissenting clergyman by the name of Symmes came over from England with a company of pious adventurers . . . Mr. Symmes afterward went from Plymouth with a part of the first settlers and built Charlestown, where he presided as pastor over a Presbyterian congregation. . . ."

The Symmes family, then, reached America in the form of a Protestant clergyman, and Captain Symmes once said that there had been a number of clergymen in his family. One may safely presume that they owned religious books; one such book, *The Christian Philosopher* by the famous Cotton Mather, contained an approving description of Halley's concept.

I am willing to concede that Symmes might have forgotten what he read as a boy, but Halley's idea must have stuck in his mind somehow, for their concepts are too similar to be pure accident.

FROM one point of view, Symmes was perfectly justified in dismissing Halley and Euler as predecessors. With them, the concept of a hollow Earth had been one theory among many others, and if confronted with proof to the contrary, they would probably have discarded it with small regrets. To Symmes, it was not a theory, even though he used this word: it was a credo, an overwhelming obsession which he would have been unable to shed even if somebody could have bundled him into an airplane and flown him to the poles. In the succession of hollow Earth theorizers, Symmes was the first crank.

His entrance on the public scene was peculiar enough. He mailed out five hundred printed letters, to all members of Congress, the presidents of universities and learned societies in the United States, and to a number of learned men in Europe. Attached to the letter were: (A) a printed "postscript" on a separate sheet and (B) *a certificate of sanity!* I have not been able to ascertain the wording of that certificate, but the letter and the postscript read as follows:

St. Louis, Missouri Territory
North America
April 10, A.D. 1818

To All the World:

I declare the earth is hollow and habitable within; containing a number of solid, concentrick spheres; one within the other, and it is open at the poles twelve or sixteen degrees. I pledge my life in support of this truth, and am ready to explore the hollow, if the World will support and aid me in the undertaking.

Jno. Cleves Symmes,
Of Ohio, late Captain of Infantry

P.S. I have ready for the press a treatise on the principles of matter, wherein I show proof of the above positions, account for various phenomena, and disclose Dr. Darwin's "Golden Secret."

My terms are the patronage of This and the New Worlds.

I dedicate to my wife and her ten children.

I select Dr. S. L. Mitchell, Sir H. Davy, and Baron Alexander von Humboldt as my protectors.

I ask one hundred brave companions, well equipped, to start from Siberia, in the fall season, with reindeer and sleighs, on the ice of the frozen sea; I engage we find a warm and rich land, stocked with thrifty vegetables and animals, if not men, on reaching one degree northward of latitude 82; we will return in the succeeding spring.

J. C. S.

IT GOES without saying that Dr. Mitchell, Sir Humphrey Davy and the Baron von Humboldt had no idea of the honor conferred upon them, unless they, as is likely, were on the mailing list for the letter and learned about it after the event. It also goes without saying that the promised treatise never appeared, so that the world still does not know what Dr. Erasmus Darwin's (grandfather of the famous naturalist) Golden Secret was supposed to have been.

In fact, Symmes never wrote a book about his own theory. One pamphlet about it was written by a disciple during Symmes' lifetime and Symmes himself said that he had not been properly presented. Another pamphlet was written after his death by his son Americus Vespuccius Symmes and, of course, we can't tell what his father would have said about it. What Symmes did write were a few Memoirs in succession, but they, too, were mere one-page statements, if that is the word to use.

To let my readers decide for themselves which word should or might be used, I'll quote Memoir No. II in full:

With dividers describe a circle on a plane of matter of loose texture, and in the centre add a very small circle; then draw a line through the centre. It is evident (as matter gravitates matter in proportion to quantity and distance) that either half of the inner circle, being almost equal surrounded by matter, must be a very little gravitated centrewise; so being suspended, only a rotary motion is needed to throw it compactly toward the outer circle. This being admitted, it follows that halfway from the outer to the inner side of this circle of matter so thrown out, a like rarity, suspension, or balance of gravity should prevail, and hence a disposition to concentric circles; therefore it follows that successive similar subdivisions should exist, gradually lessening in force or quantity. By applying this principle to the earth, I found the necessity of hollow concentric spheres. A decision of schoolmen on these lines should be followed by additional positions, further explaining my new principles of hollow spheres, open at the poles, declared in a circular letter of the 10th of April, 1818.

John Cleves Symmes,
of Ohio, late Captain of Infantry

The French Academy, after reading the communications and presumably after making certain that their difficulties were not merely linguistic, produced some choice expressions of ridicule. Symmes was deeply hurt, because he apparently had been convinced that one of the members of the Academy would applaud him.

This member was Pierre Simon, the Marquis de Laplace. The reason: Laplace had published his own ideas about the poles. Condensed, they amounted to about this: The Earth has an equatorial bulge, caused by its rotation. The formation of the equatorial bulge may well have been accompanied by the formation of polar depressions, so that explorers, once they got that far, should find warm and ice-free polar seas, warmed by the internal heat of the Earth.

TO Symmes' mind, this had been a step in the right direction and he felt that Laplace had just not gone far enough. Since Symmes had gone further, Laplace was supposed to applaud — but Laplace did not want to go any further.

Because Symmes' teachings have to be reconstructed from endless interviews he gave to newspaper reporters, from reports about his many lectures and from letters he wrote to the editors, there is no way of arriving at a definite picture. The figures he gave were not always the same and crucial points often are not mentioned.

At any event, the outermost Earth shell had a thickness of about 1000 miles. The circular opening — popularly called "Symmes Hole" — in the north had a diameter of about 2000 miles; the one in the south was somewhat larger. The rims of these openings — Symmes called them "verges" — were open seas, beyond the "icy hoops" that had

been insufficiently penetrated by explorers and whalers.

While the verges were perfectly circular, they were not centered on the poles. The axis of rotation formed an angle of between 12 and 14 degrees with the center line of the verges. What the relative positions of axis of rotation and of the verges of the inner shells were supposed to be was not made clear. Symmes' son later assumed that all verges were lined up along the same center line.

All these shells were "habitable without and within upon my word of honor" and, in addition to all this surface space, there was more room by far because in the stony shell were numerous and enormous caves with a native life of their own. This assertion was made mostly about the outermost shell. I don't know whether there were big caves in the inner shells, too.

As for the southern verge, some ships must have come close to it, for their captains and crews had seen the light reflected from the icy hoop across the verge. They had called them the Magellanic Clouds. In the north, the verge was highest in latitude to the north of Europe, but the Svalbard Archipelago was close to it. Its northermost island, now called Northeast Land, might possibly be in the verge. This position necessitated that the verge ate a considerable chunk out of northern Siberia, which was practically unknown at the time.

Symmes, while conducting his lecture tours like a political campaign, petitioned Congress twice for an expedition to the verge, starting off from the West Coast and working its way up to Siberia. Congress managed to bury both petitions — their dates were 1822 and 1823 — by means of tricks with which Congressmen have a lot of experience.

The French Academy stood firm.

But the Russians actually nibbled at the bait.

SYMMES claimed to have received a personal letter from the Czar, which is unlikely, but there *was* correspondence with the Czar's representatives. The Russians, remember, owned all of Siberia *and* Alaska, but very little was known about this territory It was considered an accomplishment to know that there was no land bridge between Siberia and Alaska.

The Czar's government had been toying with the idea of a more thorough exploration of Siberia all along. If this exploration might open a gateway to the Inner World, they were ready — or at least willing — to find out and annex what could be found.

Symmes was invited to come to Russia and assist in organizing the expedition. It was taken for granted that he would go along as one of the leaders, in 1827. He declined because of poor health. Two years later, on May 29, 1829, he died at the age of not quite 49 years.

Although the newspapers had been quite excited about his theory and the public had flocked to his lectures, Symmes apparently had had mainly nothing more than curiosity value even to his admirers. Soon after his death, it was all over. A few major articles in magazines — Harper's for example — appeared later, but were considered "historical articles" by the readers. They did not influence anybody.

However, hollow Earth ideas, now solidly in the hands of cranks, still persisted. During the latter part of the nineteenth century, one Cyrus Reed Teed, writing mostly under the name of Koresh, was the first to anticipate Herr Neupert. Teed also said that we live on the inside of the Earth, but he was far less definite about astronomical facts to be explained away than Neupert at a later date.

In 1868, one W. F. Lyons, who called himself Professor, published a book with the title *A Hollow Globe*, which was simply a copy of Symmes, who, however, was not even mentioned. "Professor" Lyons, if somebody questioned him about that oversight, probably replied that his theory was entirely different — he did not have any additional hollow spheres inside the Earth.

IN fiction, the hollow Earth idea has been given a quite thorough workout. The earliest, written during Symmes' lifetime, was a satirical treatment called *The Journal of Capt. Adam Seaborn: Symzonia,* published in 1822. As you'll notice, Symmes' name is worked into the title.

But from that point on, though the number of books increases considerably, he gets less mention. For example, Poe's *The Narrative of Arthur Gordon Pym* (about 1850) merely is similar to the good captain's name.

Then comes Verne's *The Voyage to the Center of the Earth* (1864). In 1892, William R. Bradshaw's *The Goddess of Atvatabar/Being the History of the Discovery of the Interior World* created a bit of a stir.

Science fiction readers are most familiar, of course, with the Pellucidar series of Edgar Rice Burroughs, which began in 1922 with *At the Earth's Core.*

Those are the outstanding items. There have been others and undoubtedly there will be more, even though the concept has been

so wholly exploded. Ideas die hard, you know, and false ones often appear to be especially enduring.

The Marshall B. Gardner who was mentioned earlier in the article was really the latest and presumably last of the proponents of a hollow Earth of what might be called the "classical" type. In 1914, he published a small volume with the title *A Journey to the Earth's Interior, Or, Have the Poles Really Been Discovered?* His model of the hollow Earth was almost precisely that of Euler, a thick shell with a miniature sun in the center, but with two verges concentric to the poles added.

Gardner's argument was that there was still some doubt that anybody had actually reached the poles and that the explorers themselves would be bound to be confused, since they did not expect to find themselves in a verge. The aurora was explained by Gardner as the reflection of the light from the inner sun, shining through the verge, on the outer atmosphere.

A second and much enlarged edition of the book appeared in 1920. Gardner rejected with utter indignation any comparison between his idea and "Symmes' nonsense." Reading his book is a strange experience; it is full of the most obvious flaws in logic and the most amateurish misinterpretation of scientific facts taken from books of popular science. Coupled with this is an obvious desire for absolute honesty — in pursuit of falsity.

Well, the poles now are discovered and at least one airline is flying commercially over the area where Laplace expected a large depression and a warm sea and where others dreamed of verges opening a pathway to a fabulous inner world.

—WILLY LEY