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PAUL COLLINS

WAKING ON THE RINGS OF SATURN

Life on the moon!

It seemed too good to be true—and so it was, in the end. But for a few weeks in 1835, it was as real as the newspaper gripped between every American's hands. Readers could thank journalist Richard Locke for the bizarre account of lunar life; but for the even more bizarre thoughts behind them, they had to turn to a shy, self-taught astronomer from Scotland.

Thomas Dick was not born into the contemplative life. In 1774, science was still a gentleman's profession, well out of reach of the likes of Dick's father, a weaver. But the son of this humble weaver had a revelation in 1782, at the age of eight, when he saw a meteorite flash before him in the evening sky. Soon he was spending his workdays at the loom reading borrowed books on astronomy; at night, he ground his own lenses and constructed crude telescopes with paste board tubes. He fell among academics and spent much of his early life teaching, preaching, and promoting, in his words, "literary and philosophical societies adapted to the middling and lower ranks of society." His youthful interest in astronomy was never lost in all this activity; to the contrary, it became the centerpiece of his lifelong obsession with marrying religion and science. To Dick, the heavens were God's work made visible on a vast scale to earthly inhabitants.

With successful teaching and writing stints behind him, Dick decided at the age of fifty-three to devote himself fully to his lifelong passion. He quit teaching and went to work building a small cottage on a hill near Dundee and fitting it with a library and observatory of his own design. He was by nature a reserved and rather sober man, and the remote perch suited him just fine. By night, he watched the skies, having long since graduated from his apprenticeship of homemade lenses and pasteboard tubes. By day, he wrote books—great masses of them—expounding upon education, prison reform, fire safety, preaching, and most of all astronomy.

He was tremendously popular in the United Kingdom and in the United States, and such luminaries as Emerson, Harriet Beecher Stowe, and William Lloyd Garrison all made pilgrimages to meet him. His massive following came in part because he could write on scientific discoveries for the common man in a way that his learned colleagues never could. But clarity alone doesn't explain his wide popularity. Dick had captured the public imagination with his belief that every single planet, moon, comet, and star was inhabited with intelligent beings. And what was more, he had a fair idea of how to reach them.

WHILE WALKING ACROSS a field, you find a watch on the ground. All the minerals in the earth couldn't have combined together to form a watch on their own; surely this watch must have a watchmaker. Walking farther, you kick up a chunk of quartz. Examined closely, it reveals a fantastic crystalline structure. You assumed the carefully designed watch had a maker; why not the chunk of quartz?

This was the opening argument of William Paley's 1802 work Natural Theology, which lent its name to the entire field that arose in its wake. Though these ideas had been bubbling for some time, it was Paley who spread natural theology to the intelligentsia.

To a natural theologian, the wisdom and moral perfection of God were evidenced in the compact design and utility of every natural object. Today we might see giraffes as the evolutionary survivor of merciless natural selection, winning over dead-end mutations by virtue of being able to eat lofty edible leaves. But to a natural theologian, a giraffe was evidence of God's kindly hand—creating a plain with high trees, He provided for giraffe welfare by giving their necks a good stretch.

The movement came to a head in the 1830s, when the Cambridge don William Whewell published his Bridgewater Treatise, which allowed and even encouraged the belief that a benevolent God would populate other worlds with beings intelligent enough to appreciate the beauty of His creations. This idea also had some currency in the seventeenth century: the theologian Giordano Bruno was burned at the stake for it in 1600, and both the English bishop John Wilkins and the French scientist Bernard le Bovier de Fontenelle advocated it later that century. Now, though, it was to be revived dramatically by Whewell and fellow scientists like Sir David Brewster. But it was Dick, the humble Scottish astronomer, who went farther than anyone else dared to imagine.

TO DICK, THE massive workings of the skies were a means to a magnificent and inscrutable end. For it to be otherwise, a means without an end, would reveal our Maker to be a cruel existentialist. The universe would be, as his book The Sidereal Heavens claims, "one wide scene of dreariness, desolation, horror, and silence, which would fill a spectator from this world with terror and dismay. .. without one sentient being to cheer the horrors of the scene." This was clearly unacceptable in a Christian god, as was the "wild hallucination" that our own life was an accident of primordial chemistry. We did not exist as a result of fortunate material reactions—it existed to please us, a conceit now known as the Anthropic Principle. "Matter, " Dick insisted, "was evidently framed for the purpose of mind."

It also followed that having matter anywhere without a sentient being for it to serve would be pointless. Therefore every celestial body must be inhabited. Intelligent life was more than a mere accident of our planet, or of perhaps one or two others: it was the natural state of the universe. To believe otherwise was "impious, blasphemous, and absurd." Writings like Celestial Scenery are thunderous on this point: "Let us suppose

for a moment that the vast regions on the surfaces of the planets are only immense and frightful deserts, devoid of inhabitants— wherein does the wisdom of the Creator appear in the supposition? Would this be an end worthy of INFINITE WISDOM?"

With every world being inhabited, it was natural enough for Dick to first turn his attentions to the moon. By Dick's estimate, if the moon was as crowded as England it would have a population of 4.2 billion. And with every order of life inhabiting every world, he went on in The Sidereal Heavens to use this formula to calculate the population of the visible universe:

There would be the following number of inhabitants in these worlds, 60,573,000,000,000,000,000,000; that is, sixty quartillions, five hundred and seventy three thousand trillions, a number which transcends human conception. Among such a number of beings, what a variety of orders may exist, from the archangel and the seraph to the worm and the microscopic animaliculum!

But there is no explanation, sadly, of why a benevolent God would want to make every planet as crowded as England.

Given the magnificent intricacy of virtually any object, Dick's thinking naturally led him to believe that every celestial object was inhabited, including comets and asteroids. "Comets may be the abodes of greater happiness than is to be found on our sublunary world," he marveled, "and may be peopled with intelligences of a higher order than the race of man." These comets might be peopled with rather worldly fellows (or rather, cometary fellows), made wise and sophisticated by the vaster and more diverse prospects afforded to them in their long, irregular orbits inside the solar system. He imagined that they might be a race of astronomers, sailing through space in their icy observatory, in eternal contemplation of the planets: "Their movable observatory, cruising from sun to sun, carries them in succession through every different point of view." With keen enough eyes, perhaps these cometary beings could spy upon a whole other order of beings together—the ones, Dick proclaimed, that lived in the interior of the sun.

Dick also believed the rings of Saturn to be solid, in the mistaken belief that mere dust debris would have already been flung into space. Given their solidity, and the sublime views of the planet surface below and the heavens above, Dick thought that surely these rings must be populated with "numerous orders of intellectual beings."

These intelligent neighbors were not invulnerable, though. In Dick's time, the asteroid belt between Mars and Jupiter was still a relatively new discovery, and some hazarded the guess that it might be the remains of a planet. In Dick's thinking—since all planets were inhabited—this cataclysm becomes a celestial Sodom: "The fate of the beings that inhabited the original planet must have been involved in the awful catastrophe. . . . Nor should we consider it inconsistent with what we know of the physical

government of the Almighty." Some scientists—then, as now—fretted over the possibility of a comet smashing into the earth and snuffing out the human race. But however vengeful this planet-smashing God was, Dick could not imagine that this was the common moral state of the universe:

The benevolent Father of all did not intend that this moral derangement should be universal and perpetual. ... If a world which has been partly deranged by the sin of its inhabitants abounds with so many pleasures, what numerous sources of happiness must abound, and what ecstatic joys must be felt in those worlds where mortal evil has never entered, where diseases and death are unknown.

A good God meant that most, and maybe all, other worlds were still in a state of innocence. Perhaps, then, it was just as well that we couldn't corrupt them through human contact—a notion that has enjoyed currency among science fiction writers ever since.

In fact, Dick thought that alien intellects and morals might be far more advanced than ours. The distant and irregular motion of the outer planets would demand a superhuman mind in order to make the astronomical observations needed to appreciate God's celestial workings. Comets swooped in irregular orbits, while the inhabitants of the rings of Saturn lived on multiple rings that (by his guess) all moved at confusingly different speeds:

Intelligent minds exist in the regions of Jupiter, Saturn, and Uranus. . . . Those minds, in all probability, are endowed with faculties superior in intellectual energy and acumen to those of our globe. For the rapidity and complexity of the [planetary] motion . . . require the exertion of [superhuman] intellectual faculties.

And any lunar astronomers had to surmount their initially lunarcentric view of the universe to realize that their role was twice diminished: that is, they were circling another world that was itself circling a sun. But our moon's astronomers, favored with long nights and a thin atmosphere—for Dick refused to believe that the moon lacked any air at all—could at least take solace in crystal-clear views of their earthly brethren.

Better still, he hinted, perhaps these Lunarians didn't even need telescopes to do this. Although our weak earthly eyes might not be able to view them with the most powerful instruments, aliens might have eyes that could spy upon us unaided. Dick's mind also ranged to imagining how the night might look on other planets: "The most splendid object in the nocturnal sky of Venus will be the earth. . . . Our moon will likewise be seen from Mars like a small star accompanying the earth." In fact, Dick could scarcely conceive of blind or dim-eyed aliens. What else is the universe for, he asked, but contemplation by its inhabitants?

All these speculations on interplanetary vistas were easy enough to consider in the

abstract, but Dick popularized a grander earthly plan. Reasoning that all alien intelligences spoke the universal language of geometry, in Celestial Scenery he proposed the construction of a gigantic geometrical figure on the plains of Siberia:

A correspondence with the inhabitants of the moon could only be begun by means of such mathematical contemplations and ideas which we and they must have in common. They might perhaps erect a similar one in reply. Schemes far more foolish and preposterous than the above have been contrived and acted upon in every age of the world. The millions which are now wasting in the pursuits of mad ambition and destructive warfare might, with far greater propriety, be expended in constructing a huge triangle or ellipsis of many miles in extent, in Siberia or any other country.

For many readers, Celestial Scenery was their first exposure to this breathtakingly ambitious notion. But variations on this idea—using a giant array of mirrors in Siberia, say, or filling a giant square Saharan trench with kerosene and setting it alight—had been floating around for a couple of decades among similar-minded cosmologists. On a slightly more practical note, Dick envisioned a worldwide corps of thousands of astronomers, each allocated a particular part of the moon to survey for years, all in order to detect any long-term changes in vegetation or topography, either of which might indicate the urban handiwork of an intelligent race.

Even in his era, long before radio, Dick imagined that humans might contrive some better means of reaching out into the ether. "Man is only in the infancy of his being," he mused, for he knew that his monumental proposals were also monumentally unwieldy means of interplanetary communication:

We may conceive that intellectual beings, to whatever portion of the material world they originally belonged, may hold the most intimate converse with one another, by modes peculiar to their economy, and which are beyond the conceptions of the physical universe; so that distance in point of space shall form no insuperable barrier to the mutual communication of sentiments and emotions.

For a few months in 1835, it seemed that Dick's celestial vision might come true.

IT BEGAN QUIETLY enough. On August 21, 1835, the New York Sun reported that astronomer Sir John Herschel "has made some astronomical discoveries of the most wonderful description, by means of an immense telescope." Hyperbole was common to newspapers of the time, so this announcement could have meant almost anything. What it did mean was revealed a day later: in South Africa, the ingenious Herschel had built a telescope so powerful that when the cap was left off during the day, it melted the plaster walls into blue glass, burned a hole through the observatory, and then set fire to a nearby grove of trees. This insanely powerful telescope could magnify objects by an unheard-of 42,000 times, and was promptly turned at the moon the next night to reveal... a field of poppies.

As if in an opium dream, the magical images unfolded:

A beach of brilliant sand, girt with wild castellated rocks, apparently of green marble . . . with grotesque blocks of gypsum, and festooned at the summit with the clustering foliage of unknown trees. We were speechless with admiration . . . [Later we saw pyramids] of monstrous amethysts, of a diluted claret color, glowing in the intensest light of the sun!

If Sun readers were stunned by the news, so were the newsagents: the issue sold out, and printers scrambled to keep up with demand for it and the following issue. The Sun had scooped every other paper in the country by obtaining the latest copy of the Edinburgh Journal of Sciences, which apparently held Dr. Andrew Grant's account of the lunar discoveries. Unable to procure a copy for themselves, competing papers immediately reprinted the story. But even they couldn't have anticipated the next electrifying revelation: animal life.

The dawn of August 25 saw New Yorkers sitting down and rubbing their eyes in disbelief. Herschel had discovered herds of small bison living on the moon. What was more, there was a menagerie of bizarre lunar animals that almost defied earthly description:

The next animal perceived would be classed on earth as a monster. It was of a bluish lead color, about the size of a goat, with a head and beard like him, and a single horn, slightly inclined forward from the perpendicular. The female was destitute of horn and beard, but had a much longer tail. It was gregarious, and chiefly abounded on the acclivitous glades of the woods. In elegance of symmetry it rivaled the antelope, and like him it seemed an agile sprightly creature, running with great speed, and springing from the green turf with all the unaccountable antics of a young lamb or kitten.

Looking farther across the lunar plains, they saw palm trees, islands of shimmering quartz, and herds of miniature reindeer, elk, and zebra. Animals ranged in size from mice to a bear with horns, and included—most startlingly—the biped beaver. As tall as humans, the beavers walked upright, skating gracefully among their villages of tall huts, which all had chimneys, showing them to be acquainted with the use of fire.

As my more adept readers may have already guessed, there was something missing from this fantastic narrative—an elusive quality that we might call reality. For the source of these articles was not Dr. Andrew Grant, but a gang of merry hoaxers at the New York Sun led by a certain Richard Adams Locke.

LOCKE WAS A brash young British expatriate, a descendant of the philosopher John Locke, and his schooling at Cambridge in the 1820s would have placed him in a hotbed of natural theology. The phenomenon of Dick and his ilk, whose works were being

reprinted and parroted in American periodicals, was just too tempting for Locke to pass up. The 1820s had already brought at least two clumsily executed claims of life on the moon. With his university training, though, Locke was able to imitate his instructors' rhetoric with perfect pitch.

Like any good hoax, Locke's began from reasonable-sounding premises. Dick's and Whewell's writings had already made alien life a plausible and maybe inevitable discovery. Herschel was a respected member of a famous family of astronomers, and he had in fact recently set up shop in South Africa. Still, for all their savvy, neither Locke nor Sun publisher Moses Beach (the father of future Scientific American publisher Alfred Beach) could have predicted the sensational nationwide impact of their "discovery." The circulation of the New York Sun leaped fivefold overnight, and Locke's articles were reprinted by newspapers across the country. Fellow journalists clamored for more details, and enthusiastic astronomers besieged ticket agents to book passages to South Africa. To top this media mayhem would be a challenge indeed—but Locke did not disappoint.

ON AUGUST 28, the Sun reported the biggest scoop in the history of journalism: there were people on the moon. Or rather... a sort of people:

They averaged four feet in height, were covered, except on the face, with short and glossy copper-colored hair, and had wings composed of a thin membrane. ... In general symmetry of body and limbs they were infinitely superior to the orang outang. . . . Some of these creatures had crossed this water and were lying like spread eagles on the skirts of the wood. We could then perceive that they possessed wings of great expansion, and were similar in structure to those of the bat. . . . We scientifically denominated them as Vespertilio-homo, or man-bat; and they are doubtless innocent and happy creatures, notwithstanding that some of their amusements would but ill comport with our terrestrial notions of decorum.

These man-bats lived in a land of towering sapphire pyramids and were accompanied by flocks of doves. In their more relaxed moments, they could be seen picnicking on cucumbers.

Locke now had the nation's ear. In a time when many lands were as yet unmapped, such fantastic claims about another planet could be easily accepted. The New York Times even pronounced the claims to be "probable and possible." But really, we might ask, could Locke's fellow journalists have been that gullible?- This comment from the New York Evening Post stands on its own as a reply:

That there should be winged people in the Moon does not strike us as more wonderful than the existence of such a race of beings on Earth . . . [such as described by] Peter Wilkins. whose celebrated work not only gives an account of the general appearance of habits of a most interesting tribe of flying Indians, but also of all those more delicate

and engaging traits which the author [Wilkins] was enabled to discover by reason of the conjugal relations he entered into with one of the females of the winged tribe.

Not surprisingly, at this point—if not well before—it dawned on Locke and Beach that all this attention could be worth a good deal of money. Following the distinct smell of lucre in the air. they set about printing up the articles in book form. The first printing of Great Astronomical Discoveries Lately Made by Sir John Herscbel at the Cape of Good Hope quickly sold out its run of sixty thousand copies: pirated editions rushed in to rill the void. Lithograph portraits of Lunarian creatures were sold to enthusiastic lunaphiliacs. The public couldn't get enough of it: congregations began taking up collections for missionaries to preach gospel to the man-bat race, and scalpers sold copies of the coveted book for tidy sums of cash.

Inevitably. Locke's time ran out. Astronomers seeking copies of his sources met with increasingly evasive replies, and they began to set suspicious. Arriving ships showed no sign of the famous article by Dr. Grant in the Edinburgh Journal of Sciences. But in the end, vanity did the hoax in. Unable to contain himself, the star journalist revealed his grand prank to a colleague at the Journal of Commerce. He had fooled the whole nation!—and. of course, the friend was sworn to utter secrecy.

Locke awoke the next day to screaming headlines. And so on September 16—its chutzpah intact, if not its credibility—the New York Sun admitted to the hoax, but excused it on the outrageous grounds that it had performed a public service by "diverting the public mind, for a while, from the bitter apple of discord, the abolition of slavery." But if the Sun couldn't be bothered to come up with a better excuse, perhaps it was because Locke and Beach were too busy counting the small fortune they'd made off the whole absurd affair.

DICK WAS UNAMUSED. In a footnote to Celestial Scenery he huffs:

The author of this deception, I understand, is a young man in the city of New York, who makes some professions as to scientific acquirements, and he may be perhaps disposed to congratulate himself. . . . The Law of Truth ought never for a moment to be sported with. . . . For when untutored minds and the mass of the community detect such an imposition, they are apt to call in question the real discoveries of science. ... It is to be hoped that the author of the deception to which I have adverted, as he advances in years and in wisdom, will perceive the folly and immorality of such conduct.

It was a fatherly wheeze worthy of Polonius, but Dick needn't have bothered. Locke merrily hoaxed gullible suckers well into his golden years.

And they were suckers, as even Dick was to admit. Any half-educated reader should have realized that a supposed telescope with a magnification of 42,000X would make

the moon, a quarter million miles distant, appear about six miles away. "To perceive such objects [as animals]," Dick commented wryly, "it was requisite that they should have been brought within six yards instead of six miles."

Edgar Allan Poe, on the other hand, was quite tickled by the whole affair. Writing in the October 1846 issue of Godey's Lady's Book, Poe thanked Locke for having whipped up a sales frenzy that ended up financing most of New York's penny newspaper presses. Poe was no stranger to successful hoaxes, as he had at least three to his credit—his own "Hans Pfall" moon hoax, the bizarre suspended animation of "M. Valdemar," and the past-lives scam of "Mesmeric Revelation." Poe, often quick to accuse competitors of plagiarism, was warm in his praise of Locke.

Nonetheless, for a few years after the lunar hoax, Dick's ideas were quoted in popular periodicals of the day, and they gained a wider (if distorted) circulation through Locke's spoof. He also made his way anonymously into the hands of many unsuspecting readers. As I write, I have before me an 1846 chapbook of Dick's The Solar System. It was published in America by the American Sunday-School Union, one of a countless number of tract societies that flooded the American frontier and the British countryside with edifying books on science, theology, and treacly moral tales. Dick's name doesn't appear anywhere on it. Nor does it have any hint of Dick's far-out cosmology: to look at it, you'd think it was nothing more than a nice little guide to the planets put out by a nice little church press. We can only imagine some grizzled dirt farmer in Nebraska scratching his beard as he set his copy down, pondering the building of a Siberian monument to communicate with Lunarians.

Amusingly enough—though not for Thomas Dick, had he lived to see it—Locke's hoax stayed in print longer than the work it spoofed. Dick went out of print not long after his death in 1857, while Locke's Great Astronomical Discoveries outlasted Locke himself, with a fifth edition in 1871, the same year that he died.

SO WHY DID Dick's works go out of print first? For one thing, Dick's narrative became almost less credible than Locke's. Presented with evidence that didn't accord with his notion of a wise and kindly God, Dick would reject it out of hand. For example, an apparent glow on the moon had been attributed by some colleagues to lunar volcanoes. Impossible, Dick declared: volcanoes were the result of our fall from grace, and the presence of "such appalling and destructive agents . . . would be to virtually admit that the inhabitants of that planet are in the same depraved condition as the inhabitants of this world." He reacted the same way to correct evidence of screamingly high wind speeds on Jupiter. Such observations, he sniffed, simply showed our ignorance of the planet's indubitably pleasant weather: "A West India hurricane, blowing at the rate of a hundred miles an hour, has blown heavy cannon out of a battery. . .. What, then, would be the force of a gale moving at the rate of a thousand miles per hour? [It is] altogether inconsistent with the idea of a comfortable habitation either for sensitive or intellectual beings."

Natural theology's ensuing death was slow and painful. Its vulnerability lay in its ultimate allegiance to scripture, rather than to scientific methodology. When scripture didn't accord with scientific fact, the resulting reinterpretation of scripture took it farther and farther away from a literal reading of the Bible, and farther out of the grasp of popular understanding. After 1850, in the first glimmerings of evolutionary biology and quantum physics, the link became so tenuous that one may as well be speaking of two different subjects entirely: nature, and theology. Most people did, and so came the end of natural theology.

The only other easy option, an admission that scripture might be wrong, was dismissed out of hand by theorists like Whewell: "The results of true geology and astronomy cannot be inconsistent with the statement of true theology." Whewell himself declined in his later years into ineffectual and pathetic attempts to have copies of Darwin removed from his college library.

Dick was spared from these sights; when he died in 1857, the first drops of Darwinism had not yet eroded public belief. Posterity has been less kind to him, though: his once-popular tracts are difficult to find, and have been entirely out of print for well over a century. The 1855 edition of his complete works that I found at UCLA still had uncut pages.

As far as I could tell, I was the first person in 143 years to even open it.