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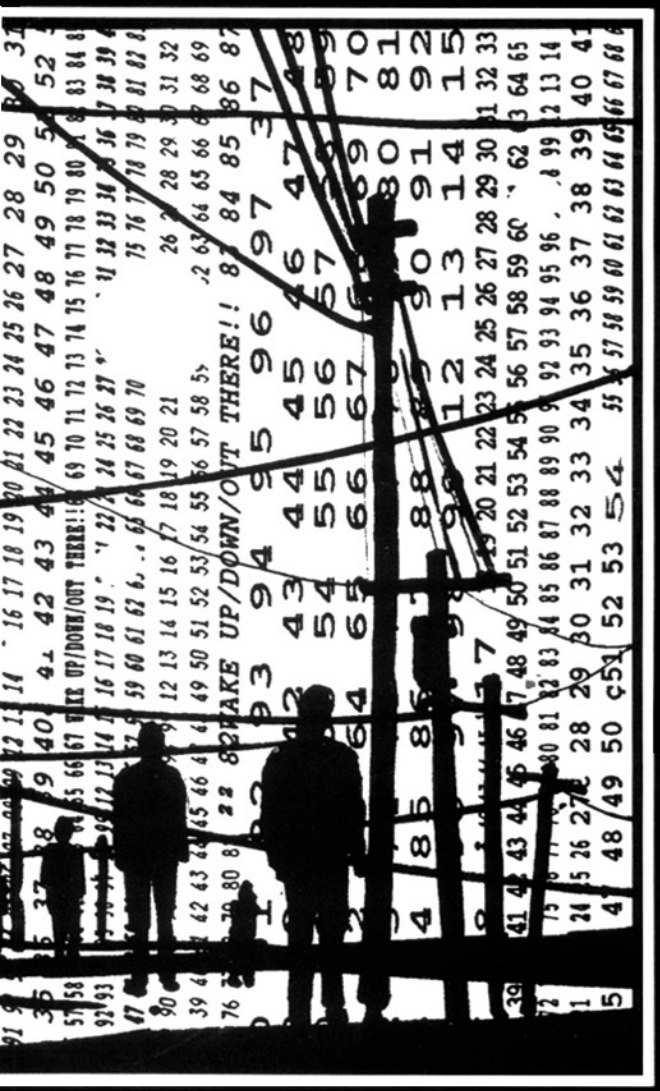

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THE ANOMALIST

Edited and published
by Patrick Huyghe and Dennis Stacy

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QUADRATIC EQUATIONS

There is more mystery than knowledge in the world."Mystery surrounds us," writes the naturalist Chet Raymo in *Honey from Stone*. "It laps at our shores. It permeates the land. Scratch the surface of knowledge and mystery bubbles up like a spring. And occasionally...a tempest of mystery comes rolling in from the sea and overwhelms our efforts..."

But while the mass media and the scholarly press cover "knowledge" adequately,"mystery" is by and large ignored. There is not only an avoidance of things we do not know, but those who profess an interest in the unknown are often the subject of ridicule. Somehow that attitude seems very wrong to us: it is, in fact, just the opposite of what we feel the quest for knowledge really is. Mystery is our prime subject and those who are brave enough to tackle it we regard as the true pioneers.

By mystery, of course, we rnean the anomalous. And by the anomalous we mean simply that which "departs from the common; not conforming to what is usual; irregular." This definition of the anomalous is intended to be as broad as possible by design. The definiton is cerainly not meant to be limited to "popular" anomalies such as UFOs, the Loch Ness Monster, ESP, or Bigfoot, though it is hardly meant to eliminate them from consideration either. We will be dealing with a whole host of astronomical, biological, geological, psychological, physical, geophysical, linguistic, religious, and archeological phenomena.

No one really knows where one mystery ends and another begins, where one boundary or category begins, ends or merges with another. Or for that matter, whether the whole notion of boundaries is applicable to the issue at hand. One measures a circle, after all, beginning anywhere. That is why we are not The Ufologist, or The Parapsychologist, or The Cryptozoologist, or some other Mystery-ologist. That is why we are The Anomalist. What we are trying to do is explore and, perhaps, solve for several unknowns at once.

That, in essence, is the reason for The Anomalist. It is, to be quite honest, a product borne of frustration. We are tired of the lack of courage, the lack of wonder, and the lack of curiousity that often passes for scholarship. We intend to make this publication a serious yet entertaining showcase for presentations of enigmatic data and radical ideas of all kinds.

But be forewarned. Though we hope to serve as a voice for anomalies, we will not shield any subject from justified criticism. We are not believers. We are not skeptics. We are writers, investigators, and scientists looking for the truth--whatever that may be. And though we are not without preconceptions we will try to be upfront about them.

We are interested in investigating all layers of reality with a particular fondness for those subjects lying on the shadowy margins of the scientific world. At times we may even be critical of science, for its ostrich-like stance in the presence of the mountain of anomalies it tends to disregard, but we are by no means anti-science. On the contrary, we would argue that no subject should be beyond the realm of science.

We wish to open the doors and place a crowbar across the transom. And through these doors will come a parade of the neglected, the unexplained, the unexpected, the extraordinary, and, of course, the damned.

Welcome. *Patrick Huyghe and Dennis Stacy*

DINOSAURS

and the Gravity Problem

by Ted Holden

Scientists delight in devising explanations for the great dinosaur extinctions. But there are several questions which they have failed to even ask, much less tried to answer. Why, for instance, in all of the time claimed to have passed since the dinosaur extinctions, has nothing ever re-evolved to the sizes of the large dinosaurs? If such sizes worked for creatures which ruled the Earth for tens of millions of years, then why would not some species of elephant or rhinoceros have evolved to such a size again? What kinds of problems, if any, would sauropod sizes entail in our world as it is presently constituted? Could it be that some aspect of our environment might have to be massively different for such creatures to exist at all? A careful study of the sizes of these antediluvian creatures, and what it would take to deal with such sizes in our world, has led me to believe that the super animals of Earth's past could not live in our present world at all.

A look at sauropod dinosaurs as we know them today requires that we relegate the brontosaur, once thought to be one of the largest sauropods, to welterweight or at most middleweight status. Fossils found in the 1970's now dwarf this creature. Both the brachiosaur and the supersaur were larger than the brontosaur, and the ultrasaur appears to have dwarfed them all.[1] The ultrasaur is now estimated to have weighed 180 tons.[2]

A comparison of dinosaur lifting requirements to human lifting capabilities is enlightening, though there might be objections to doing so. One objection that might be raised is that animal muscle tissue was somehow "better" than that of humans. This, however, is known not to be the case. According to Knut Schmidt-Nielson, author of *Scaling: Why is Animal Size So Important?*, the maximum stress or

force that can be exerted by any muscle is independent of body-size and is the same for mouse or elephant muscle.[3]

Another objection might be that sauropods were aquatic creatures. But nobody believes that anymore; they had no adaptation for aquatic life, their teeth show wear and tear which does not come from eating soft aquatic vegetation, and trackways show them walking on land with no difficulty.

A final objection might be that dinosaurs were somehow more "efficient" than top human athletes. This, however, goes against all observed data. As creatures get bulkier, they become less efficient; the layers of thick muscle in limbs begin to get in each other's way and bind to some extent. For this reason, scaled lifts for the super-heavyweight athletes are somewhat lower than for, say, the 200-pound athletes. By "scaled lift" I mean a lift record divided by the two-thirds power of the athlete's body weight.

As creatures get larger, weight, which is proportional to volume, goes up in proportion to the cube of the increase in dimension. Strength, on the other hand, is known to be roughly proportional to the cross-section of muscle for any particular limb and goes up in proportion to the square of the increase in dimension. This is the familiar "square-cube" problem.[4]

Consider the case of Bill Kazmaier, the king of the power lifters in the 1970s and 1980s. Power lifters are, in my estimation, the strongest of all athletes; they concentrate on the three most difficult total-body lifts, i.e. bench press, squat, and dead-lift. They work out many hours a day and, it is fairly common knowledge, use food to flavor their anabolic steroids. No animal the same weight as one of these men could be presumed to be as strong. Kazmaier was able to do squats and dead lifts with weights between 1,000 and 1,100 pounds on a bar, assuming he was fully warmed up.

Standing Up at 70,000 pounds

Any animal has to be able to lift its own weight off the ground, i.e. stand up, with no more difficulty than Kazmaier experiences doing a 1,000-pound squat. Consider, however, what would

happen to Mr. Kazmaier, were he to be scaled up to 70,000 pounds, the weight commonly given for the brontosaur. Kazmaier's maximum effort at standing, fully warmed up, assuming the 1,000 pound squat, was 1,340 pounds (1,000 pounds for the bar and 340 pounds for himself). The scaled maximum lift would be 47,558 pounds (the solution to: $1{,}340/340^{.667} = x/70{,}000^{.667}$). Clearly, he would not be able to lift his weight off the ground!

A sauropod dinosaur had four legs you might say; so what happens if Mr. Kazmaier uses arms *and* legs at 70,000 pounds? The truth is that the squat uses almost every muscle in the athlete's body very nearly to the limits, but in this case, it does not even matter. A near maximum bench press effort for Mr. Kazmaier would fall around 600 pounds. This merely changes the 1,340 pounds to 1,940 pounds in the equation above, and the answer comes out as 68,853 pounds. Even using all muscles, some more than once, the strongest man who we know anything about would not be able to lift his own weight off the ground at 70,000 pounds.

To believe then, that a brontosaur could stand at 70,000 pounds, one has to believe that a creature whose weight was mostly gut and the vast digestive mechanism involved in processing huge amounts of low-value foodstuffs was, somehow, stronger than an almost entirely muscular creature its size, far better trained and conditioned than any grazing animal. That is not only ludicrous in the case of the brontosaur, but the calculations only become more absurd when you try to scale up to the supersaur and ultrasaur at their sizes.

How heavy can an animal get to be in our world, then? How heavy would Mr. Kazmaier be at the point at which the square-cube problem made it as difficult for him to stand up as it is for him to do 1,000-pound squats at his present weight of 340 pounds? The answer is 20,803 pounds (the solution to: $1{,}340/340^{.667} = x/x^{.667}$). In reality, elephants do not appear to get quite to that point. Christopher McGowan, curator of vertebrate paleontology at the Royal Ontario Museum, claims that a Toronto Zoo specimen was the largest in North America at 14,300 pounds,[5] and Smithsonian personnel once informed me that the gigantic bush elephant specimen which appears at their Museum of Natural History weighed around 8 tons.

Sauropod Dinosaurs' Necks

A study of the sauropod dinosaurs' long neck further underscores the problem these creatures would have living under current gravitational conditions. Scientists who study sauropod dinosaurs now claim that they held their heads low, because they could not have gotten blood to their brains had they held them high.[6] McGowan mentions the fact that a giraffe's blood pressure – which at 200-to-300 mm Hg (millimeters of mercury) is far higher than that of any other animal– would probably rupture the vascular system of any other animal. The giraffe's blood pressure is maintained by thick arterial walls and by a very tight skin that apparently acts like a jet pilot's pressure suit. A giraffe's head might reach to 20 feet.

How a sauropod might have gotten blood to its brain at 50 or 60 feet is the real question."Gravity is a pervasive force in the environment and has dramatically shaped the evolution of plants and animals," notes Harvey Lillywhite, a zoologist at the University of Florida at Gainesville. As some land animals evolved large body sizes, "cardiovascular specializations were needed to help them withstand the weight of blood in long vertical vessels. Perhaps nowhere in the history of life were these challenges greater than among the gigantic, long-necked sauropods" For a *Barosaurus* to hold its head high, Lillywhite has calculated that its heart "must have generated pressures at least six times greater than those of humans and three to four times greater than those of giraffes."[7]

Faced with the same dilemma, University of Pennsylvania geologist Peter Dodson remarked that while the *Brachiosaurus* was built like a giraffe and may have fed like one, most sauropods were built quite differently."At the base of the neck," Dodson writes,"a sauropod's vertebral spines, unlike those of a giraffe, were weak and low and did not provide leverage for the muscles required to elevate the head in a high position. Furthermore, the blood pressure required to pump blood up to the brain, thirty or more feet in the air, would have placed extraordinary demands on the heart and would seemingly have placed the animal at severe risk of a stroke, an aneurysm, or some other circulatory disaster."[8]

Within recorded history, Central Asians have tried to breed hunting eagles for size and strength, and have not gotten beyond 25 pounds or thereabouts. Even at that weight they are able to take off only with the greatest difficulty. Something was vastly different in the pre-flood world.

The only way to keep the required blood pressure "reasonable," Dodson goes on to add, is "if sauropods fed with the neck extended just a little above heart level, say from ground level up to fifteen feet..." One problem with this solution is that the good leaves were, in all likelihood, above the 20-foot mark; an ultrasaur that could not raise its head above 20 feet would probably starve. Dodson, it should also be noted, entirely neglects the dilemma of the brachiosaur. And there is another problem, which is worse. Try holding your arm out horizontally for even a few minutes, and then imagine your arm being 40 feet long.

Given a scale model and a weight figure for the entire dinosaur, it is possible to use volume-based techniques to estimate weight for a sauropod's neck. An ultrasaur is generally thought to be a near cousin -- if not simply a very large specimen -- of the brachiosaur. The technique, then, is to measure the volume of water which the sauropod's neck (severed at the shoulders and filled with bondo or autobody putty) displaces, versus the volume which the entire brachiosaur displaces, and simply extrapolate to the 360,000-pound figure for the ultrasaur. I did this using a Larami Corporation model of a brachiosaur, which is to scale. To make a long story short, the neck weighs 28,656 pounds, and the center of gravity of that neck is 15 feet from the shoulders, the neck itself being 38 feet long. This equates to 429,850 foot-pounds of torque.

If we assume the sauropod could lift its head at least as easily as a human with an 18-inch neck can move his head against a neck-exercise machine set to 130 pounds, then the sauropod would require the muscular strength of a neck 17.4 feet in diameter. With a more reasonable assumption of effort, equivalent to the human using a 50-pound setting, the sauropod would require a neck of over 20 feet in

diameter. But the sauropod's neck, at its widest, apparently measured about ten feet by seven feet where it joined the shoulders, then narrowed rapidly to about six or seven feet in diameter over the remainder of its length. McGowan and others claim that the head and neck were supported by a dorsal ligament and not muscles, but we know of no living creature using ligaments to support a body structure which its available musculature cannot sustain. In all likelihood, sauropods, in our gravity at least, could neither hold their heads up nor out.

Antediluvian Flying Creatures

The large flying creatures of the past would also have had difficulties in our present-day gravity. In the antediluvian world, 350-pound flying creatures soared in skies which no longer permit flying creatures above 30 pounds or so. Modern birds of prey, like the Argentinian teratorn, weighing 170 to 200 pounds, with 30-foot wingspans, also flew. Within recorded history, Central Asians have been trying to breed hunting eagles for size and strength, and have not gotten them beyond 25 pounds or thereabouts. Even at that weight they are able to take off only with the greatest difficulty. Something was vastly different in the pre-flood world.

Nothing much larger than 30 pounds or so flies anymore, and those creatures, albatrosses and a few of the largest condors and eagles, are marginal. Albatrosses, notably, are called "goonie birds" by sailors because of the extreme difficulty they experience taking off and landing, their landings being badly controlled crashes, and this despite long wings made for maximum lift.

In remote times, the felt effect of the force of gravity on Earth must have been much less for such giant creatures to be able to fly. No flying creature has since re-evolved into anything of such size, and the one or two birds that have retained this size have forfeited flight, their wings becoming vestigial.

Adrian Desmond, in his book *The Hot-Blooded Dinosaurs*, has a good deal to say about some of the problems the Pteranodon faced at just 40-to-50 pounds. Scientists once thought this pterosaur was the largest creature that ever flew. The bird's great size and

negligible weight must have made for a rather fragile creature."It is easy to imagine that the paper-thin tubular bones supporting the gigantic wings would have made landing dangerous," writes Desmond. "How could the creature have alighted without shattering all of its bones? How could it have taken off in the first place? It was obviously unable to flap 12-foot wings strung between straw-thin tubes. Many larger birds have to achieve a certain speed by running and flapping before they can take off and others have to produce a wing beat speed approaching hovering in order to rise. To achieve hovering with a 23-foot wingspread, *Pteranodon* would have required 220 pounds of flight muscles as efficient as those in humming birds. But it had reduced its musculature to about 8 pounds, so it is inconceivable that *Pteranodon* could have taken off actively."[9]

Since the *Pteranodon* could not flap its wings, the only flying it could ever do, Desmond concludes, was as a glider. It was, he says, "the most advanced glider the animal kingdom has produced."[10] Desmond notes a fairly reasonably modus operandi for the *Pteranodon*. Not only did the bird have a throat pouch like a pelican but its remains were found with fish fossils, which seems to suggest a pelican-like existence, soaring over the waves and snapping up fish without landing. If so, then the *Pteranodon* should have been practically immune from the great extinctions of past ages. Large animals would have the greatest difficulty getting to high ground and other safe havens at times of floods and other global catastrophes. But high places safe from flooding were always there, oceans were always there, and fish were always there. The *Pteranodon's* way of life should have been impervious to all mishap.

There is one other problem. The *Pteranodon* was not the largest bird. The giant *Terotorn* finds of Argentina were not known when Desmond's book was written. News of this bird's existence first appeared in the 1980s. The *Terotorn* was a 160-to-200 pound eagle with a 27-foot wingspan, a modern bird whose existence involved, among other things, flapping wings and aerial maneuvers. But how so? How could it even have flown?

How large can an animal be and still fly?"With each increase in size, and therefore also weight," writes Desmond,"a flying animal

needs a concomitant increase in power (to beat the wings in a flapper and to hold and maneuver them in a glider), but power is supplied by muscles which themselves add still more weight to the structure. The larger a flyer becomes the disproportionately weightier it grows by the addition of its own power supply. There comes a point when the weight is just too great to permit the machine to remain airborne. Calculations bearing on size and power suggested that the maximum weight that a flying vertebrate can attain is about 50 pounds..."

It is for this reason that scientists believed *Pteranodon* and its slightly larger but lesser known Jordanian ally *Titanopteryx* were the largest flying animals of all time. The experience from our present world coincides well with this and, in fact, don't go quite that high. The biggest flying creatures which we actually see are albatrosses, geese, and the like, at 30 to 35 pounds.

The *Pteranodon's* reign as the largest flying creature of all time actually fell in the early 1970s when Douglas Lawson of the University of California found partial skeletons of three ultra-large pterosaurs in Big Bend National Park in Texas. This discovery forced scientists to rethink their ideas on the maximum size permissible in flying vertebrates. The immense size of the Big Bend pterosaurs may be gauged by noting that the humerus or upper arm bones of these creatures is fully twice the length of *Pteranodon's*. Lawson estimated the wingspan for this living glider at over fifty feet.

The Big Bend pterosaurs were not fishers. Their remains were found in rocks that were formed some 250 miles inland and nowhere near any lake deposits. This led Lawson to suggest that these birds were carrion feeders, gorging themselves on rotting mounds of dismembered dinosaur flesh. But this hypothesis raised numerous questions in author Desmond's mind.

"How they could have taken to the air after gorging themselves is something of a puzzle," he wonders."Wings of such an extraordinary size could not have been flapped when the animal was grounded. Since the pterosaurs were unable to run in order to launch themselves they must have taken off vertically. Pigeons are only able to take-off vertically by reclining their bodies and clapping the wings in front of them; as flappers, the Texas pterosaurs would have needed

very tall stilt-like legs to raise the body enough to allow the 24-foot wings to clear the ground. The main objection, however, still rests in the lack of adequate musculature for such an operation."[12] The only solution seems to be that they lifted passively off the ground by the wind. But this situation, notes Desmond, would leave these ungainly Brobdignagian pterosaurs vulnerable to attack when grounded.

While Desmond mentions a number of ancillary problems here, any of which would throw doubt on the pterosaur's ability to exist as mentioned, he neglects the biggest question of all: the calculations that say 50 pounds are the maximum weight have not been shown to be in error; we have simply discovered larger creatures. Much larger. This is what is called a dilemma.

Those who had estimated a large wingspan for the Big Bend bird were immediately attacked by aeronautical engineers."Such dimensions broke all the rules of flight engineering," wrote Colorado paleontologist Robert T. Bakker, in *The Dinosaur Heresies*,"a creature that large would have broken its arm bones if it tried to fly..."[13] Subsequently, the proponents of a large wingspan were forced to back off somewhat, since the complete wing bones had not been discovered. But Bakker believes these pterosaurs really did have wingspans of over 60 feet and that they simply flew despite our not comprehending how. The problem is ours, he says, and he proposes no solution.

So much for the idea of anything re-evolving into the sizes of the flying creatures of the antedeluvian world. What about the possibility of man breeding something like a *Teratorn*? Could man actively breed even a 50-pound eagle?

Berkuts are the biggest of eagles. And Atlanta, an eagle that Sam Barnes, one of England's top falconers in the 1970s, brought back to Wales from Kirghiz, Russia, is, at 26 pounds in flying trim, as large as they ever get.[14] These eagles have been bred specifically for size and ferocity for many centuries. They are the most prized of all possessions amongst nomads, and are the imperial hunting bird of the Turko-Mongol peoples. The only reason Barnes was allowed to bring her back is that Atlanta had a disease for which no cure was available in Kirghiz and was near to death. A Berkut of Atlanta's size, Barnes

Elephants are simply too heavy to run in our world. The best they can manage is a kind of a fast walk. Mammoths were as big and bigger than the largest elephants, however, and Pleistocene art clearly shows them galloping.

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was told, would normally be worth more than a dozen of the most beautiful women in Kirghiz.

The killing powers of a big eagle are out of proportion to its size. Berkuts are normally flown at wolves, deer, and other large prey. Barnes witnessed Atlanta killing a deer in Kirghiz, and was told that she had killed a black wolf a season earlier. Mongols and other nomads raise sheep and goats, and obviously have no love for wolves. A wolf might be little more than a day at the office for Atlanta with her 11-inch talons, however, a wolf is a big deal for an average-sized Berkut at 15-to-20 pounds. Obviously, there would be an advantage to having the birds be bigger, i.e. to having the average Berkut weigh 25 pounds, and for a large one to weigh 40-to-50 pounds. It has never been done, however, despite all the efforts and funds poured into the enterprise since the days of Genghis Khan. The breeding of Berkuts has continued apace from that day to this, but the Berkuts have still not gotten any bigger than 25 pounds or so.[15]

It is worth recalling here the difficulty which increasingly larger birds experience in getting airborne from flat ground. Atlanta was powerful enough in flight, but she was not easily able to take off from flat ground. This could spell disaster in the wild. A bird of prey will often land with prey, and if take-off from flat ground to avoid trouble is not possible, the bird's life becomes imperiled. A bird bigger than Atlanta with her 10-foot wingspan, like a *Teratorn* with a 27-foot wingspan and weighing 170 pounds, would simply not Survive.

Assorted Other Evidence

There are other categories of evidence, derived from a careful analysis of antediluvian predators, to show that gravitational conditions in the distant past were not the same as they are today. It is well

known, for example, that elephant-sized animals cannot sustain falls, and that elephants spend their entire lives avoiding them. For an elephant, the slightest tumble can break bones and/or destroy enough tissue to prove fatal. Predators, however, live by tackling and tumbling with prey. One might think that this consideration would preclude the existence of any predator too large to sustain falls. Weight estimates for the tyrannosaurs, however, include specimens heavier than any elephant. That appears to be a contradiction.

Moreover, elephants are simply too heavy to run in our world. As is well known, they manage a kind of a fast walk. They cannot jump, and anything resembling a gully stops them cold. Mammoths were as big and bigger than the largest elephants, however, and Pleistocene art clearly shows them galloping.

Finally, there is the *Utahraptor*. Recently found in Utah, this creature is a 20-foot, 1,500-pound version of a *Velociraptor*.[16] The creature apparently ran on the balls of its two hind feet, on two toes in fact, the third toe carrying a 12-inch claw for disemboweling prey. This suggests a very active lifestyle. Very few predators appear to be built for attacking prey notably larger than themselves; the *Utahraptor* appears to be such a case.

In our world, of course, 1,500-pound toe dancers do not exist. The only example we have of a 1,500-pound land predator is the Kodiak bear, the lumbering gait and mannerisms of which are familiar to us all. And so, over and over again, this same kind of dilemma-things which cannot happen in our world having been the norm in the antediluvian world.

An Explanation Ventured

The laws of physics do not change, nor does the gravitational constant, as far as we know. But something was obviously massively different in the world in which these creatures existed, and that difference probably involved a change in perceived gravity. This solution derives from the continuing research of neo-catastrophists, that is, followers of the late Immanuel Velikovsky, and is known as the "Saturn Myth" theory.[17]

The basic requirement for an attenuated perception of gravity involves the Earth being in a very close orbit around a smaller and much cooler stellar body (or binary body) than our present Sun. One pole would always be pointed directly at this nearby small star or binary system. The intense gravitational attraction would pull the Earth into an egg shape rather than its present spherical shape, so that the planet's center of gravity would be off center towards the small star. This would generate the torque necessary to counteract the natural gyroscopic force and keep the Earth's pole pointed in the same direction as it revolved around the star.

The consequences of this intense gravitational pull would be dramatic. It would allow, first of all, for gigantic animals like the dinosaurs (just as any change in gravity to the present situation would likely cause their demise). It would also tend to draw all of the Earth's land mass into a single supercontinent (Pangea). Why else, after all, should the Earth's continental masses have amassed in one place? And finally, with the Earth's pole pointed straight at this star or binary system, there would be no seasons. All literature of the distant past points out that the seasons did not appear until after the flood.

The state of the present solar system indicates that this previous system was eventually captured by a larger star, our present Sun. But the pieces of this old system have not vanished. The influential small star or binary system of the past remains, though its reign of power has ended. The star or stars are Jupiter and Saturn, the next largest objects to the Sun in our present system.

It is instructive that the ancients worshiped Jupiter and Saturn as the two chieftain gods in all of the antique religious systems. If the present solar system was present in the distant past, one would expect primitive peoples to have worshiped the most visible of the astral bodies: the Sun, the Moon, and Venus. There is no conceivable reason they would worship as gods two planets which most people cannot even find in the night sky -- unless, of course, these bodies occupied a far more prominent place in the heavens than they do today.

Notes

1. David Lambert and the Diagram Group Staff, *Field Guide to Dinosaurs: The First Complete Guide to Every Dinosaur Now Known*, New York, 1983, p. 118.

2. Christopher McGowan, *Dinosaurs, Spitfires & Sea Dragons*, Cambridge, 1991, p. 118.

3. Knut Schmidt-Nielson, *Scaling, Why is Animal Size So Important?*, Cambridge, 1984, page 163."It appears that the maximum force or stress that can be exerted by any muscle is inherent in the structure of the muscle filaments. The maximum force is roughly a 3 to 4 kgf/cm^2 cross-section of muscle (300-400 kN/m^2). This force is body-size independent and is the same for mouse and elephant muscle. The reason for this uniformity is that the dimensions of the thick and thin muscle filaments, and also the number of cross-bridges between them are the same. In fact the structure of mouse muscle and elephant muscle is so similar that a microscopist would have difficulty identifying them except for a larger number of mitochondria in the smaller animal. This uniformity in maximum force holds not only for higher vertebrates, but for many other organisms, including at least some, but not all invertebrates."

4. The normal inverse operator for this is to simply divide by 2/3 power of body weight, and this is indeed the normal scaling factor for all weight lifting events, i.e. it lets us tell if a 200-pound athlete has actually done a "better" lift than the champion of the 180-pound group. For athletes roughly between 160 and 220 pounds, i.e., whose bodies are fairly similar, these scaled lift numbers line up very nicely. It is then fairly easily seen that a lift for a scaled up version of one particular athlete can be computed via this formula, since the similarity will be perfect, scaling being the only difference.

5. McGowan, *op. cit*,. p. 97.

6. *Ibid*., pp. 101 -120.

7. Harvey B. Lillywhite,"Sauropods and Gravity", *Natural History*, December, 1991, p. 33."...in a *Barosaurus* with its head held high, the heart had to work against a gravitational pressure of about 590 mm of mercury

(Hg). In order for the heart to eject blood into the arteries of the neck, its pressure must exceed that of the blood pushing against the opposite side of the outflow valve. Moreover, some additional pressure would have been needed to overcome the resistance of smaller vessels within the head for blood flow to meet the requirements of brain and facial tissues."

8. Peter Dodson,"Lifestyles of the Huge and Famous," *Natural History*, December, 1991, p.32.

9. Adrian J. Desmond, *The Hot-Blooded Dinosaurs: A Revolution in Paleontology*, New York, 1976, p. 178.

10. *Ibid*, p. 178.

11. *Ibid*, p. 182.

12. *Ibid*, pp. 182-183.

13. Robert T. Bakker, *The Dinosaur Heresies*, New York, 1986, pp. 290-291.

14. David Bruce, *Bird of Jove*, New York, 1971.

15. *Ibid*.

16. Tim Folger,"The Killing Machine," *Discover*, January, 1993, p.48

17. David Talbott, *The Saturn Myth*, New York, 1980.

ON "ALIEN WRITING"

An Interview with Mario Pazzaglini

For the most part Mario Pazzaglini walks confidently through life. As a clinical psychologist with a private practice in Newark, Delaware for the past 22 years he is certainly on firm footing. During this time he has also been a clinical instructor at the Jefferson Medical School. And at times he has been on the adjunct faculty of the department of psychology at the University of Delaware.

But sometimes, by his own admission, Pazzaglini tip-toes through territory most would consider "unacceptable." One such area is "alien writing." His interest in the subject dates back more than a decade. During this time he has collected samples of writing which people claim to have obtained from alien sources by various means. In 1991 he took a first stab at organizing this often vague, very complex, and always controversial material in a book called *Symbolic Messages*. This privately published volume is both an introduction to the study of writing and other symbolic systems, and a look at how "alien writing" fits into the subject. He also presents these found alien symbols as a model for attempting to understand alien intelligence itself.

Pazzaglini has also treaded cautiously through the subject of street drugs. Since about 1967 he has done ethnographic studies on neighborhoods and the kinds of drugs they use and has travelled all over the world in the process. He is now putting together a book on the subject. Its glossary contains entries for about a thousand different street drugs. His interest in the subject stems from a fascination with images--the same subject that eventually led him to study "alien writing." In 1969 Pazzaglini ran one of the drug clinics at Woodstock.

–Patrick Huyghe

How did you come to be interested in "alien writing"?

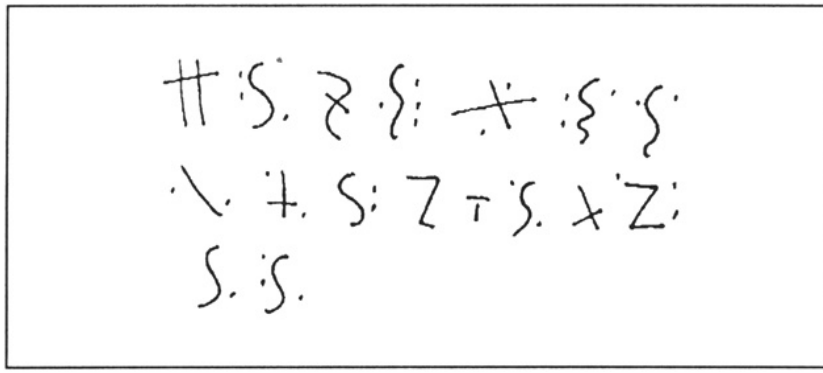
Pazzaglini: I can trace it to my basic interest in internal representation. Out of that grew my interest in images. Out of that grew my interest in symbols. And out of that grew my interest in diffierent forms of writing, in other words, how ideas were put down in symbols. Alien writing is a subgroup of that last interest. I've been doing work on images since about 1965, but this particular collection started about 10 years ago.

The subject sort of appeared as a question in my head. I was reading some books on UFOs and wondered about the whole issue of physical traces. Work had been done on marks on the ground, UFO nests, and such. A couple of articles and books mentioned that there was writing and symbols and I was curious as to what they would look like. So I wrote to these people and began asking them for samples and that sort of took off.

Where did most of your samples come from exactly?

Pazzaglini: There were three main sources. One source was directly from the people, the people who feel that they are contactees or those who feel that they are abductees. I've also gotten some from various UFO authors; Budd Hopkins looked at what I have and he agrees that some samples look similar to what he has collected. My third source was a large stroke of luck; I got them from the estates of George Williamson and George Adamski. These are interesting for me, because these people were part of the contactee movement in the early 50s late 40s, before the field was, in a sense, contaminated.

I also knew from my other work that there were systems in history like this, such as the one produced by Dr. John Dee, the court astrologer to Elizabeth the First, and Edward Kelley. The story goes that a spirit appeared to them, a being of light, who dictated to them an entire system. I have a copy of this manuscript. It's a language, an alphabet, and an entire magical system. This system was then used at the end of the 19th century by McGregor Mathers in formulating the Golden Dawn and the other organizations that grew out of that body of knowledge. That system is known as Enochian and is still in use by various magical and ritual



Sample from a 1987 abductee. Too small a sample to work with, but belongs to the dot and line category of scripts. Usually these are alphabetical scripts.(All examples from Mario Pazzaglini's Symbolic Messages.)

groups. And there are other systems like that. The writing on the golden plates of the Mormon Church is another example. There is a whole history of such material.

How far back does this history go?

Pazzaglini: There are traditions in Egypt concerning the god Thoth, who supposedly devised writing and gave the symbols to the people. Other examples includes Oannes, a half-man, half-fish who did the same job for Sumeria as Thoth did for Egypt. Then there's Dogon who did it for the Philistines and Quetzalcoatl who did it for the people of Central America. In fact, I went to Mexico because I heard rumors of a cave at Juxlahuaca in the state of Guerreo where there are frescoes dating from a thousand to five hundred BC in age. And reportedly there was a picture of a feathered serpent giving a symbol to an Indian. So I went there, and after an incredibly hideous day, made it into this cave and there it was. I'm not making many conclusions out of this, but there is a very strong mythological structure throughout the world of people coming from someplace else and handing symbols to people. The history is in our mythology, too, because Moses got the Ten Commandment written on tablets by the hand of God.

What was the script of the Ten Commandments?

Pazzaglini: No one knows what these symbols looked like but they were clearly thought to be extraterrestrial in origin. The earliest version we have is in ancient Hebrew, which, in historical terms, is a rather recent development. So it certainly wasn't in that script.

I see in your book that some samples are copies of symbols that people remembered seeing on a craft. Others came from a piece of paper or a book they were handed by the aliens.

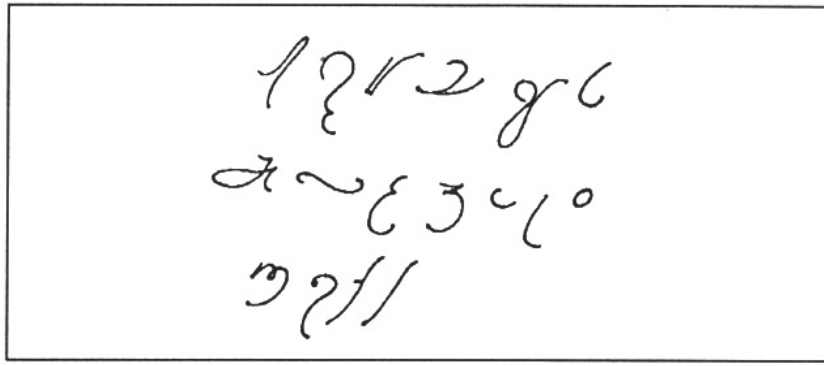
Pazzaglini: Anything you can think of I have an example of. In other words, there are people who copied symbols directly off of objects and this is what they are giving me. There are people who are given books, like Betty Andreasson. They have the book for awhile, and sometimes they can copy down what they saw, or they sort of get the gift of being able to receive more script by telepathic means.

Channeling?

Pazzaglini: Yes, though I've scrupulously avoided that term all through the book at the expense of an awkwardness in language. It's such an overused word. But yes, at one extreme are people who just channel writing.

How many examples of alien script have you collected in the past decade?

Pazzaglini: I probably have nearly a hundred. What's interesting is that if you talk to people about the verbal content of their channeled writing and ask them to send you a sample and use it for publishing purposes, they are usually pretty happy to go ahead and do that. But the symbols people hold very close to themselves, for whatever reason. They seem to be more personal. So I've had a hard time obtaining permission to use symbols of the people who received them. Then there are the researchers who collect this kind of material but who refuse to show them to others so as not to contaminate the field. I can understand that because the field is so incredibly confounded already.



Example of a cursive script from a 1992 Contactee. "I received this in my mind after my first contact"(CE II)."It's both technical and religious...how to manipulate minerals and light."

Does any sample stand out as particularly bizarre?

Pazzaglini: There's one I received recently. The writing appeared on lumber and I saw the boards. I'd really have a hard time believing this if it hadn't come from such a credible person, a person working at a lumber supply yard, who gets injured because these boards fall on his head. And on these boards are all sorts of symbols. Is there a wood burning set in the sky? I don't know. He's baffled and scared and doesn't want to talk about it much anymore.

And you don't find these people psychopathological?

Pazzaglini: No. And if I can brag a little bit, I know. Because I've dealt with all sorts of pathology and he was dead normal. That's one of the questions in my head all the time. It's not that I would exclude someone who is psychotic. But I certainly want to know that. Or if they are multiple personality, which would be even more to the point, I'd want to know that. He showed no signs of psychopathology, nor did his family make any complaints that would indicate any kind of pathology. Then there's the fact that he wants to push it away, which is fairly normal, and not talk about. It just doesn't fit into his life. In general almost none of the people submitting samples has any significant psychopathology.

How about hoaxing?

Pazzaglini: There is a lot of that. And it's of two kinds. There is unconscious hoaxing and conscious hoaxing. I have a few which I've been able to trace down myself because I'm lucky that my first interest is in writing itself. I have a large library on writing and symbol systems. So if I receive a sample I can go look for it, and I know the library well enough to usually find it, if the writing has been copied. In a few instances I have found exact copies of rather obscure languages. They're not always incredibly obscure. One turned out to be from the Book of Mormon. But few Mormons would even recognize it, as only two to five percent of them have actually seen the script. It's like the number of people who have actually read the Bible. Another sample turned out to be from the Phaistos Disk.[Found in Crete in 1908, this artifact has been dated as no later than 1700 BC. The 242 signs impressed on both sides of the disc remain undeciphered, as they bear no resemblance to the ancient pictorial script of Crete or to any other heiroglyphic form of writing.] That's fairly obvious conscious hoaxing.

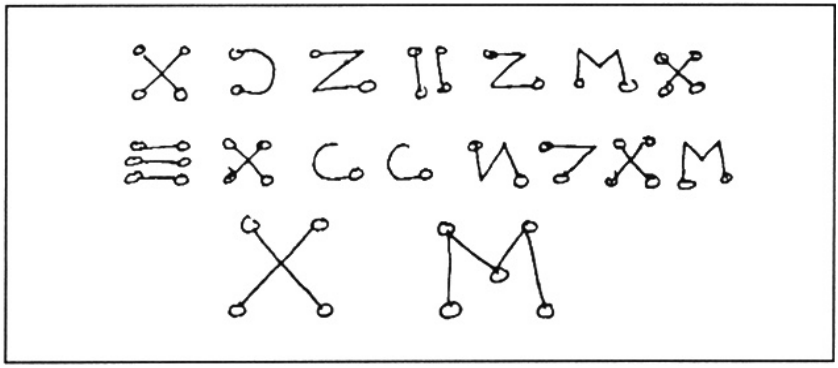
What are some of the features of genuine "alien writing"?

Pazzaglini: I started at the other end of that question and did a study to see what the features would be of blatantly made-up writing.

Yes, you ran an experiment on that. Tell us about it.

Pazzaglini: I've done this a few times actually. I take a group of people and give them simple instructions. Because in my scientific framework there is one set of rules, but if I broaden it slightly I'd have to control for ESP and such, which in terms of an experimental paradigm gets fairly crazy quite soon. So I've kept it simple. What I've done in these pilot studies is take a bunch of people, put them in a relaxed state, and asked them to imagine what an alien alphabet might look like. I ask them to get a picture of that in their heads and, when it forms, to write it down.

You asked for an alphabet rather than a script?



"Angelic-music" writing from circa 1944-45, done at that time by a child 4-5 years old."They gave it to me; it just came into my head."

Pazzaglini: I said alphabet because I wanted to control for whether they produced an alphabet, or a syllabic system, or a pictographic system. But a handful of people didn't follow the directions and produced systems that actually were not alphabets. And believe it or not, some of them then refused to give me permission to write them down, because they said that they had actually gotten them from alien beings!

Really? How many examples like that did you get?

Pazzaglini: About 5 out of maybe 50 people, which is a pretty high percentage, however this group may not have represented the average population. And later on other people came to use the process, incorporating it into their own method of adjustment to life and coping. They would turn to whatever source that was and ask it questions; should I do this or should I do that? A handful of these people have almost totally integrated that process into how they function. That's pretty weird, but it's not unknown.

So anyway, the characteristics of the blatantly made up alphabets–whatever that means now because the definition has become a little shaky here–are that people seem to be limited in how they think about making up symbols. They tend to either regress into scribbles, or into shapes you would expect like triangles, circles, and other sort of archetypal perceptual forms. They also tend to run out

of flexibility and begin repeating basic forms. That's clearly a characteristic of a made up alphabet. Then, when I broadened it and told them not to make up an alphabet but to make up an alien symbol system for representing thoughts, most people produced alphabets anyway, many of which resembled the English alphabet.

So now what are the characteristics of those you consider possibly genuine?

Pazzaglini: First you need a large sample to even begin to make that kind of judgment. One sample I have is about 500 pages and it meets the first characteristic, which is that it should have a limited number of symbols. This one has about 60 symbols, which means it's most likely a syllabic system. The second characteristic is that the symbols must be repeated throughout the text. And in this sample things repeat in different contexts. So this begins to look like a language with the characteristics of having a sound representational system, some sort of definition into words or thoughts, whatever they may be, and a grammar, meaning that there are repeating patterns.

Who produced these 500 pages?

Pazzaglini: It comes from a well-known abductee whose name I would prefer not to mention. Her material looks very much like those from two other abductees who also have had really complex experiences. The writing looks like Greg shorthand. But unlike shorthand its structure appears syllabic, like the structure of Sanskrit or Tibetan. In syllabic systems about 60 different symbols are involved and each one represents at least one consonant and one vowel. English, to put this in perspective, is an alphabetic system, which involves less than half as many symbols and where each one equals a single letter.

Now I have other items that look really alien, but I may only have 10 to 12 symbols so they're hard to judge. I just got one from Poland, for instance, that's very much like this abductee's but you have to sharpen up all the curves, you have to sort of geometrize this abductee's alphabet. It's another fairly complex system with about 68 separate symbols. So it falls within the same framework.

How many types of alien writing have you found?

Pazzaglini: In the book I show three types, a geometric type, a dot-and-line type, and a script-like or cursive form. Now I have another one, which comes from a crashed-saucer witness, and he produced symbols for me that he remembered seeing on the pieces as a child. What's interesting there is that what he retrieves consciously is better than what he retrieves hypnotically. I don't have any other samples that look like his, so in that sense, it's truly alien. It looks like nothing else.

After eliminating the hoaxes and those without enough material, how many promising samples are you left with?

Pazzaglini: About a handful. Out of those three share some symbols, but then it's like comparing your handwriting and my handwriting and someone's printing. If you were totally unfamiliar with the language and if the language was more complex than ours, it would be pretty hard to tell if its the same thing.

What are those symbols on the cover of Symbolic Messages?

Pazzaglini: Those two symbols come from a 3-to-5 year-old boy. They are his "lead symbols." In other words, he looks at those symbols to get back into the mode of pulling more of the writing out of him. What's interesting is that he produced page after page of this stuff between 1943 and 1945. And luckily his parents saved some of it. Turns out it looks like a known alphabet from late Middle Ages, about 14th to 15th century. It looks exactly like what's called the Celestial Alphabet, a ritual alphabet very similar to Enochian in function. Whether that's a coincidence, God only Knows.

How could theories of unconscious processing explain alien writing? How could it be "psychological noise," in other words?

Pazzaglini: I studied with Roberto Assagioli in Italy and he was a friend of Jung's. As part of his theoretical framework, he believed that people had subpersonalities that could act fairly autonomously at times. These personalities or complexes had access to neurological and psychological processes that we don't have direct access to, except perhaps in some sort of creative state. So in his therapeutic process, a system called psychosynthesis, you actively invoke various pieces of a personality (subpersonalities) and reintegrate them into a person's functioning.

It's possible to do this. I've done it and I've taught people to do it. It's essentially the same as teaching people to channel. First you get people into an image and you treat pieces of that image as a representation of a certain subpersonality. Then you name it and form a relationship with it by talking to it, saying "thank you for being here" and such, and eventually you can get it to do tricks. And one of the tricks they will do is to produce alphabets. They'll do anything that you want them to do. Now whether those things become operational, or mean anything in the real world, is another whole story.

Did your clinical practice have any influence on your alien writing work?

Pazzaglini: Yes. One of the sources for the interest is that I've always worked with really ill people, with extremely psychotic patients. And in my career there have been about a handful of patients where I felt like something was going on that we just don't understand at all. Three quick examples. I had a 16-year-old boy from downstate Delaware who was Amish. He came in writing in a totally alien script. This is 1968 and I didn't even know the concept then. But because I was curious I searched and searched and finally found the script and it happened to be one of the magical medieval scripts. Now again, how that gets explained, I have no idea; he had no previous contact with this material.

I had another kid, also 16, an LSD user, and the language in which he spoke was Old High German. Now how he figured his way to Old High German, God only knows, but he did. He didn't speak it well, but he did give me real words. My third example came from a woman who was found on the street preaching, but no one could understand her because she was speaking a language that was really an amalgam of Latin, Greek, and, I think, Slovanic. After I got her to write it down and looked at it, I began to make some sense out of it. Now the content of it was a bit like a science fiction blurb, but it was interesting. She had only gone through the eight grade; she knew none of the languages she used but of course pieces of Latin and Greek are buried in our own language.

These appear to be more suggestive of reincarnation rather than alien writing.

Pazzaglini: I've thought about that, but if I added reincarnation to the mix also, I'd be utterly lost. So I've tried to keep my official thinking on the subject as simple as possible. But I should add this footnote: I studied with Tibetan lamas for about 20 years because I wanted to understand how other cultures have thought about how the human head works inside. They have a tradition called *Termas*. These are what they call Found Teachings. And these can be found in people's heads, in other words, people will have a dream and write down a teaching in maybe a foreign language, or maybe a ritual form of Tibetan, or maybe a totally alien script. What I'm saying is that they consider the phenomenon to be separate from the issue of reincarnation, except that some of the "beings" that have gone on and who stay near the Earth as protectors will sometimes act as transmitting entities. That was interesting to me, because I wondered about that question, too. Here was a culture that believes in reincarnation, but did not use that explanation for those kinds of teachings.

Do you know of others who have collected this kind of material?

Pazzaglini: Obviously Adamski and Williamson did. They collected these writings from all over the place. The oldest example Williamson had was from 1937, from pre-flying saucer days, in other words. But the story involved a craft that landed in a field. When the farmer went out, they handed him a piece of paper and there were symbols on it. And I have that drawing by the original person. It's really a nice piece. There are a couple of the older UFO organizations that have files with this kind of material. But it's rare, actually. And for some reason people haven't been very interested in it. I would think it's a nice piece of evidence and, if nothing else, a fairly startling phenomenon.

You make the argument that the study of alien symbols and scripts might be a useful way of studying alien intelligence.

Pazzaglini: Yes, because the assumptions are--and they are both staggering--either that alien intelligence grows out of similar biology or that it's totally different and then we probably can't even think about it because we are fairly circuit bound. I can make up a lot of good stories about what that intelligence might be like. But there's one type of writing that's very interesting and there are actually systems like this on Earth. That's where the act of writing the symbols themselves actually constellates the neurocircuitry in such a way that the brain becomes receptive to the patterns being drawn and the meanings that they contain at that particular moment. That's a real interesting concept and very different than the system of writing we are accustomed to seeing.

Is it like an automatic translation then?

Pazzaglini: Yes, it's like a recording. That's very much like a sigil. Certain sigils were meant to act that way. In other words, if you take your finger and trace over the sigil it produces a concomitant psychological and physiological change within the person. In fact, in biology there are systems like that; they are called entrainment systems.

What's entrainment? When you and I stand in front of each other, before we even talk, in the first few seconds as we look at each other, we trade information; we interlock by means of our perceptual systems. It's possible to make diagrams that do the same thing, that "arrange" us perceptually. I've actually played with this, I've made such diagrams. Certain kinds of diagrams actually produce minute physiological and psychological changes inside of people. Sometimes these are called sigils. In Eastern iconography they are called *yantras*, or mandalas. That's what a yantra is. A yantra organizes physiology so that psychological processes of a certain nature can be evoked more easily. The process of entrainment answers the question of why ducks don't have sex with cows. And why ducks don't bump into each other. There are innate wiring systems for perceptual recognition and information transfer.

It seems like a fairly important question. People have dealt with the behavioral and social aspects of it, but I'm really interested in the mechanics of how it happens. The brain spends a lot of money, so to speak, developing those systems. And so in evolution the development of these entrainment systems has been very important. For the auditory system, these were lateral line organs in fish, and those became the inner ear and the auditory canal in primates, so the lateral line-auditory-vestibular system has always been used as an orienting sense. And of course, mantras, which are the auditory equivalent of the yantra, operate on this system. They organize physiology so certain psychological processes can take place more easily.

So I've done a lot of thinking about that. Some of the weirder thinking I can't even put into words yet because it's hard to conceive of how an alien organism would occupy this kind of space and maneuver in it and not be of the same system as we. And how would it communicate to us? One of the things the UFO literature makes obvious is that aliens apparently can speak the language of whatever country that they appear in, English in America, Portugeuse in Brazil, Spanish in Mexico. So are they multi-lingual or do we receive in our own language or is it all just in our heads--is outer space really

inner space? That's a piece of epistemology that you could set three philosophers on for an awful long time.

How about possible translations of the alien writing?

Pazzaglini: The abductee who produced the 500 pages of material was still in contact and the aliens seemed to be of a frame of mind that they would answer questions. So I began to ask them questions about how I might go about translating it. That project is still in progress. I did one thing as an exercise. After making certain assumptions–for instance, assuming that it's a syllabic script, that the major symbols are consonants and the minor symbols are vowels–I came out with a tentative kind of transliterations and/or translations. But I'm so far down the assumption line that I'm probably standing on gas. But eventually I got one sentence to actually read out somewhat logically if, in fact, it is a sentence. It said something like "In order to make light solid, show it to the moon." I arrived at that on my own. But when I asked the abductee what this passage was about she said it was about how to make light solid.

So she has an idea what these things refer to.

Pazzaglini: Oh, yes. There is another phenomenon here and that is very often people who have this material will have a gut feeling of what it's about although they can't translate it word for word. You can experience this yourself if you go into a church where people speak in tongues. After you are sitting there for awhile, although you don't understand a word they are saying, you become sort of entrained to them and some of the meaning begins to bleed through. I've done this. It's a great experience.

Have you ever talked about your collection of "alien writing" samples to the highly controversial former Harvard University marine biologist Barry Fell who claims that Old World writing can be found throughout the Americas prior to 1492?

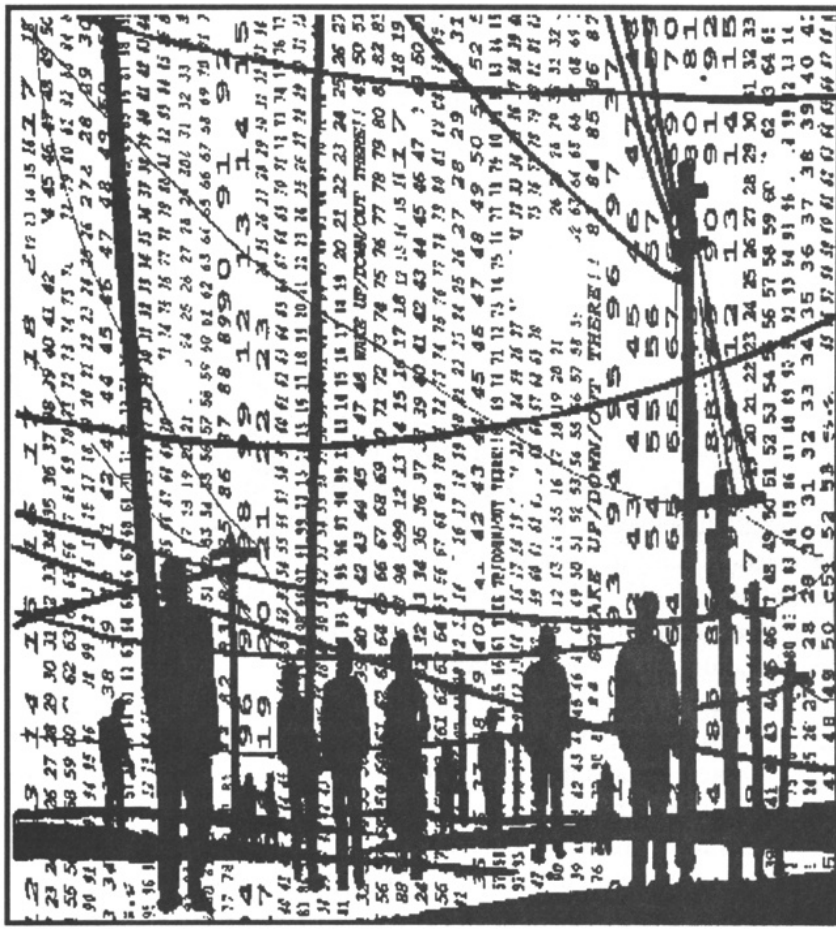
Pazzaglini: Yes, I did show it to one of his "followers" and he has no idea what it is. It looks like nothing he's ever since and he's seen a lot. I got a few of these samples in the mid-1970s and though I hadn't done anything with them at the time, I was every interested in what he was doing because I was interested in languages. But what happens is if you take a pencil and paper and scribble for 10,000 years you are bound to repeat a few things. So you can look at pieces of alien writing and say this looks like this and that looks like that. He had seen one symbol before. It looks like a crescent with a line through the middle. That appears in alien script after alien script after alien script. It's a very stable element. Its also common in the Middle Ages as a sign for different kinds of alchemical processes. It looks like a backward "e." But as a complete form, the alien writing did not seem familiar to him.

Any final thoughts on the subject? Any way to ever hit paydirt in this work?

Pazzaglini: I try not to keep that framework in my head. That will spoil it I think. I don't think I know enough to say more. I can recognize some of the patterns now. I can recognize if a script looks like another script. I can do a few simple tricks. I'm going to continue collecting and I would like to get a computer program so I can put all the symbols into a pattern recognition system. But otherwise I try to keep away from what one person calls "the lust of results." For me, premature belief only destroys perception of the possible. Belief excludes and it's too early to do this. I am not sure even if this is an entirely external or internal phenomenon–or perhaps a mix. It could be that we humans, as a group of beings, can elicit from reality what only begins as our needs, thoughts, and wishes. Could there be a psychoid element, as Jung puts it, that is able to materialize what is internal? Or are we really being spoken to through the noise and chatter of this material? Is this something a process, purely within ourselves, or a complex message system from the outside, from an unknown external source? I'm not sure.

The Numbers Game

by Martin Cannon



Illustrated by Sal Amendola

Occasionally, I write about UFOs.

Occasionally, I speak to folks who claim to have seen them or met their pilots. And occasionally, I get the chance to relate what I've heard before a radio or lecture-hall audience.

Which means, of course, that occasionally someone will ask me:"Has anything weird ever happened to you?"

I always reply "No." But that's not quite true. I can bear witness to one minor but maddening enigma–one which veteran outer-limits researcher John Keel (and a very few other authors) connect to the UFO controversy.

In The Mothman Prophecies, Keel writes of a United Nations public relations officer named Don Estrella, who survived a head-on automotive encounter with an invisible, impenetrable something-or-other that accordioned the front end of his car. Shortly after this bizarre accident, a friend of Estrella's in Long Island received an odd phone call. The U.N. officer reported that "A voice that sounded very distant said 'Hello, Don.' My friend told him that I hadn't arrived yet. The voice then began to recite a series of numbers meaninglessly."

Keel knew of many similar incidents. In 1961, a telephone conversation between two women in Oregon was rudely interrupted by the voice of a mysterious man who shouted "Wake up down there!" According to Keel,"The voice started to rattle on in a rapid-fire language that sounded like Spanish." After this odd locution ceased, the women could speak together normally once more. At the same time next day, the women spoke on the phone again, only to earwitness a repeat performance by the oddball voice. After the audio interloper speed-shouted something in a foreign tongue, it began reciting the numbers forty and twenty-five continually.

Stranger still: Keel claims to have investigated many instances of numbers mysteriously read out over television sets during UFO flaps. These interruptions could not be explained away as shortwave or CB interference. Keel even collected a number of stories from individuals who claimed to hear these numbers in their heads.

In 1967, during West Virginia's great "Mothman" wave of UFO-oriented oddities, Keel encountered the phenomenon again. Every night, a young lady in the area was called by a strange man who

would speak to her in an accelerated speech that sounded "something like Spanish...yet I don't think it is Spanish."

Brad Steiger's *Mysteries of Time and Space* refers to an exactly similar incident. A female informant was speaking to a friend on the telephone, when their conversation was interrupted by an unusual male voice repeating meaningless two-digit numbers. Thinking quickly, one of the women identified herself to the voice as one of the numbers whereupon the intruder plunged into the rapid-fire pseudo-Spanish noted by Keel's sources. Like Keel, Steiger connects such incidents with UFOs and similar other-worldly phenomena.

Now, to paraphrase an old Bill Cosby line, I told you those stories to tell you this one.

Because, you see, it happened to me.

* * *

The story begins sometime in the early Reagan era, when the homeless multiplied like cancer and I came parlously close to joining their ranks. Those were the days when I faced that queasy interregnum between exiting college and finding a niche within one's chosen profession, and since I had chosen the field of art and illustration, the interregnum threatened to last a lifetime. As it happened, this transition period lingered for nearly three astonishingly miserable years, which I spent sequestered in a dank "bachelor pad" roughly the size of a Maytag appliance. I sustained myself with a succession of stultifying employments, punctuated by the occasional art assignment.

Generally, I worked the graveyard shift. It fit my mood.

One thing you have to understand about graveyard: The worst aspect of working those hours is not working those hours. What do you do during those nights when the job's not there but caffeine and a chronic insomnia still keep you alert at three, four, five in the morning?

My brother suggested loop lines.

He had learned of these from a computer bulletin board. I spent an evening at his house (he was prosperous, having opted for fast-food management instead of higher education), and received a

guided tour of the board's data base–which, for some reason, contained an introductory course in "phone phreaking." Phreaks, as they like to call themselves, are techno-pranksters who enjoy tweaking the nose of "Bitch Bell," and loop lines are a major weapon in the phreak armory.

The telephone company invented loops to serve some arcane testing purpose which need not concern us here. The important point is that 99.9999% of the time the lines lie dormant--officially. Unofficially, they're a phreak phantasia. Imagine phone lines connected to no telephone, lines that "float" somewhere in the central office of the Telco (if you'll forgive the lapse into phreak-speak). Loops come in matched pairs, and the numbers usually occur in the upper strata of an exchange. Thus, if you dial (212) XXX-9977, you'll speak to whoever might be waiting on (212) XXX-9978.

Why do this? Basically, it's networking for nerds: The loops serve as a sort of lonely-heart's club, whereby individuals in widely-separated cities can compare notes in the safety of telephonic anonymity. Occasionally, opposite-sex phreaks loop into each other, resulting in long-distance romances.

What's the advantage of linking on the loops, as opposed to direct dialing? According to my pseudonymous bulletin board informant, by using loops one could "avoid long distance charges." In other words: free calls. Phreak samsara.

Well, I considered all this info interesting, but not compelling. One had to be a very lonely guy indeed to dial dolts in far-off locales just to hear human vocalizations. And, hey, I wasn't that far gone.

Cut to: Three weeks later.

2:30 A.M. I had finished the night's assignment. My eyes remained wide open, my ancient and rather persnickety television set suddenly became obsessed with snowscapes, my car refused to budge and there was nowhere to drive to anyway because the town was pretty thoroughly shut. The only unread book in the apartment was Samuelson's *Economics*. I considered mugging someone--not for the profit motive, but as a conversation-starter.

Nights like this can drive the best of us to "loopy" behavior.

I got out my list of numbers, and started dialing.

* * *

I had numbers for New York, Chicago, and other points east. Most of these connected me to silence. Occasionally, I got odd, repetitive electronic tones--curious, but (since I had not yet acquired a taste for Philip Glass) unsatisfactory.

The Montreal lines were livelier. Here, I encountered actual people, or the closest approximations thereof Canada had to offer. Alas, most of these phreaks made me wonder why I was ignoring Samuelson.

Then I heard The Voice.

Actually, The Voice was preceded by The Tone, a subtle electric buzz somewhat akin to the sound you hear when you hold a seashell to your ear. This faded away, gradually replaced by a young, male Voice reading numbers.

"27...28...29...27...28...29...27..."

During the next few weeks, I heard The Voice many times; after awhile, it seemed to take over the entire loop universe. Roughly every second or third call would connect me to the same tenor orator, constantly repeating a series of two-digit numbers. As I recall, the numbers never dipped below 20 or above 60. The Voice did not acknowledge anything I said to it. Was it a machine? Perhaps--although

this was no simple tape loop. Every so often, the voice would interrupt its strange soliloquy and shout:

"Wake up out there!"

Then more numbers. (Keel's informants recall the statement as "Wake up down there!" Since I never achieved a clear-as-a-bell connection, I suppose either reading is possible.)

More rarely, I heard gibberish sessions–the odd, sped-up instructions in a strangely familiar foreign language. Imagine Alvin the Chipmunk on amphetamines delivering a lecture in Spanish. At least, it sounded like Spanish. While I've never studied this language, I am a native of Los Angeles, which has the largest Mexican population outside of Mexico City; anyone raised under these circumstances should instantly recognize such a commonly heard tongue. I felt no such recognition here:"Spanish" is not an identification, merely the best available analogy.(Portuguese, perhaps?)

Part of the problem resulted from the rapid-fire delivery–during the "Spanish" lessons, my telephonic narrator never paused for punctuation. Even if you play a dialogue tape at faster-than-normal speed, you'll usually hear some conversational caesura. Why none here?

I had to know what was going on.

Thereafter, whenever the gods of loopdom connected me with a seasoned phone phreak, I would inquire about the "Number-Man." After all, the Telco used loops to test new exchanges; wasn't it possible that these strange monologues constituted some part of the test?

Negative, the experts told me. The Bell brigade came online during only normal working hours, and my loop activity occurred earlier (even accounting for the difference in time zones between Montreal and L.A.). Moreover, Telco employees had pretty much stopped using those particular lines. And when official phone folk did use loop lines, they most assuredly did not spout meaningless numbers or jazzed-up quasi-Spanish.

Had other phreaks also heard these strange messages? A few had. They were just as puzzled as I. Moreover, the telephone company couldn't provide any official explanation–it doesn't even like to

admit that loop lines exist. So if anyone was going to solve the enigma, it had to be me.

Fortunately, my brother had loaned me a creaky, barely-functional telephone answering machine, which, when used not-quite-properly, could also record conversations. The solution was obvious: Preserve on oxide the lightning-fast snatches of psuedo-Spanish--and try to have it translated, examined, and explained.

I became a furious looper. Whereas once I regarded the Number-Man as an annoyance, now I demanded an audience. He wasn't hard to reach, and I actually got a bit of his routine on tape. It was Number-Man's greatest hit:"35...37...35...37..." (Unfortunately, I no longer have the cassette.) But nothing I could do or say goaded him into delivering his gibberish arias en ersatz espagnol--like the stereotypical trained dog, Number-Man wouldn't perform his best trick for others. Brad Steiger's informant seems to have hit upon a method of "cuing" the performance, but, alas, I never managed to do so.

One morning I was awakened by a telephone call. I blearily said "Hello."

And Number-Man answered: "Wake up out there!" Followed by numbers. He may even have slipped me a bit of the Speedy Gonzales material; I can't recall at this date. But, as you can imagine, the situation struck me as tres freaky. Apparently, Number-Man had my number.

One night shortly thereafter, following a few unsuccessful encounters with my numerically-obsessed nemesis, I looped into someone even more interesting–who, I now suspect, may also have played a role in this enigmatic drama. Her name was Joanne, and her voice was so agonizingly sexy I felt tempted to propose to her the moment she whispered my name.

Dig it: Joanne told me she worked as a stripper in Montreal. She enjoyed her work, sashaying her voluptuous assets for all and sundry to goggle. Still, most of the guys she met annoyed her; they assumed she was all body and no mind. Joanne could tell that I was of a higher caliber than her lumpenprole clientele: She just knew that I was

intelligent, articulate, and possessed of a rare sensitivity. How she knew this I knew not, since I had Porky-pigged fewer than ten words to her. Nevertheless, she informed me that she was considering flying out to L.A. to meet me! First, though, I had to write her a long letter, describing myself, detailing my history, interests, aspirations...

She gave me an address. I kept it for years. But I never responded, fearing that her invitation contained the seeds of a nightmarish embarrassment. Suppose I composed a message of de Bergerac-ian eloquence, and cajoled her to make the trek westward: What kind of date could I offer? A chance to make out in the rusting corpse of my '72 Torino? No. In this case, wimpitude was wisdom.

* * *

Nearly a decade later, Joanne's (admittedly delightful) intrusion strikes me as deeply mystifying. Was she really just a lonely ecdysiast? Perhaps–but there was something oddly theatrical about the episode, which seemed designed to fulfill every aspect of a lonely-guy's most outlandish fantasy. Joanne was too good. Was I really so charming a fellow that this pretty young thing felt compelled to meet me after I had burped out no more than a hazy half-sentence or two?

One thing's for sure: She almost received a great deal of information about me. Maybe that was the point.

At any rate, my experiments with loop lines ended soon thereafter. I got the bill.

Seems I had misunderstood my original instructions on matters phreakish: Loop lines do not come free. (Later, I discovered where I went wrong. Using loops to beat the system requires strategy: You arrange with a friend in a distant city to use a loop that's local for him at a certain time, then you ask the operator to place a collect call to the other side of the loop. The operator will ring up the number and talk to your comrade, who will happily accept the charges--after all, he's not going to pay a cent. Fiendishly clever, no?)

Paying Bitch Bell her ton of flesh proved crushing; I considered it a penance for the sin of phreakery, and resolved never to

commit such error again. Nevertheless, a year later I again briefly experimented with the loops. Number-Man, as far as I could tell, had taken his act elsewhere.

* * *

Years passed; I segued from being a starving artist to being a lower-middle-class artist. Eventually, I rationalized Number-Man as "one of those things," although no one I met who was learned in the telecommunicative arts could ever explain to me just what kind of thing I had encountered. Then I read Keel and Steiger.

They knew of Number-Man, and they tied him in with UFOs.

Indeed, UFO abduction lore contains a few examples of cognate incidents. For example, Budd Hopkins's *Intruders* notes that well-known abductee "Kathie Davis" received a series of odd telephone calls in 1980. Repeatedly, a voice spoke to her in an indecipherable language, and when she changed to an unlisted number, the voice continued to ring her up.

An abductee of my acquaintance once received a series of "empty" telephone calls during which she heard nothing but the fuzzy, seashell-like electronic tone that preceded all of my encounters with Number-Man. Like some of Keel's contactees, she also heard numbers in her head. Somehow, she even got the impression that she was to perform certain actions in conjunction with certain numbers. She also heard (both "telepathically" and during abduction episodes) rapid-fire instructions which she felt she would comprehend, and act out, at a later date.

And yet: I don't think the answer lies with UFOs. I think we're dealing with spies.

My encounters with Number-Man call to mind the mysterious "number readers" which afflict the shortwave band. For many years, on various frequencies, female and male announcers have broadcast four- and five-digit numbers in several different languages. In his 1983 book *Big Secrets*, William Poundstone speculated that these transmissions involve codes used by drug-runners, or perhaps by the Cubans. But a few years later, appearing on a local tabloid-TV

program called "Eye on L.A.," Poundstone revealed that shortwave enthusiasts had triangulated the broadcasts to their most probable origin point: The state of Virginia.

Which pretty much gives the game away.

In his book *Without Cloak or Dagger*, ex-spook Miles Copeland reveals that clandestine shortwave messages sometimes take the form of "screech" broadcasts: The information is sped up, making it incomprehensible to outsiders. One can retrieve the data only by recording the message and replaying the tape slowly.

Consider the loop line as an espionage tool. You can check the telephone records of anyone calling the lines and you'll never learn who his contact is. A trace will turn up nothing: Even the telephone company will be forever mystified. Loops are the last bastion of telephone privacy, and would therefore prove enormously helpful to an operative seeking secure communications.

Consider, in this light, my contact with the sweet stripteuse Joarne: Was she a ploy, designed to ferret out background information from someone who had stumbled onto the operation?

Finally, consider an even stranger possibility indeed, a possibility so thoroughly bizarre that I raise the issue with some trepidation: The telephonic induction of hypnosis.

Many researchers in hypnosis will tell you that there ain't no such animal as telephone trance. But I have examined the released CIA documents on ARTICHOKE, BLUEBIRD, MK-ULTRA and similar "mind control" programs, and one document unequivocally asserts that telephonic induction of a deep hypnotic trance was successfully tested in the early 1950s. (If you doubt that the government's efforts to create a "Manchurian Candidate" met with greater success than has ever been officially admitted, consult Walter Bowart's excellent– albeit difficult-to-find *Operation Mind Control*.)

Some years ago, I began annoying/intriguing the UFO community with a research paper, entitled "The Controllers," exploring the possibility that some "UFO abductions" may actually be disguised continuances of the clandestine mind control projects referenced above. Although I doubt that John Keel would endorse this explanation, he does strongly affirm (in *The Mothman Prophecies*, in

Operation Trojan Horse, and elsewhere) that some form of post-hypnotic suggestion seems to affect selected UFO percipients.

Is it possible that the rapid-fire "Spanish" actually constitutes some form of hypnotic suggestion, incomprehensible to the normal listener but subconsciously understandable by a properly "trained" individual? If so, we may discover here some explanation as to why number readers, and similar telephonic annoyances, crop up in UFO flap areas, and why these calls seem to herald odd phenomena and odd behavior. The Tone itself may also act as a hypnotic cue (provided the listener has been previously conditioned).

Now, I freely admit that the above suggestions are highly speculative. But this minor-key mystery must have some sort of solution. Granted, this conundrum can hardly be considered an earth-shaking matter; still, it has haunted me for years, rather like one of those stray pups that won't stop trailing you. I invite other suggestions and comments. (Of course, I also invite Joanne of Montreal to offer her side of the story: If you're a spook, all is forgiven; if not, forgive me. Whatever the circumstances, you gave a lonely lad something mighty interesting to ponder during one sleepless night.) Additional examples and alternative explanations would be most welcome.

If anyone has alternative explanations...

Does anyone?

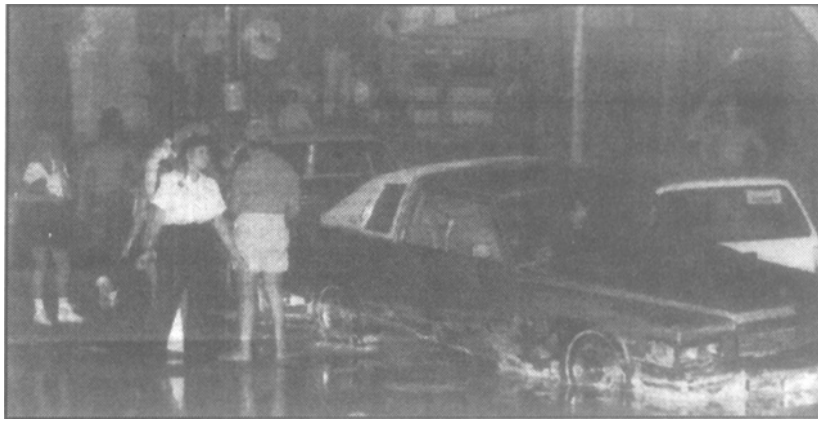
Wake up out there!

THE DAYTONA BEACH MYSTERY WAVE

by Patrick Huyghe

It all began when a giant wall of water rose from a calm sea and came smashing down on Daytona Beach, Florida at 11 pm on Friday, July 3, 1992. The freak wave wrecked havoc on the "World's Most Famous Beach," swamping hundreds of parked cars and injuring 75 people, according to initial reports. By the time the story reached the other side of the "pond," however, tabloids such as the London Daily Mail had embellished certain details of the story. The Brits were told that the wave had "brought terror" as "thousands fled." [1]

I'm told the story appeared on CNN and was picked up by the wire services, but I didn't learn of this incident until several months later. By this time there were reports linking the "rogue wave" to a "falling object" seen by a boater who had been offshore at the time. [2] Frankly, I found this possibility particularly intriguing. Scientists are always talking about the likelihood of a giant asteroid smashing into us one day, causing massive destruction and death, but they generally seem to disregard the accompanying probability of smaller celestial objects impacting the Earth with far greater frequency, and causing more localized, small-scale damage. I wondered if such an object had been the cause of the Daytona event and for the next year I kept an eye out for further reports on this mystery wave in the scientific literature. But nothing appeared anywhere on this remarkable incident, so in December of 1993 I decided to look into it myself.



Minutes after rogue wave hits Daytona Beach, boardwalk patrons survey the damage. Photo by Mike Orlando.

I assumed the best coverage of the event had been in Daytona itself and got hold of the six articles on the "giant wave" that appeared over a one week period in the *Daytona Beach News-Journal*. The first story [3] appeared on July 4th and recounted several personal encounters with the "rogue wave." Sgt. Bill Marshall of the beach patrol was on duty in his Jeep Cherokee near the Boardwalk when he saw something out of the corner of his eye. "I turned and looked and saw a huge wave at least 10 or 15 feet high," he told the reporter. "It washed completely over my vehicle and pushed me into another car. It just washed out a whole line of cars. There was a full-sized Chevy van in front of me that did a complete 360 when the wave hit."

Roy Bennett and his wife had an even bigger scare. They had just left the Broadwalk, where they had been playing video games, for a walk down on the beach. At one point Bennett happened to look out over the ocean. "I saw this huge wall of white water," he said. "It was real quiet. I told my wife to run and I ran behind her. If we hadn't run, we'd have been pinched in between cars, or cars would have been on top of us." Bennet reported seeing other people bleeding and a lot of smashed car windows. Others reported seeing sailboats on top of cars.

John Kirvan, Volusia County's chief beach ranger, saw it too. "It was the strangest thing I've ever seen down here," he said. "I've got men who've been here 30 years and they've never seen anything like it." Though there had been several minor injuries, Kirvan knew of no serious ones. By one o'clock in the morning tow trucks and rangers had pulled most of the vehicles out from the wet sand. Later they would find that some toll booths had been washed off their foundations and that trash cans and barricades had been swept out to sea.

Undersea Earthquake

On Sunday July 5th, the front page of the *News-Journal* displayed a photograph of the aftermath of the incident taken by a patron of the Main Street Bar. [4] The headline unveiled the first official explanation for the incident: "Undersea landslide blamed for giant wave." After the wave hit, National Weather Service officials had contacted the U.S. Geological Survey in Washington, D.C. seeking a possible explanation for the rogue wave and had been told that an undersea landslide might have been responsible.

Frank Baldwin, a senior seismologist for the USGS, later spoke to reporter William D.A. Hill about this theory. The belief that the wave was caused by a landslide acompanied by shifting sands, he explained, is based on what oceanographers know of the ocean floor in the vicinity of Daytona Beach. He did note that while undersea landslides are common in the area, rarely do they cause waves like the one that had hit Daytona. Based on U.S. Coast Guard reports from boaters who said they experienced no unusual activity, the wave was thought to have been generated by undersea activity no more than 10 miles out. The Coast Guard and Air One had conducted a search for people who might have been swept out to sea by the wave but they had found nothing but glassy seas.

What had hit Daytona was not a tidal wave, Baldwin explained. If it had been, it would have affected the entire coast of Florida and a good part of the Eastern seaboard as far north as Norfolk, Virginia. Nor did it have anything to do with a tsunami, he said, the earthquake-triggered wave common to the Pacific Ocean. Baldwin also noted that

there had been no seismic activity at the time. "We don't even have a minor shock that might explain it," he said.

By Sunday just what had happened at the start of the weekend was a bit clearer. The wave, said to have measured about 250 feet wide, had a vertical height of about 18 feet in the area of the Boardwalk and the Main Street Pier, but affected to a much lesser extent a 20-or-so mile stretch of coastline from Ormond Beach in the north to New Smyrna Beach in the south. Everyone was thankful the wave had not hit one day later, on July 4th,. "We are truly lucky this thing happened at 11 pm Friday night and not 11 am this morning," chief beach ranger Kirvan told the reporter. "We'd be counting the dead if it had." In fact, although 75 people were said to have been injured, the chief could not confirm a single hospital admission from the wave.

The *News-Journal* story ended with comments by two weather officials. Fred Gonzalez of the National Hurricane Center in Coral Gables, Florida said that their equipment showed no record of swells in the Atlantic that night. And 48 hours of weather data before the incident showed no storm activity capable of producing such a wave. In fact, the seas had been calm with winds of less than 15 knots as far as 500 miles out. The wave occurred in seas with wave heights of just one to two feet.

"Our buoys off Daytona don't even show the big wave coming," Gonzalez said. "The buoys that should record something like that are 100 miles and 40 miles off Daytona, but they show nothing at all." Never in his 33 years with the weather service had Gonzalez ever heard of anything like it. "Nobody here has any idea what caused the wave," he said.

Mark Albertelli, a National Weather Service meteorologist at the Daytona Beach Regional Airport, was stumped as well. At the time of the big wave he had been on the beach in St. Augustine, about 50 miles to the north of Daytona. "It was calm," said Albertelli. Other weather stations along the coast reported calm seas as well.

By Tuesday oceanographers and geologists were surveying the beach to determine the cause of the wave, according to the next *News-Journal* story. [5] Oceanographer Jeff List of the U.S. Geological Survey's Center for Coastal Geology at St. Petersberg was calling it

Of explanations there was no shortage, from underwater earthquakes and landslides, to a squall surge, oceanic "burp" and meteorite.

"an extremely rare event." In fact, he admitted, "No one I've talked to has ever heard of it happening here before."

Meanwhile, Robert Dean, chairman of the University of Florida's Coastal and Oceanographic Engineering Department, seemed to buy into the underwater landslide hypothesis, explaining that a part of the continental slope that deepens very gradually must have become unstable in one spot. On Monday, scientists in his coastal engineering department had simulated the effects of the giant wave with one of their five wave-making machines complete with model cars being tossed around by a wall of water. Dan Hanes, an associate professor of coastal engineering in the department who has studied waves for 10 years, found the underwater landslide idea plausible but not convincing. "There may be something else out there that we don't know about," he is quoted as saying. The *News-Journal* mentioned a few of the other possibilities: an underwater explosion or military test, a meteorite, or a nuclear submarine.

Oceanic Burp

By Wednesday, the newspaper was still focused on the undersea landslide theory and was presenting an explanation for how a landslide could have caused such a wave. It was due to a "Huge undersea 'burp,'" according to the headline. [6] The expert who had proposed the oceanic "burp" theory was Richard Meyer, a veteran oil industry geologist with Getty and Texaco who was now the natural resources manager for Volusia's Department of Environmental Management.

Meyer thought the wave had been caused by a tremendous upsurge of natural gas beneath the Atlantic. He explained how oil industry executives seeking new fuel sources had documented a phenomenon called hydrates, which are icy mixtures of water and gas found in waters deeper than 1,600 feet. The hydrates form a hard mass that can trap liquids and gas in cavities below it. Meyer's

educated guess was that a hydrate had formed along the continental shelf off Daytona Beach and captured methane gas that forms naturally in oceanic mud. Then last week, he suggests, an undersea landslide had smashed through the hydrate and released the trapped gases, which surged upward at a spectacular pace and produced this enormous wave energy.

The *News-Journal* ran a second story on the "renegade wave" that day, which told of researchers who had examined its traces. [7] Oceanographer List and his colleague Mark Hansen of the USGS at St. Petersburg had spent four hours interviewing witnesses and surveying the beach for high water marks, which they could use to make an educated guess about the height and width of the unusual wave. But Monday's heavy rains had obscured most signs of the giant wave. Relying more on reports from observers, they concluded that the wave was highest in the Main Street area of Daytona, but doubted that it was as high as 18 feet. List thought no definitive cause would be found "unless we get real lucky," he said. The paper also reported that only 20 injuries, all minor, had been confirmed, that no one had been reported missing, and that most of the automobiles damaged that night had been parked on the beach itself, which is typically used as an overflow parking area.

List then apparently got lucky. A few days later the *News-Journal* reported that the oceanographers had changed their minds about the probable cause of the "rogue wave." [8] They no longer thought an undersea landslide was responsible. A landslide severe enough to trigger the wave would probably have caused a tremor and been picked up on the USGS seismic monitoring network, explained List, and nothing was picked up.

List also discounted some other theories that had been bandied about. He saw no evidence for Meyer's gas "burp" explanation, or for the submarine theory that some locals, including a few with Naval experience, had proposed. The submarine theory had surfaced along with President George Bush on the 4th of July. The President had visited Daytona International Speedway that day and some locals recalled reports that U.S. Navy submarines had been stationed offshore when President Ronald Reagan had visited in the 1980s. Could a

submarine surfacing rapidly just offshore have caused such a wave? Not likely. List could not fathom just how a submarine could have triggered the big wave.

Squall Surge

List's new explanation was that a freak storm had caused the rogue wave. A storm? I thought storms had been ruled out as a possible cause for the big wave from day one. Well, not exactly, it seems. List had now uncovered new evidence to support the weather theory. The USGS researchers learned that a storm system had moved rapidly down the Atlantic coast on the night of July 3rd and had stopped around Flagler Beach, shortly before the wave came ashore.

"We looked into the meteorologic data and, amazingly enough, it did show a very long squall or thunderstorm line moved (sic) down down from Georgia," List told *News-Journal* reporter Denise O'Toole. "The timing of this storm coming south was perfect for when the wave hit Daytona Beach."

List noted that a tide gauge near St. Augustine had recorded a "blip" around the same time as the wave. Further corroboration came from reports that the wave had hit the coast from north to south, rather than hitting all at once directly from the east. When List modeled the event he found that it would take a storm system moving at least 30 miles an hour parallel to the coast over water about 20 feet deep to produce the freak wave. List said precisely those conditions existed at Daytona on July 3rd, 1992.

List's position had not changed when I interviewed him in December of 1993. "We still believe it was caused by a squall-line surge phenomenon," he said. "It was a fast moving squall line that moved down the coast and kind of pushed up a big bulge of water ahead of it. The squall line then stopped in its tracks about 10 miles north of Daytona Beach and a large wave kind of propagated away from that squall line and slammed into Daytona Beach." List and his colleagues were preparing a paper on their theory [9], but they had been beaten to the punch by a team of scientists from the University of Florida at Gainesville.

Robert Thieke, an assistant professor in the department of Coastal and Oceanographic Engineering, Robert Dean, chairman of the department, and Andrew Garcia, a research oceanographer with the Coastal Enginneering Research Center at the U.S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi, had presented the same squall-line surge explanation for the Daytona event at WAVES '93, the second international symposium on ocean wave measurement and analysis, which was held in New Orleans in July of 1993. [10]

It seems that a few days after the National Weather Service's original report that there had been no large scale storm activity anywhere near Daytona Beach on the 3rd of July, the first observations of relatively small scale meteorological activity along the Florida shoreline began to trickle in. "These accounts," states Thieke's report, "include the observation of large scale thunderstorm systems with several waterspouts offshore of Jacksonville, a waterspout observed on the beach just north of St. Augustine, a sudden increase in wind speed from near calm to approximately 40 mph measured by a shipboard anemometer in St. Augustine marina, and sudden changes in wind speed and temperature along Crescent Beach."

Their analysis of tide gauge data from Savannah, Georgia to Miami showed nothing except one small anomalous wave of about 1.4 feet at St. Augustine two hours before the impact at Daytona Beach. This focused their "attention on a relatively rapidly moving squall line which formed over inland Georgia and South Carolina and progressed from north to south along the Gerogia and Florida coastline on the evening of 3 July." They derived the approximate position of the squall line from sequential radar images obtained from the National Weather Service in Daytona Beach. Though these radar plots only indicate intensity of precipitation, Thieke felt that they delineated the progress of the squall line fairly accurately. The plots allowed them to estimate the southward propagation speed of the squall line at 30 mph. The 10:25 plot shows the final position of the squall line north of Daytona Beach. The next image, at 11:25, shows that the squall had largely dissipated.

When Thieke, the first author of the paper, first heard the news reports of the wave, he simply did not believe it. As a result he did not go down to Daytona until several days later, a situation he now regrets, as the wave's water marks would have been much more apparent. The unusually high debris line the wave left behind was still quite visible in some spots, however. The researchers found that the maximum wave runup that night had occurred just north of the Main Street Pier and extended about 6.1 feet above the high tide mark. The wave struck at nearly high tide when the the mean high water level or wave run-up is normally 4.3 feet.

Though the wave impacted almost 30 miles of coastline, according to the researchers, significant wave run-up was confined to a narrow region about 5 miles in width and roughly centered on the Daytona Beach pier. But when Thieke and his colleagues used a laboratory model to calculate the wave height based on their knowledge of the wave run-up data, the height of the breaking wave came out to 3.8 feet, substantially less than any observation made by witnesses in Daytona Beach. "Obviously," Thieke explained to me in an interview, "this simple model is not sophisticated enough to capture the complete effect of the wave running up the beach."

Though rogue waves like the one that hit Daytona are rare, according to Thieke, they are apparently not without historical precedent. The large wave that struck the southern Lake Michigan shore on June 25, 1954 and resulted in 7 fatalities, is thought to have been produced by a squall line similar to the one that hit Daytona Beach. A similar wave propagation mechanism has been invoked to explain the large wave which struck southern England in 1929 and also claimed fatalities. Numerous other, though smaller, squall-line surges have also been reported on the Great Lakes.

"Squall-line surges," Thieke explains, "are different than storm surges which are caused by wind stress blowing over a large area of water for long periods of time. In squall-line surges a pressure disturbance causes the wave. So while a storm surge may last for several hours, or even half a day, squall-line surges are over and done with in about a minute." Thieke says he is over 90 percent confident that such

a squall-line surge caused the big wave that momentarily soaked Daytona Beach on the of July 3rd, 1992.

Meteorite

Others are not quite so sure. "I think Thieke's all wet," Neil Opdyke, a University of Florida geologist, told me in December of 1993. "It wasn't a damn storm, I can tell you that right now. It can't be a storm coming down the coast because that would require the wave to make a right angle turn, and waves don't do that. And a wave traveling from north to south is not going to give you a wave front that is highest at one point on the coast. Besides, we asked the Navy and the Navy said there was no chance it could be a storm. But Doug Smith and I are the only ones to come out of the closet and say that it had to be something other than a silly storm."

Doug Smith is Opdyke's colleague in the geology department. When Smith, who is director of the University of Florida's earthquake seismograph network, got word of the wave he immediately queried the network stations and found that there had been no seismic event. He then sat down and discussed the situation with Opdyke, and together they considered the possibilities. It could not have been an undersea landslide; the continental shelf off Florida is too broad and shallow and without the extreme bathymetric features needed to contribute to a landslide. The idea that a seepage of natural gas had caused a pressure wave was also unlikely as the area is devoid of petroleum opportunities. They thought that some kind of military testing was a possibility, but after checking with a former student who was now with the Naval Research Lab in Mississippi, they learned that this was not the case. And like Opdyke, Smith also felt the freak storm theory was "too contrived."

The most likely explanation for the wave, they finally concluded, was a meteor impact. "It looked like an impact," explains Opdyke, "because it peaked at one point on the coast and fell off in each direction up and down the coast."

A few weeks later Smith was giving a talk to a local Rotary or Lions Club – he doesn't remember which – when he said that short

of a meteorite impacting the area, they were frankly a little puzzled about what the cause of the big wave might be. Then one member of the audience, a lawyer, mentioned that he had a client who had been piloting a boat at the time, had seen a large meteorite, and then had to deal with the wave almost swamping his boat. He told Smith that he would have his client call him.

"Sure enough the guy did call," Smith recalled in my interview with him. "He was not the sort of guy who was trying to find his 15 minutes of fame or anything. He didn't want any publicity. He had read about the big wave, but did not associate it with what had happened to him. But with prompting he was able to recall some details of the event; it had never occurred to him to think about the angle in the sky, the direction, trajectory, or anything like that. He had just seen something while piloting a boat up to St. Augustine and was actually offshore Daytona at the right time. He said that as soon as he had seen the meteorite he called his wife to tell her because he had never seen anything like it. It was an offshore radio linked call and the time of the call was recorded on the telephone bill. The time fit perfectly with the timing of the event. And so we plotted his location on a map and then based on his description, we were able to reconstruct an impact point."

I had been trying to learn the identity of this boater for weeks, but without success. No one knew the man's name or phone number. I really needed to talk to the eyewitness myself, as the second-hand accounts of his sighting varied somewhat. But here, finally, was someone who had spoken to him directly. So when Smith gave me his name and a number where I might be able to reach him, I felt that the solution to the mystery might be in my grasp.

It took some time, but at the end of January I finally spoke to the eyewitness myself. His name is Bill Scheffey. He lives and works in St. Augustine, he told me, and he doesn't mind being identified as long as his words are not distorted. "I never saw it hit the water or anyhing, just going over," he explains. "They said on the news, 'Offshore boater sees flaming object crash into the sea.' I never saw anything like that." I asked him to tell his story from the beginning.

"I had picked up a 41-footer in Fort Pierce and was bringing it up to St. Augustine," he said. "I was northbound, probably 5 miles east of Daytona Beach. It was a calm night. I didn't have the sails up; I was under motor. Any time I had any decent wind I would put the sails up. I was alone on the boat. I would guess it was about 10 pm give or take 15 minutes. I was looking at the lights there in Daytona and turned around, looking over my shoulder, always checking around for other boats."

Then he saw the meteor. Actually, he heard it first. "It made a swooshing sound," he recalls. "I looked up and could not believe it. I had never seen one that big that close. It was just ahead of me, to the north, about 30 degrees above the horizon. It was traveling from west to east. If you took a grapefruit and held it out at arms-length that was the size of it. It was round. Its color was reddish and white and it was in flames, which were trailing back behind it another grapefruit length. It was strange, because there were sparks, too. It looked like it was following a pretty even path, not a falling one."

When the object disappeared to his right, Scheffey picked up the phone on the boat, called his wife at home, and told her what he had seen. Then about 15 or 20 minutes later, he was hit with the wave--or a wave. "I looked off to my right and saw this wall of water building up right next to me," he recalls. "I would guess it was about 20 feet high, about half the size of the mast which was about 45 feet. But it looked like it was 120 feet at the time. It scared the hell out of me. So I grabbed the helm and spun the boat into the wave. I went up at about a 45 degree angle. It hit me seconds after I first saw it. I didn't see it coming from a long way off. I didn't have a lot of time to prepare for it. Not much time at all. I kicked the helm over and went up over the wave and came down on the other side, like I was on a 41-foot skate-board. Then I looked for the next one, but there wasn't any. It was just that one."

I was impressed by Scheffey's testimony and his reluctance to jump to conclusions. "I heard a couple of days later that a wave had hit Daytona," he said. "I didn't put it together that it might have been the meteor that hit that had caused the wave. I didn't think about that." I pressed him further. Do you now think it was the meteor you

saw that produced the Daytona wave or a freak storm? "I really don't have enough knowledge to say one way or another," he replied. I asked Scheffey if he had the telephone records to pin down the time he had seen the object and spoken to his wife. He said that the boat's owner had those records, but agreed to get in touch with him and find out the time of the call for me. He would call back later.

The geologist, Doug Smith, had heard basically the same story from Scheffey a few weeks after the actual incident. Afterwards Smith and Opdyke had contacted their university public affairs department and had them issue a press release. [11] "Two University of Florida geologists have new evidence to indicate that a giant wave that struck the Florida coast near Daytona Beach on July 3 was caused by a meteorite," it began. The geologists, explained the release, had been contacted by a boater "who reported seeing a large object and hearing a loud 'whoosh' in the sky about eight miles offshore from Daytona Beach just after 10 p.m. on July 3. Smith and colleague Neil Opdyke have estimated that a meteorite about one meter in diameter striking the ocean about 11 miles northeast of Daytona Beach could have caused the 15-foot-high, 20-mile long wave..."

The geologists had released this information in the hopes that publicity about their theory would flush out others who might have seen the meteorite as well. "It was published in the local paper," says Smith, "and it generated an incredible number of weird tales about flying saucers, and from people who wanted to find the meteorite and market it. But we never found anybody else who had actually seen it."

The press release had mentioned that if a large metallic meteorite had settled on the ocean floor, it might be possible to find and recover it. The researchers actually hoped to enlist the Navy's help in locating the meteorite. Smith and Opdyke did, in fact, go back to their Navy contacts and asked if the Navy might contribute some kind of detection effort to find evidence of the meteorite. "We looked at bathymeteric maps," says Smith, "and it's probably only 55 or 60 feet to sea bottom there, 10 to 12 miles out, and we could place its impact to about a four square mile zone. So a search would not have been too difficult. But we didn't get anywhere with the Navy and there was no

way we could do this on our own," says Smith. So the effort was dropped.

Top Secret Check

I wondered if the Navy's top-secret system of underwater listening devices, which literally span the oceans, had perhaps tracked the meteorite as it dove into the water. Since Smith had Navy contacts, I thought he might have asked. He did. Do you know if the Navy detected it, I asked him. "Not outright," he said. "I think we were given an answer in a kind of sideways fashion, with a series of grunts or facial smirks, suggesting 'yeah, we detected it, but we are not telling you we detected it.' So just in the manner of things we were told that we could rest assured that our curiosity was pretty much resolved. I think if it had been otherwise we would have been told."

This was tantalizing, but again, not definitive. I decided to try the impossible: get confirmation of the event directly from the Navy. An affirmative response would clinch the case for the meteorite. So I made a series of phone calls and was finally directed to the agency in charge of underwater surveillance data–the Space and Naval Warfare Systems Command. I spoke to a public affairs person, explained what I was after, and provided the time, date, and place of the event. The public affairs person, Loretta Disio, said she would check and call me back. I wasn't hopeful.

But a little over a week later she called back. "We didn't have any data from that date," she said, "and there is no way to look back and see if it was detected. In any case one of our oceanographers believes that [such an event] would have blended into the background." The spokeperson then expressed the hope that none of this would appear in print. I said that it probably would.

That the Navy would no longer have the data on hand from a year and half before was no surprise, but I found the oceanographer's comment somewhat questionable. I guess it would depend to some extent on the size of the object. The University of Florida press release had mentioned that the object had been estimated as measuring about a meter in diameter. That's about the size of a bushel basket. When I

asked Smith how he had arrived at this estimate, he told me that it had actually come from Eleanor Helin at the Jet Propulsion Laboratory in Pasadena, California. Helin's specialty are asteroids and other extra-terrestrial objects that impact the Earth.

So I called Helin. It seems the wave had sparked considerable interest among some scientists. "I've been very interested in this event," Helin admitted. "Some of my colleagues at Lawrence Livermore are also. I can't give you their names, but you would be blown away by the people who think this is an important event." Helin expressed regret at not having spent more time on it. She, too, had tried to get information out of the Navy, but was unsuccessful. "I still think that the event was probably an impact of a smallish body," she says.

The Other Shoe Drops

Early in February, 1994 the boater, Bill Scheffey, called me back. He had obtained the telephone records from the owner of the boat. It turns out he had called his wife about the meteorite at 10:33 p.m.

"At 10:33 on the night of the 3rd," I repeated for confirmation.

"No, it was the 4th," Scheffey replied.

"The fourth?" I said, stunned. "But the big wave hit Daytona on the third."

"I'm positive it was the night of the fourth, because I saw fireworks that night."

"Are you sure? People have a tendency to set off fireworks early when the fourth falls on a weekend."

"No," answered Scheffey. "I'm sure it was the fourth. I drove down to pick up the boat in Fort Pierce on a Friday and got home on Sunday at 2 pm. That would put me off Daytona on Saturday night."

"That was the fourth," I repeated, obviously disappointed.

"I'm sorry," said Scheffey. "That blows your whole theory."

Well, yes, Smith and Opdyke's theory, and my conviction that they were right, that the Earth sometimes suffered minor damage from the impact of extraterrestrial objects, and that this Daytona event was a case in point.

So I called Smith and gave him the bad news. "I'm really disappointed," he admitted, "because in my two conversations with him and in my conversation with the man who was my link to him, it was always a discussion about the 3rd of July. There was never any question in my mind that we were talking about the same day. I'll be darned. That scrubs the only evidence we have for a meteorite then."

Indeed. So the meteorologists–List, Thieke, and the rest–must be right; it must have been the weather, a squall-line surge that had caused Daytona's big wave. But Smith wasn't willing to concede this; for him, the big wave had become, once again, a mystery.

Frankly, I'm still puzzled, too. Even if I accept the weather explanation for the big wave that hit Daytona Beach on the 3rd of July, I find myself unable to dismiss Scheffey's testimony, which would indicate that on the following night, the 4th, a meteorite, unseen by anyone but this boater, or perhaps dismissed by some as a fireworks display, hit the waters of the Atlantic, and produced another wave that nearly swamped his boat but had essentially no effect on Daytona Beach itself.

Two nights. Two waves. One squall-line surge. One meteorite. A most curious coincidence. It all leaves me quite astonished at the multitude of the world's natural wonders–and how little scientists are in agreement about them.

Footnotes

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5. "Scientists study renegade wave," *Daytona Beach News-Journal*, July 7, 1992.

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10. "The Daytona Beach 'Large Wave' Event of 3 July 1992," by Robert J. Thieke, Robert G. Dean, and Andrew W. Garcia, *Proceedings of WAVES '93*.
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CARGO OF THE GODS?

By Paul Rydeen

The cargo cults of the South Pacific islands show striking similarities to certain spiritual currents surrounding UFOs and ufology, and I intend to demonstrate this relationship with the following short history of cargo cult evolution. Though many religious sects share similar practices, it seems to me that cargo cults and saucer groups are more closely related, having occurred fairly recently in direct response to outside stimuli. With both the UFO phenomenon and the cargo movement, we have a chance to see what the lasting effects of contact with a higher intelligence may be. In a sense some New Age groups may be seen as little more than cargo cults themselves.

With the exception of an isolated cult in Samoa now dated to the 1830s, the cargo phenomenon really began to proliferate only after 1871 when the Russian Baron Miklouho-Maclay became the first white settler in the area. The Baron and his crew settled in Madang, New Guinea, and were taken to be the long-dead ancestors of the people returning as gods. As with most seafaring cultures, the dead were thought to depart in great boats sailing west toward the setting sun. People were born when the tide was coming in and died when it went out. Visiting ships' crews would naturally be received as gods, which the natives of the Pacific islands considered their ancestors to be.

The Baron presented the awestruck islanders with gifts of western goods or cargo such as knives, axes, nails and cloth, and introduced new food plants which were all well received. The white men were seen as deities embodying the ancestors who had returned with gifts of cargo invented especially for the natives. It seems the settlers did little to discourage this myth and even encouraged it with such practices as hiding their own dead. The departed white men had returned to heaven (i.e. Europe), the natives were told. Gods don't die.

The Baron left and German settlers arrived in 1884. At first the natives assumed all would be with the Germans as it had been with the Russians, but by 1900 it became clear that the Germans were not interested in fair trade with the islanders. The Germans established large plantations on the coasts and paid very poorly for labor. The natives came to see them not as gods but men who had accidentally discovered how to control Kilibob and Manup, the two brothers who were cargo deities identified with the Baron.

Long worshipped as gods, Kilibob and Manup are probably historical persons dressed up mythologically. Kilibob and Manup are credited with having founded the cultural systems in use in the various islands prior to European rule, systems which left the majority equally wealthy. The misappropriation of wealth under the Germans was now obvious in everyone's eyes, and it was during this period that native uprisings began. The Germans weren't shy about using their newly-introduced rifles. In 1904 a large uprising in Madang was squelched by the white men, and in 1912 the situation was again so bad that many of the islanders were exiled.

The third phase of the cargo movement coincided with the end of World War I in 1918. Most of the German islands were given to Australia, and as German rule was phased out, relations improved somewhat between the natives and the whites. Proselytizing Christians were welcomed, and it was soon decided that the Christian God and Jesus lived in Heaven (now a suburb of Sydney) with the ancestors, where they all spent their time making cargo. Baptism and devout adherence to the forms of Christian worship were sure to bring the ancestors with ships full of cargo to the islands. Early cargo devotees had watched for a big canoe, but by this time they knew to keep an eye out for sails. In 1919 the first steamship made its appearance in the area, being the latest vehicle for delivering cargo.

This harmonious coexistence dwindled off over the next twenty years as the natives saw things getting no better than they had been under the Germans. Missionaries became despised creatures, openly opposed for their lies. God and Jesus were really names for Kilibob and Manup respectively, who were being held prisoner by the

whites in Sydney. Services held in formerly Christian chapels were again designed to honor the ancestors and bring their return with dancing, feasting and offerings of food. By the time World War II started, virtually all dependence on Christianity was gone; the traditional island gods had now been declared full-fledged cargo deities.

A major development in the cargo movement came in the early 1940s when Japanese forces occupied many of the Pacific islands. The natives had been mistaken; the Japanese were the true ancestors and now they had come to drive out the whites, who for the first time were barred from certain meetings meetings where messages of a presumedly psychic nature were now being received. These messages encouraged fervent prayer, intense dancing akin to the frantic whirling of Sufi dervishes, and the use of the mildly hallucinogenic kava. As it turned out, the Japanese were more than willing to fulfill this role for the islanders, promising them abundant cargo if they would help drive out the white men.

The Japanese occupation didn't last long, and soon the natives were amazed to see black men like themselves fighting alongside the whites in the Allied armies. It was very assuring to the natives to meet these American blacks, who they could see obviously had the secret of cargo. They too could learn the secret, if only they did as these soldiers were doing. The soldiers were friendly, giving out gifts of chocolate bars, beer and other foodstuffs, and leaving behind abandoned buildings and equipment. The ancestors would return in airplanes, and to this end the natives abandoned their docks and wharves for newly constructed bamboo radio shacks with grass roofs, wooden antennae and vines for power transmission, ersatz airports with loose dirt runways that would look right at home on an episode of "Gilligan's Island." Templar crosses may be found all over the area in imitation of the American Red Cross.

The natives sit for hours in these shacks even today, or in their chapels, repeating phrases into their imitation radios they had heard the soldiers use to bring the mighty birds: "Can you hear me?

Roger and out." Perhaps they even received messages, just as early telegraph operators recorded detailed transmissions which were never sent. This is a subconscious process brought on by hours of monotony straining at the headset, akin to automatic writing or channeling. The source of these messages seems to be some facet of the recipient's mind as yet unrecognized by western psychology–or perhaps even an outside "intelligence." Who can say?

In Vanuatu, New Hebrides, the John Frum movement arose directly after the war. Frum was said to have been a black G.I. whom the natives decided was King of America. His field jacket is still in the possession of one faithful group. All the cargo cults now believe the ancestors will arrive by airplanes, as numerous models in every cargo chapel attest. Some groups believe that the ancestors are even more advanced than the whites, and will return in "flying houses" (whatever that might mean).

It can only be a matter of time until it is realized that the ancestors will return from the heavens in their flying saucers, spreading cargo far and wide. I know for a fact there are white saucer groups in Australia, and there have been contactees in the area since the very beginning of ufology. What a magnificent chance we have, to watch the development of two parallel traditions in this age of technology, at first isolated and almost mutually exclusive, but now soon to inevitably and irrevocably merge; what an honor we have to witness the birth of a brand new mythos.

Since the war the cults have been fairly stable. Leaders come and go, but with the possible exception of the legendary John Frum, none have achieved messianic status (though one Vanuatu group worships Prince Philip). Those groups who do retain Christian influence are more akin to the Pentecostalists with their healings, speaking in tongues and other manifestations of man's spiritual side. In their own words the islanders merely want to be wealthy like the white men. Although certainly not poor by absolute standards–none starve or want for shelter or clothing–who wouldn't be tempted by such trinkets as portable radios, small handheld appliances, etc.? Many destroy their

crops after the manner of potlatch, presumably to show the gods how poor they really are.

Their hope, as absurd as it may seem to westerners who think they know the secret of cargo, is a driving force much like the expectation of a Messiah – a hope they share with the flying saucer contactees. Though not literally true, perhaps one day it can be made so. I would like nothing more than for the ancestors (read: ancient astronauts, Space Brothers, et al) to return from above and shower us all with more material wealth than we could ever know what to do with; a golden age of brotherhood and spiritual satisfaction would be upon us.

Just as proof positive of intelligent life elsewhere in the universe would have a profound effect on every nation's culture, even a relatively minor arrival of cargo on the islands would have profound changes on the cults, changes which would be quite exciting to observe. For once the planes (or saucers) would land at the islanders' airfields instead of being diverted by the white man's conflicting radio signals, to mistakenly land at his. Do you read me? Roger and out.

Cargo cults and saucer groups are alike in having a millenial ideal; the forms this ideal takes are remarkably similar. They both have a non-personal entity (the ancestors and the Space Brothers) expected to manifest via mechanical vehicles (planes, ships, UFOs) bringing cargo (chocolate bars, radios, and postnuclear peacekeeping technology) and a just salvation. The impetus for both groups is not necessarily the material goods, but the status they bring. Cargo devotees merely want to turn the tables, as it were, and restore a civilization they perceive to be ill. Saucer contactees don't literally yearn for cargo, but more often for knowledge or wisdom. The changes they desire are sometimes economic, as with cargo, but are also pacifist, environmental and spiritual. In short, they too want to heal our cultural sickness by making us all equals. They want someone to enforce

nuclear peace, do away with economic disparities, fix the environment, and return us to a Golden Age.

One of the most striking features of these philosophies is the "alien" nature of their saviors, echoing gnostic sentiments of two millenia ago. Unlike the usual messianic movements, cargo cults and contactees are singular in expecting salvation to come from the outside rather than arising from within.

The cargo cults arose in response to direct outside influence: colonization and subjugation by an advanced intelligence. So who or what is colonizing us? Are extraterrestrials actually contacting us, or is the cargo parallel inaccurate in this instance? I'm not saying that we are being visited by aliens; perhaps the whole thing is a psychological response to conditions similar to those that produced the original cargo cults. The "higher" intelligence may only be one more unknown aspect of our own minds, or it may be a defense mechanism against something we don't understand or can't accept. Then again--as the contactees have been telling us all along--it may be the next step in human evolution.

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THE FIRST EXTRAORDINARY CLAIM

by Martin Kottmeyer

"It is necessary to know how to make ourselves ridiculous, and not only to others but to ourselves."

-Miguel de Unamuno

I know something you don't know. It's a naughty little secret and astronomers would just die if they knew the truth. But the fact of the matter is that somebody forgot to prove the Earth is round. I know. You thought this was all settled centuries ago. But you can't recall anyone ever telling you who proved it, can you? The names Parmenides and Philolaus probably mean absolutely nothing to you. Or maybe you heard their names associated with Greek history or philosophy. But certainly you didn't know they are considered by historians the likeliest persons to have invented the concept of a spherical Earth.

Amazing, isn't it? One of the most revolutionary discoveries in the history of astronomy and nobody ever bothered to tell you who made it. Or how. Actually, they might have told you how. It's just that they got it wrong. It was not made by watching ships dip below the horizon, nor by travellers tracking the drift of distant stars. Nor was it a simple case of "Eureka!"

There is a very good reason nobody talks much about Philolaus and Parmenides. They were not--to put it charitably–scientists as such. But, as you will see, knowing who these guys were definitely

colors our ultimate understanding of how the idea of a globular Earth came into being. And the subsequent handling of the idea by Plato, Aristotle, Copernicus and others, you will be annoyed to learn, represents less than inspiring examples of rationality. I eventually had to face facts. Nobody has bothered to give a good, solid rigorous proof of the globular Earth idea. No book even adequately chronicles the history of the advance of belief in a spherical Earth. Dozens of books have been written on the revolution wrought by Copernicus which tore the Earth from the center of the cosmos, but of the earlier revolution that placed man on a sphere suspended in the void, only passing references in histories of astronomy or Greek philosophy can be found.

It was that very poverty of wonder about such an amazing break with common sense which spurred me to dig into this subject. I first suspected that it all happened too far back in time for history to record its discovery. Fortunately, that pessimism proved to be unfounded. But the mystery deepened. How did the story of the discovery of the Earth's sphericity become, as it were, terra incognito for astronomy writers? My acquaintance with historical scholarship had to be broadened. Tracking back along the footnotes the picture began to fill in. I began to understand the ambiguities in the records, the subtle points of contention, the unlearning of modern concepts necessary to follow the logic of Greek thinkers, and, yes, the necessity to drop some of my unrealized prejudices.

One of these was my unthinking acceptance of the common view that geocentricity was an egocentric prejudice on the part of pre-Copernican thinkers. It was more an outcome of the theory of forces Stoics had to develop to suspend the spherical Earth in a void. If the Earth was not pressed into a sphere by forces operating towards a central point in the Earth, they would be at a loss to understand why a lateral motion of the Earth was not apparent. In a funny sort of way, the sphericity revolution delayed the Copernican revolution.

Anyway, by the time the picture got pieced together, I began to see why no one was very vocal about it. It is not a very pretty sight for the forces of reason. Admittedly, it might simply be that no one beyond a few specialists cared enough to learn the full story. It's hard to decide which is less damning–tact or incuriousness.

To learn how the idea of the spherical earth came into being we have to turn to the history of the early Greeks. It is here at the dawn of Hellenic civilization that the erstwhile revolution in our image of the figure of the Earth begins to take shape. It is important to understand that by this period in history mankind had already lived in a state of civilization for thousands of years. We are not talking about people who have just come off the plains of Africa from chasing down wild animals for lunch. Agriculture was well developed and political systems had been organizing the activities of people for hundreds of generations. Observational astronomy had been cultivated by the priesthoods of both the Babylonian and Egyptian civilizations and these fruits of nascent science were accessible to the Greeks. There is no hint that anyone in this immense span of time had yet considered the possibility the Earth could be a ball suspended in space.

In the earliest extant Greek writings, the Homeric poems and the works of Hesiod, we can still see evidence that the prevailing image of the Earth consisted of a flat circular disk. Though it is not stated explicitly, the Earth had to be thought flat for Poseidon to be able to see Odysseus at Scheria from his vantage on the mountain of Solym. The ability of Helios to descry his cattle on Thrinakia would also be inappropriate if it was common knowledge that the curvature of the Earth prevented such feats. When Achilles' shield is described in the eighteenth book of the *Iliad*, Oceanus forms the rim. Early Greeks presumably understood from this that the shield and the world shared the same figure–flat, circular, and surrounded by the world-ocean.[1]

Early Greek philosophers of the Milesian school explicitly articulated their shared belief in the flatness of the Earth. From the context of Aristotle's accounts of early philosophical beliefs, it is clear Thales was a Flat-Earther. Thales believed the Earth floated on the surface of water much as wood and similar things do. There it rested stably. Since the Greeks believed they were surrounded by a world-ocean, this is a very understandable supposition, even if they surely realized rocks and dirt were not in the habit of floating. According to sources in the doxographical tradition, Hippolytus and Pseudo-Plutarch, the Milesian named Anaximander, held the form of the Earth to be moist and rounded like a stone column, that is, cylindrical, with

Anaximander introduced a startling cosmographical idea--an Earth suspended freely in the center of the universe. Prior thinkers had the planet securely on the bottom of the cosmos or slightly elevated on pillars of other supports. It was a daring and highly strange feat of imagination.

its depth one-third of its width. Lastly, we know from Aristotle's list of Flat-Earthers, that Anaximenes of this same school of nature philosophers believed that the Earth, like all celestial bodies, was flat and borne upon the air because of its flatness.[2]

Though the Milesian school did not offer any special surprises with regard to the shape of the Earth, Anaximander introduced a startling cosmographical idea. His Earth was suspended freely in the center of the universe. Prior thinkers had the Earth securely on the bottom of the cosmos or slightly elevated on pillars or other supports. It was a daring and highly strange feat of imagination. It is not clear why he felt it was necessary. The way he sought to suspend the Earth in the middle vaguely resembles an act of chutzpah. As Aristotle understood it, it remained there because of similarity or symmetry. "A thing established in the middle, with a similar relationship to the extremes, has no reason to move up rather than down or laterally; but since it cannot proceed in opposite directions at the same time, it will necessarily remain where it is." Hippolytus says it a little more simply, "The Earth is aloft, not dominated by anything; it remains in place because of the similar distance from all points." With the Earth launched into the void, thinkers were free to play in a wider universe of ideas.[3]

With the Earth established in the center of the universe by symmetry, it is a simple step to have this symmetry reshape the figure of the Earth. We cannot be sure this step was taken. There are several possible ways in which the spherical Earth concept could have been arrived at. But the argument for the sphericity of the Earth made by Aristotle seems to suggest this idea of symmetry was a significant consideration by his time. Possibly, it was important from the very beginning. Anaximander's innovation, for our purposes,

represents a beginning point in the historical record to look for the first globularist. Any cosmologist following him could have easily made the next step.

The opposite endpoint in the search for the first globularist is Aristotle. There is no ambiguity on the point that Aristotle believed the Earth to be a sphere and that Pythagoreans preceded him in this belief, by his account. A less certain cutoff date narrows the search by at least another century. According to Plato's *Phaedo*, the philosopher Socrates had a burning desire to learn from the writings of Anaxagoras which of two figures of the Earth he believed in and why the Earth was at the center of the universe. The words describing these two figures can be understood as flat and spherical. But J. S. Morrison points out that it could also be understood as disk-like and hemispherical, or disk-like and rectangular. The latter two forms appear in Herodotus with laughter directed to the round form of the Earth. I share the skepticism Charles Kahn directs to these latter interpretations. It doesn't seem all that burning a question to know which of two forms of the flat Earth Anaxagoras favored. D. R Dicks argues on several considerations that while sphericity may not be explicitly affirmed, it is completely untenable that Plato had anything else in mind but a spherical Earth in his cosmographical myth. I consequently reject an origin of the concept after Socrates' youth (c. 450 B.C.).[4]

This date is sufficient to eliminate E. Frank's candidate for the first globularist, Archytas. Aspects of application of geometry to astronomical problems in his work seem adequate to label Archytas a globularist. With his life beginning at least a half century after Socrates was looking to Anaxagoras to resolve the question of the figure of the Earth, he was doubtless not the first globularist. Why anyone would want to date globularism to Archytas' time is itself a fascinating question having to do with a historic paradox. It bears strongly on how globularism began. All that in its proper place–later.[5]

Pythagoras is sometimes cited as a candidate for the label of the first one to discover the sphericity of the Earth. He comes upon the stage of Hellenic civilization around 532 B.C. when he settled down in Croton and began a school. His life thus fits the requisite historical period. Historians aptly term Pythagoras a legendary figure. They have no easy task filtering out which aspects of the many tales told

about him are true from the mystifications added to his life from his admirers. We have no firm evidence what Pythagoras himself believed the figure of the Earth to be since the Pythagoreans taught within an oral tradition and none of his followers before Philolaus wrote their cosmological beliefs down. There is a passage from Diogenes Laetius' writings quoting the second century polymath Favorinus who credits Pythagoras with saying the Earth is round. The passage also notes that Theophrastus credits Parmenides with saying the same thing. As evidence, this is rather weak. It may only mean this belief was a tenet among Pythagoreans and attributed to Pythagoras as a matter of tradition. Skeptical commentators like Dicks regard it as improbable that Pythagoras believed the Earth to be a sphere. W. K. G. Guthrie had the impression that the writings of Aristotle and Alexander Polyhistor pointed to the last two generations of Pythagoreans as the first to teach the Earth is spherical. But the late date of Favorinus' attribution makes it far from ideal testimony. It is probably relevant to note that Aetius and his unknown source ascribe to Pythagoras and his followers, after Thales, the view that the stars were distributed in three belts or "roads" in the heaven. This view was an ancient belief of the Babylonians. Anaximander also seems to have held to this view and this explains perhaps why his principle of similarity did not lead immediately to a spherical Earth. If the universe is not spherical, but banded, a disk-shaped Earth is quite logical. Pythagoras would equally have had no compelling reason to postulate a spherical Earth with his cosmos similarly banded.

This leaves two prime contenders for the title of the first globularist--Parmenides and Philolaus. Both are credible candidates insofar as their lives span the requisite years before Socrates' maturity. In the case of Parmenides there even exists testimony that Parmenides conversed with Socrates when the latter was a youth. Both are strongly allied with the Pythagorean tradition, a necessary prerequisite based on Aristotelian arguments against the Pythagoreans on which hemisphere of the Earth is upper and which is lower with regard to the universe. As Dicks observes, this argument is sufficient to regard Pythagorean belief in the sphericity of the Earth a certainty at

some point in their tradition. Parmenides is known to have revered Ameinus Diochaites, who was of the Pythagorean school. Philolaus, on the other hand, is clearly within the Pythagorean tradition since he was the teacher of the school at Thebes.[7]

The argument for giving Parmenides priority for globularism turns on whether Theophrastus' considerable authority can be regarded as definitive. The word used to describe Parmenides' Earth can be translated either as circular or spherical. Even if we accept the intent of the passage in Diogenes Laertius as showing a priority dispute between followers of Pythagoras and Parmenides, it could be based on error. Parmenides certainly believed the universe was spherical. Theophrastus might have mistaken Parmenides' figure of the universe for his figure of the Earth. It would hardly be the first error in the doxography, or collection of written origins. One source credits Anaximander with believing the Earth to be spherical, but direct quotes from the fragments of Anaximander decisively refute this claim. Surviving fragments from Parmenides unfortunately do not quote him on the figure of the Earth.[8]

An interesting psychological case can be made for Parmenides' priority. His work, "On Nature," describes a vision wherein he acquires "the unshakable heart of well-rounded truth" from a goddess. She further reveals to him that Being is defined on all sides "like a well-rounded sphere." Further, "it is equally poised from the center in all directions; for it is necessary that it should not be greater in one direction and smaller in another." Such beliefs would certainly put him in a receptive framework to hit upon the notion of a spherical Earth.[9]

On the other hand, "On Nature" has Parmenides meeting the goddess by journeying to the threshold of the gates of the paths of Day and Night. The phrase harkens back to the entrance of the Underworld in Hesiod. Traditional topography relates this to the end of the Earth. A spherical Earth shouldn't have an end to it. Morrison has also argued that the system of stephani, based on hollow rings of varying breadth and attributed to Parmenides, only works if the Earth is flat with levels diminishing in size in the fashion of a hemisphere. [10]

Yet another argument against Parmenides being a globularist is that Empedocles, who was strongly influenced by him on most

matters, was a Flat-Earther. Any doubt on this point was scotched by Stephen Tigner when he pinned down the mechanics by which Empedocles sought to explain the levitation of the Earth. Tigner discovered that the twirling ladle mentioned by Empedocles in his text refers to an observable phenomenon wherein fluids can suspend heavier substances by means of heliacal updrafts. This method of suspension is quite unlike any offered by globularists and is a perfectly sensible way to speculate about how a flat Earth could be suspended in a spherical cosmos. It would be curious that differences between two Eleatic philosophers like Parmenides and Empedocles on such a matter as the figure of the Earth would have been overlooked by Aristotle or other commentators.[11]

The case for Philolaus is less problematic but admittedly flimsy. Surviving fragments of Philolaus' writings do not directly reveal his view on the figure of the Earth. His student, Archytas, however, was evidently a globularist and it is reasonable to suppose he inherited the idea from Philolaus. No authority directly credits it to him however. As noted earlier, the achievements of Pythagoreans were traditionally credited to Pythagoras and it should be noted that Aristotle himself never bothered to differentiate the views of individual Pythagoreans but treated them generically. With the Eleatic philosophers he took more care. Philolaus was the first to write down the cosmological views of the Pythagoreans and it is reasonable to suppose he was introducing some innovations of his own.[12]

The psychological case for Philolaus is not as suggestive as in the case of Parmenides. Pythagoreans in general had an adoration for the sphere. Parmenides would have shared this belief. Unlike Parmenides, however, Philolaus did not believe the Earth to be at the center of the universe. He believed in the existence of a Central Fire around which the Earth and all the other bodies of the cosmos circled. Philolaus could not have derived the sphericity of the Earth by the principle of symmetry. Symmetry, however, was a major part of the argument for the spherical Earth in Aristotle's time. If Philolaus began globularism, symmetry must have been added later. While it could have been added to pre-existing globularist belief, it would be more believable if it had played a role from the very beginning.[13]

Guthrie argues there were probably two cosmological systems in vogue among the Pythagoreans. The one offered by Philolaus with a Central Fire; the other a geocentric scheme with an Earth possessing a fiery core. It was likely an unnamed Pythagorean beholden to this alternate view who originated the spherical Earth idea. The cases for Parmenides and Philolaus are both less than ideal. Scholarly opinion seems to show a slight favoritism towards Parmenides mainly because Theophrastus is highly regarded as a doxographer. I lean a little more towards Philolaus as being closer to the action. Had the whole of his writing survived I would not be surprised if he would have mentioned a close colleague in his school coming up with the idea. I also would not be surprised if Parmenides' belief in a spherical cosmos influenced or was influenced by this unknown Pythagorean. Much as Charles Kahn prefers to view Anaximander as representative of a stage of Ionian thought, I prefer to give Parmenides and Philolaus equal billing for priority. They may not be the actual originators but they do represent personifications of the manner of cosmological thought at that period of Greek philosophy.[14]

Having answered the "who" question, let's now turn to the Big Question at the heart of this inquiry: How did globularism begin?

Opinion ranges all over the place. Just as no work survives which says, "I did it," none survives to say, "Here's how I did it!" It is a matter of inference and speculation. Some speculations, however, are demonstrably poorer than others. This is particularly true in cases where the writers take phenomena adduced by contemporary globularists to be proofs of their doctrine and reason backwards that they must have played a role in the genesis of the spherical Earth idea.

Modern globularism accepts that the displacement of stars and the displacement of Sun shadows as one travels north or south is evidence of the sphericity of the Earth. Astronomy historians J.L.E. Dreyer, A. Pannekoek, and Otto Neugebauer think this phenomenon was the spur to globularism. Dreyer's faith is frankly dogmatic. He writes, "We cannot doubt that the true figure of the Earth was first made clear through the reports of travellers about certain stars becoming circumpolar when the observer proceeded north of the Euxine,

while a very bright star (Canopus), invisible in Greece, was just above the horizon at Rhodes, and rose higher the further the navigator went south." I was fairly shocked when Neugebauer, the titan of mathematical astronomy, echoed this sentiment. He based it on the displacement of stars visible when travelling between Greek settlements of the Nile delta and the Crimea. Pannekoek, rather lazily, expresses his trust in such a rational course to globularism by remarking, "this knowledge quite naturally arose among observant Greek navigators." I don't buy this reasoning in the slightest. Travel was hardly novel in the fifth century B.C. Egyptians, long before, had travelled more than sufficient distances to observe stellar displacement across latitudes. They weren't globularists. Polynesian navigators used stellar displacement in guiding their travel between islands. They remained Flat Earthers. Chinese cartographers likewise used stellar displacement in their mapmaking. They never connected it to the figure of the Earth until Europeans introduced the idea. It is just not a simple deductive step from stellar displacement to concluding the Earth is curved. There is no reason to assume the Greeks were uniquely intuitive in divining the need for a different figure to the Earth as an explanation for this phenomenon.[15]

Another proof of the sphericity of the Earth accepted by moderns is the curvature of water apparent in the blocking of distant objects like ships or islands. This would seem a simpler and more direct path to globularism. Textbook writers and science popularizers favor this route. But scholars uniformly avoid this idea, and understandably so. Not a word of disappearing ship hulls or sinking islands appears in Aristotle's arguments for the sphericity of the Earth. It is almost certainly a later accretion to globularist doctrine. The occultation of distant objects by the curvature of water is an exceedingly slight phenomenon compared to the diminution of images by perspective and image distortion by mirage effects. Anyone happening to observe the blocking of distant images likely would not immediately spring to the interpretation of it as due to the Earth being a giant ball. It is one thing to interpolate curved water from belief in a spherical Earth; it is quite another to extrapolate the whole figure of the Earth from a tiny bulge in the water. It is nearly impossible to accept that globularism sprung from such an induction.

The shadow cast on the Moon during lunar eclipses represents another proof accepted by moderns. Here the circumstantial evidence for involvement is far superior to the other proofs. While eclipses had been observed for centuries before the Greeks, the recognition that they represented shadow-casting events came around the same time as the origin of globularism. Sir Thomas Heath rejects the association between these two discoveries since the person who spotted the shadow-casting nature of eclipses was Anaxagoras. Anaxagoras was certainly a Flat Earther. This is not an incongruent position since a disk-shaped Earth would cast a curved shadow as well as a sphere. This is, in point of fact, quite so satisfactory an explanation that one may well wonder why generally unsophisticated astronomers such as the Greeks would feel the need to posit sphericity from a curved shadow on the Moon. Perhaps they didn't. Even so, it must be granted that Heath's rejection does not take into account the appropriation of Anaxagoras' discovery by a Pythagorean to reach this globularist conclusion. It also should be noted that the eclipse-shadow argument is used by Aristotle in proving globularism and thus could have played a role at its earliest existence.[16]

My own impression is that it takes a rather hefty leap of imagination to jump to the sphericity idea solely from the slight arc visible on the Moon in eclipse. While I can readily see how this phenomenon could be used to reinforce a pre-existing belief in globularism, it requires an unusual mind to first recognize that the arc can be extrapolated to yield a circular shadow and then understand the necessity that the curved figure be curved in three dimensions from a series of eclipses. Those who have not witnessed a lunar eclipse do not easily appreciate the difficulty in interpreting the eclipse experience since one must mentally cancel out the effect of the Earth's rotation in arriving at the globularist's understanding of the event. Dicks evidently felt that apart from other arguments by Aristotle, the eclipse demarcation line strictly proves only the curvature of the Earth's surface. Neugebauer goes even further and calls Aristotle's lunar proof a "pseudo-argument." Since the shadow falls on a spherical moon, a curved arc proves nothing. Thus, even if the eclipse phenomena did play a role in the genesis of globularism, its role was not fully rational. Interestingly, only one scholar, S. Sambursky, has felt there is "no doubt" the

There is only one other major proof of globularism: the observation and recording of the Earth's sphericity from a vantage point in space. Reputable scholars would never in their right minds suggest this could have been managed by the ancient Greeks.

sphericity of the Earth was inferred from lunar eclipses, and then, only in part. The principle of symmetry formed the other stimulus. This is a respectable position, but I feel it errs in not clarifying the likelihood that symmetry would precede the eclipse argument.[17]

There is only one other major proof of globularism: the observation and recording of the Earth's sphericity from a vantage point in space. Reputable scholars would never in their right minds suggest this could have been managed by the ancient Greeks. But it is amusing to note that ancient astronaut fanatics have speculated that the Greeks learned of sphericity from friendly extraterrestrials. As yet, they have not, to my surprise, translated Parmenides' vision into an extraterrestrial encounter. It would be a simple matter to argue that the sparking chariot is a flying saucer, the goddess is an extraterrestrial, and the Underworld is the Moon, and then from this argue that Parmenides learned of the sphericity of the Earth by direct perception from space. It would probably convince ancient astronaut buffs, but as the existence of extraterrestrials has yet to be demonstrated to the satisfaction of the scientific community, it must consequently be dismissed from serious discussion.[18]

This exhausts the natural phenomena from which one might rationally derive the spherical Earth concept. The alternative is that globularism came into being irrationally, by accident. This is not a new of radical suggestion. But it is little known outside the writings of specialists and is rather shocking to newcomers.

Foremost among the irrational concepts which likely gave rise to globularism was the principle of symmetry or similarity. The Earth is spherical because the cosmos is spherical. The probability is high that this was the line of reasoning because the concept of

the spherical universe appears almost simultaneously with the concept of the spherical Earth. Dicks observed that with Parmenides we have the first completely authenticated instance of a person applying the concept of sphericity to the universe as a whole. Even if Parmenides did not himself come to conclude the Earth was spherical, it is easy to see how a contemporary would take Anaximander's principle of similarity, add it to Parmenides' spherical universe, and realize the Earth should more reasonably be considered spherical than disk-shaped. The reasoning could not be simpler. The big problem, however, is that the universe is not spherical.[19]

More specifically, the stars do not form a rigid shell. To think so is, at bottom, a belief based on perceptual illusion. The rotation of the Earth yields an apparent motion of the stars which traces circles around the Earth. It is reasonable to assume that the collective motion of stars is due to their participation in the motion of a sphere, especially since stars do not manifest readily observable motions relative to each other. Indeed, the belief is a praiseworthy improvement over more ancient conceptions of the sky as a ceiling or series of bands. Nevertheless, it was a fallacious process. Stars are scattered at great distances in reality and do not form a sphere. Equally they cannot collectively manifest a hypothetical force of symmetry or similarity on the figure of the Earth when there is no center to the universe for it to act upon. The belief that the Earth was at the center was another perceptual illusion allied to the observation that stars apparently move around us and do not seem to move laterally in a collective fashion. Distances in the universe are too great for a lateral motion to be apparent. In reality, the Earth does possess lateral motion relative both to the visible stars and to the cosmic radiation background formed by the Big Bang. The Earth's figure seems totally unaffected by the asymmetry of energies it receives from the edge of the universe.[20]

There are other ways the figure of the Earth could have come to be thought spherical. It is widely accepted that the Pythagoreans had a passion for mathematics. One of the most noteworthy aspects of this passion is the Pythagorean belief recorded by the doxographer Diogenes Laertius that "the sphere is the most beautiful of solid figures." It might simply be the Pythagoreans had an obsession with spheres and would have applied it to the figure of the Earth even without

Anaximander's principle of cosmic similarity. Perhaps there was a reason for Pythagoreans to believe the Earth should partake in the most aesthetic form. It would not be the only time in history that a type of theological argument took precedence over reason. It could also be that Pythagoreans beholden to Philolaic cosmology felt that Zeus, who occupied the Hearth, Watchtower, Throne, or House represented by the Central Fire, would only surround himself with round, divinely shaped forms and thus bestowed the shape to all celestial bodies, including the Earth. But maybe divinity played no part and the Earth was thought to be round because they felt spheres were appropriate to mobile forms. Since the Central Fire meant the Earth could not be at the center, it could not be flat and at rest. Maybe the grouping of the Earth with other celestial bodies suggested to them that the sphere was the mediocre form of celestial bodies and thus the likely shape of the Earth. Unlike symmetry, these arguments lack any support in Aristotle's account of globularism. They must be accorded a dubious status among the speculative possibilities.[21]

I believe these considerations are probably adequate to pinpoint that the likeliest route to the spherical Earth idea was the fundamentally fallacious argument of similarity. But some rationalists might argue that the Pythagorean habit of thinking in terms of circles and spheres might have merely acted as a cultural influence, and that surely more rational considerations were involved even though proof is unlikely. How can we be sure Parmenides and Philolaus weren't deeply contemplating the lunar eclipse shadow or the displacement of stars and hit on the correct answer by intuitive deduction, but only then used the argument of symmetry as a handy rhetorical justification? The Greeks, after all, were practically the originators of reasoned philosophic discourse. Couldn't it be that the Greeks were the first to think of the spherical Earth because they were the first to be so reasonable, unlike the deeply mythic style of thought found in ancient and non-Western cultures? If globularism was fundamentally irrational, it would have surely turned up among some other peoples--not the Greeks.

Sounds good. There are, however, two rather devastating considerations that clinch the case for globularism being initially a flagrantly irrational doctrine.

Exhibit A: Democritus was a Flat-Earther. Historians are virtually unanimous in their praise for Democritus. He was the giant in the annals of early science. No figure in Greek culture so closely fits the image of the rational scientist. The creator of atomism, an antisupernaturalist, and an investigator of nature who got the right answer more often than anyone else, Democritus was Greek philosophy's prize thinker before Aristotle. If the earliest globularists had a good sensible argument for their belief, why did Democritus remain a Flat-Earther? It is such a profound conundrum, that the scholar E. Frank decided the answer must be that globularism itself must not yet have existed. Fiddling with the historic record, he developed an argument that Archytas was the first globularist. As noted earlier, it has not survived scrutiny. But it does underscore the respect scholars have for the opinions of Democritus. No rationalist of the calibre of Democritus could have failed to understand what the arguments for globularism were. His rejection of many conventional beliefs makes it unlikely mental inertia or conservative principles played a role in his Flat Earth belief. Kahn makes the point that Democritus was the type to favor the evidence of the senses and thus would be resistant to rejecting the evidence of his own eyes that the Earth was flat, unless countervailing sense data existed. If globularism was advanced solely by considerations of symmetry, Democritus would likely be unconvinced. Whether lunar eclipse considerations would sway Democritus if they were present is interesting to speculate on, but I rather doubt it since his disk-shaped Earth would probably explain the curved shadow to his satisfaction. The conundrum is thus soluble. Democritus rejected the spherical Earth idea because he likely thought it was flagrantly irrational.[22]

Exhibit B: The first globularist was not a Democritus. None of the possible originators of the spherical Earth concept seem to be the sort of thinker to make an insightful advance in natural science.

Parmenides' work, *On Nature*, despite the promising title, cannot by any stretch of the imagination be regarded as a scientific monograph. Some, charitably, I think, call it a work of poetry, but mysticism has been a better description. In brief, Parmenides tells of taking a journey to the underworld where he meets a goddess who reveals to him the truth of the sphere of Being. Such an experience is

recognizably a shamanic journey. Parmenides describes the manner of the journey as the "much heralded way of the goddess." Such a phrase, in conjunction with the visionary character of the journey, suggests the speculation that, like many shamanic experiences, the vision may have been drug-induced. The journey to a supernatural being who imparts revelations is a frequent motif of drug visions.[23]

The goddess, as an entity of the underworld, is appropriately termed a daemon. If a fragment of text has been correctly identified as referring to the goddess, she is explicitly labelled a daemon by Parmenides. An element of uncertainty exists on this point since the doxographer Aetius seems uncertain if a passage names an actual daemon or if the daemon should be read as a poetic personification of the infernal powers. Aetius' confusion, however, should not weigh strongly against the point. That this is a journey to the underworld, after all, is damning enough.[24]

The revelation that Being is like a well-rounded sphere is central to Parmenides' story. What is most important is that this truth--and he calls it a truth distinct from the opinions of mortals--is vested with the authority of this daemonic being and does not stand alone as a reasoned conclusion.

If we accept that Parmenides was a globularist, *On Nature* provides us with the modus operandi of his Eureka over globularism. His belief in the sphericity of the Earth would likely have occurred in the context of this shamanic experience or other visions during his career. With a daemonic authority underwriting the truth of his ideas, empirical grounding would be pointless. Parmenides was too inwardly directed for us to speculate that he observed natural phenomena which led to globularism.

As a digression, I am prompted to wonder how profoundly embarrassed those of orthodox sentiments would be if some Whiggish scholar tried to put Parmenides in the role of a hero for scientific truth. Newton's works of alchemy seemed a bit of a shock for scholars revering the heros of the Copernican revolution. Imagine the distress trying to make a hero out of what our age would surely term a devil-worshipper. It can't be shaken-off as an irrelevant difference of religion. The well-rounded revelation given by the daemon goddess is integral to the argument that gives him priority. It would also be curious

Philolaus has also been credited with the belief that "we are one of the possessions of the gods," which seems a precursor to the famous statement by the critic of globularism Charles Fort:"We are property."

to know how a culture which reveres Christian metaphysics would handle globularism if it became widely known that belief in a spherical Earth was daemonically inspired.

The fragments of Philolaus are less damning than those of Parmenides, but are clearly steeped in mystical concerns. In them, a person can find talk about the One which is the beginning of everything, of Limit and Unlimit, of Nature and Harmony, the power of the Decad (Ten-ness), and the power of Number in divine and supernatural existences. Science probably owes Philolaus a debt in forwarding the sentiment,"In truth, everything that can be known has a Number; for it is impossible to grasp anything with the mind or to recognize it without it." A passion for the precision of thought which Number fosters underpins the exact sciences. That precision of thought, however, was not characteristic of Philolaus or his Pythagorean brothers. He believed something called the Decad was great, complete, and the origin of divine and human life. Philolaus also expressed an almost charmingly naive faith that "Falsehood can in no way breathe on Number." (As a digression, Philolaus has also been credited with the belief that "we are one of the possessions of the gods," which seems a precursor to the famous statement by the critic of globularism Charles Fort: "We are property.") Mostly, the fragments express vague arguments about the makeup of the universe. They aren't especially insightful or valid and there is nothing on a level of investigation like the mainstream Greek philosophers.[25]

Pythagoreans, as a group, were not in the forefront of nature philosophy. Through the centuries a mythology has developed around the Pythagoreans as the keepers of a superior intellectual tradition started by a man of world historical genius and brilliant mathematical achievements. This tradition, recently subjected to critical analysis by Walter Burkert, is now thoroughly demolished.[26]

Of Pythagoras himself, only two facts are incontestable. He was the founder of a religious society. He taught a doctrine of metempsychosis – in essence, a version of reincarnation. This is hardly an auspicious context in which to look for a possibly scientific base for globularism. It has been claimed that Pythagoras was an intellectual. Aristotle's testimony is usually cited in support, but Aristotle merely said Pythagoras fused mathematics to philosophy. The manner in which Pythagoras did this struck Aristotle as quite odd.[27]

The followers of Pythagoras did not behave as though the exploration of nature was a dominant concern. The secret initiation of disciples practiced by the Pythagoreans prompted the anthropologist Weston La Barre to remark on its similarity to shamanistic medicine societies, especially in its aspect of the fictive brotherhood. This had a political element quite opposed to the spirit of Athenian ideals and its urbane schooling style. Exceedingly interesting is the long, if incomplete, list of acusmata, or maxims, that has survived. They amount to a series of ritual taboos:

1. When going out to temple, worship first, and on your way neither say or do anything else connected with your daily life.

2. On a journey neither enter a temple nor worship at all, not even if you are passing the very doors.

3. Sacrifice and worship without shoes on.

4. Turn aside from highways and walk by footpaths.

6. Follow the gods and restrain your tongue above all else.

8. Stir not the fire with iron.

10. Help a man who is loading freight, but not one who is unloading.

11. Putting on your shoes, start with the right foot; washing your feet, with the left.

12. Speak not of Pythagorean matters without light.

13. Never step over a cross-bar.

14. When you go out from home look not back, for the Furies come after you.

18. Do not sit on a quart measure.

21. Do not let a swallow rest under your roof.

22. Do not wear a ring...

24. Do not look in a mirror beside a lamp.

25. Disbelieve nothing strange about the gods or about religious beliefs.

26. Do not be possessed by irrepressible mirth.

27. Do not cut your fingernails at a sacrifice.

29. When you rise from bed roll the bed-clothes together and smooth out the place where you lay.

30. Eat not the heart.

32. Spit upon the trimmings of your hair and fingernails...

34. Leave not the mark of the pot in the ashes.

37. Abstain from beans.

39. Abstain from living things.

Many of these commandments have undoubted connections to old magical beliefs, folk tradition, and alternate Greek religions. Scholars like Burkert, La Barre, and E. R. Dodds have pointed out the magickal quality of the beliefs underlying them. The significance of these acusmata is that they reveal a superstitious mindset not generally associated with the critical spirit of science. Of several figures critical of superstition among Greek thinkers, none were Pythagorean. The warning against criticizing strange teachings about the gods was apparently well followed. The acusma against irrepressible mirth is equally troubling in that it echoes the restrictive control of mind and behavior we find in religious groups now opprobriously termed cults. The impression is easy to reach that members would be perceived as humorless robots by outsiders. Cults are notorious for the cultivation of unorthodox beliefs and it is plausible that the insulation from reality-testing cults provide may explain why globularism arose among Pythagoreans rather than among mainstream philosophers.[28]

There are two major innovations in mathematics commonly credited to the Pythagoreans. Burkert found both attributions improper. Every high-schooler exposed to geometry necessarily recognizes one of these discoveries--the Pythagorean theorem. It states that the sum of the squares of the two legs of a right triangle is equal to the square of the hypotenuse. It is a fundamental theorem of geometry and the field would be unrecognizable without it. What few geometry students realize is that the Pythagorean theorem did not originate with either Pythagoras or his followers. It was used by Babylonians and has been found in little school textbooks dated more than seventeen centuries before Euclid immortalized it in his revered text on geometry.[29]

The discovery of irrational numbers is the other innovation attributed to the Pythagoreans. The realization that the square root of two had to be both odd and even was said to have created a crisis of faith among them. The story apparently predates Proclus and has been perpetually tied into a rather doubtful story which involved secrecy, betrayal, and an ensuing divine punishment. It seems likely it was a complete fiction designed for the thrill of it, rather than an account of a historical fact. It has been noted that such a discovery does not seem to fit in with interests in number theory, a specialty of the

Pythagoreans. It would more likely arise from studies in geometry. The claim that Pythagoreans provided the foundations of Greek geometry has no evidence to build on.[30]

The Pythagorean interest in number has been characterized by Weston La Barre as fundamentally magico-shamanistic. Its beliefs were mystical and had a quality reminiscent of synaesthesia. Each number had its own personality–masculine or feminine, perfect or incomplete, beautiful or ugly. Their belief in the power of the number ten as embodied in the Decad underscores their interest as being for the purposes of magick and not a simple investigation into the nature of numbers.[31]

Turning to the more relevant area of Pythagorean astronomical beliefs, there is nothing there to indicate an empirical cast of mind. One of their more puzzling beliefs concerns the existence of a counter-Earth. Aristotle, in a wily dig at Pythagorean number mysticism, joked it existed solely to bring the number of planets up to the sacred number of ten. I lean to Burkert's view that it conceivably arose as a function of the shamanistic views of Pythagoras and his followers. Counter-Earths, worlds opposite of what we know, are common in folklore. The realm of the dead is sometimes represented by such a device. Pythagorean acusma which identify the Sun and the Moon with the Isles of the Blest presuppose just such a world-view. Other speculations are associated with the Central Fire Pythagoreans set at the center of the universe. Dicks suggests the counter-Earth provided a reason, however specious, for our not seeing this Central Fire. George Burch suggests the counter-Earth balanced the mechanical equilibrium of the cosmos across the center of the cosmos. Whatever the correct explanation, Dicks is clearly correct that the whole scheme is "a good example of the type of presumptive theorizing that characterizes much of the astronomical thinking of the Pre-Socratics." It "bears little relation to the facts of actual observation."[32]

The music of the spheres may have been a venerable notion to thinkers of later ages, but its origin in Pythagorean thought turns out to have been quite ignoble. It arose from a curious opinion that the celestial bodies whirling at great speeds around the cosmos must generate noise through their motion. Each body would produce its own tone according to its distance from the center. Together they formed a

harmony. The awkward fact that no one hears this music is ingeniously rationalized away by averring it forms a constant background from birth and so cannot be realized without absolute silence in contrast to it. La Barre notes that music possibly originated among shamans and was often their exclusive province within a given culture. Thus this belief underscores again the likelihood Pythagorean astronomical beliefs originated in a shamanic and cosmic magic millieu. Dicks felt the music of the spheres demonstrated "once more how prone the Pythagoreans were to subordinate the facts of natural phenomena to their philosophical and mystical predilections."[33]

Some have have credited Pythagoras with more substantial discoveries about music. They believed he was the first to apply arithmetic to basic harmonic ratios. They also believed he first discovered that sound is derived from the movements of air. It turns out these ideas were already in the air, as it were. Those observations and laws believed to be truly Pythagorean by critical scholars are known simply to be impossible. As the Pythagorean use of music was concerned with magick, accuracy was not the prerequisite condition to what they accepted as truth.[34]

On every point about which the Pythagoreans can be judged, the balance of the evidence consistently points in the direction of irrational thought. The style of thinking in mystical terms permeates everything they believed. Given this habit, it would be absurd to believe that in developing the idea of the spherical Earth they suddenly acquired a scientific mentality and made recourse to careful observation and insight.

If the reader needs some reassurance that this judgement is not just an idiosyncratic attack by the author, let me point out that I am not alone in the general conclusion that globularism was founded on an irrational process. The venerable historian of Greek astronomy Sir Thomas Heath believed the likely origin of the sphericity belief lay in cosmic symmetry and the mathematical aesthetics of the Pythagoreans. Charles H. Kahn, a specialist in Greek cosmological belief, concurs with Heath and defends the irrationality thesis at some length. Rene Taton, a historian of science, has expressed a belief that the sphericity of the Earth was postulated for "purely aesthetic reasons." Other historians of science, Stephen Mason, Olaf Pedersen, and Phil

Megens felt that the Pythagorean belief in the perfection of the sphere was dominant in shaping their conceptions of the figures of the universe and the Earth.

George Sarton, probably the most respected giant of science historians, has advanced a curious variation of the irrational origin thesis. He posits that the Flat Earth was rejected on unknown grounds and to fill the void of cosmography "the sphericity of the Earth was postulated rather wildly, on insufficient experimental grounds. The Earth cannot be flat, therefore it ought to be spherical. Was not the starry heaven visibly part of a sphere? Was not the disks of the Sun and Moon circular? And was any volume or surface comparable in symmetry and beauty to those of the sphere? This fundamental Pythagorean idea was an act of faith rather than a scientific conclusion. Does not every scientific hypothesis start that way?"

With due respect for Sarton, very few scientific hypotheses do start *this* way. I doubt especially that a disproof of flatness was offered at any time. Prior ideas tend to hang around even when a better one exists. Sarton goes on to assert that once globularism was established as a dogma, the theory of eclipses followed and served to reinforce the initial assumption of sphericity. This is an important point in that it asserts a developmental sequence ignored by scholars like Sambursky and Giorgio de Santillana when they give symmetry and lunar eclipses equal responsibility in the creation of globularism.[35]

That lunar eclipse theory appears about the same time as lobularism can be deemed strongly suggestive evidence that one prompted the other. But it is not a simple as it seems. Lunar eclipses y themselves do not lead to the idea of globularism. The history of Chinese astronomy proved this. Around 120 A.D. Chang Hêng, indeendent of Western influences, came to the same conclusion as naxagoras that lunar eclipses result from the obstruction of sunlight y the body of the Earth. The idea of a spherical Earth not only did ot immediately follow this advance, nobody in the subsequent fifteen enturies advanced the notion of a spherical Earth. It had to be imorted from the Western intellectual tradition.[36]

Why did globularism and eclipse theory appear concurrently? ecause they both developed from Anaximander's innovation of an arth suspended in the void. Anaximander suspended his Earth by

virtue of similarity acting from rings of stars surrounding the disk of the Earth. It was not a hard leap of imagination to see that a spherical shell of stars would do as well or better in holding the Earth in the center. That was Parmenides contribution. From there it was a simple step to have the principle of similarity shape the Earth into a sphere. Meanwhile, somebody else realized that with the Earth suspended in the void the Sun was able to travel not only over the Earth, but under it. It took Anaxagoras to realize that with the Sun traveling under the Earth, it would cast a shadow upwards into the cosmos and that the Moon might pass through it occasionally. Understood in the light of a developmental history, it can be seen why the two ideas appeared together and yet were not directly related.

Sambursky and de Santillana seem to be the only scholars to show an awareness of the irrationality thesis and show any reservations in accepting that conclusion. Those historians who have thought globularism was derived from natural phenomena seem not to be aware of the irrationality thesis. None have ever advanced a single criticism of the idea that globularism was an irrational concept. There has, to date, been no controversy among scholars knowledgeable of the history of Greek astronomy. It is benignly accepted as a reasonable inference.

It is the best deduction plausible in the context of all the historical facts. It makes sense why globularism only occurred once, why it occurred among the ancient Greeks, and why everybody responded as they did before and after it was put forward. It occurred only once because natural phenomena did not necessitate the creation of a spherical Earth theory. It occurred centuries before a proper science would have realized anything was wrong with the flat Earth theory.

It occurred because of a sequence of errors in the cosmographical reasoning of Greek philosophers. The first error was accepting the postulate of similarity or symmetry between the form of the Earth and the sky. Basically this was a mythological concept derived from the Babylonians and Egyptians. The second error was Anaximander's speculation that the Earth floated on air as against floating in the water, as prior thinkers had it. The third and last error was Parmenides' concept of a spherical universe. Only the freakish coming together of these ideas would yield a theory of the spherical Earth in

ancient Greece. It is hardly surprising no one else repeated these mistakes. It also hardly is surprising that Pythagoreans would make this mistake and not Democritus.

You can see, now, that I wasn't kidding when I said there was a nasty little secret to the birth of globularism. It is bad enough that its parentage involved either a devil-worshipper or a math-crazed cult zombie. The perfectly naughty fact of the matter is that the idea of the spherical Earth was, in the unkindest sense of the phrase, a crazy, crazy, crazy idea.

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INCENDIARY POLTERGEISTS, SPONTANEOUS HUMAN COMBUSTION and FIRE SUICIDE CLUSTERS

By Loren Coleman

A Personal Note

As I was growing up, I had the rare opportunity to be surrounded by the culture of fire. For 20 years, through the formative days of my early intellectual development and later adolescent turmoil, my father was employed as a professional firefighter for a medium-sized city in the Midwest USA. He would bring conflagrationary stories home, talk about carrying cindered bodies out of burnt buildings and cry over fallen comrades on the job. Although he was not a classic firechaser–his dysfunctions existed in other areas–the family often found itself, when he was off-duty, standing in front of sinister burning scenes, transfixed by the beauty and danger of the fire before us. Besides generally wondering why in the hell we were there, sometimes I would question the source of the fact that these fires did, indeed, seem to exert a sort of power over people. Even back then, I found myself trying to make sense of the whys and whens of fires. I continue to wonder about fires, especially the mysterious ones.

Fort and Fires

At eleven I devoured all the words I could discover by Charles Fort and recalled being struck by his discussions of fires. He probably put it most concisely in the following covert preface to his examination of weird fires, as found in *Wild Talents*: "Because of several cases that I

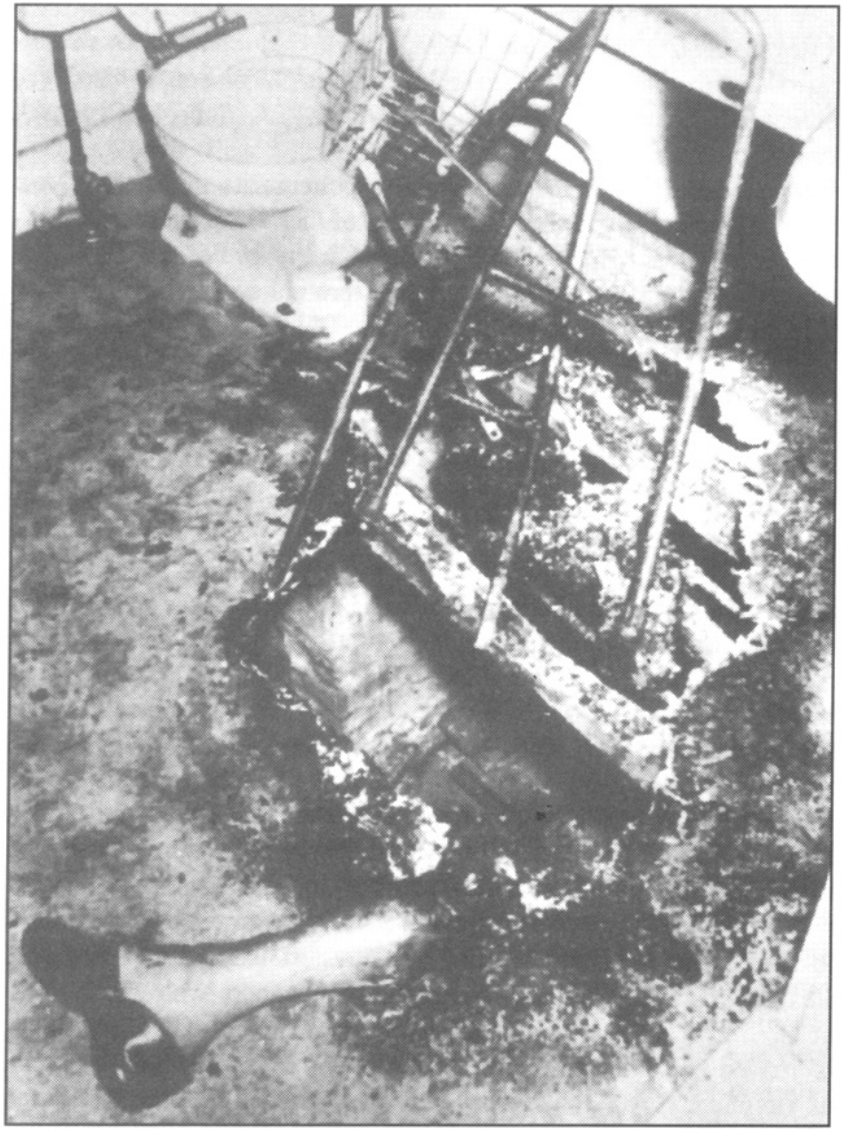
have noted, the subject of *Fires* attracted my attention. One reads hundreds of accounts of fires, and many of them are mysterious, but one's ruling thought is that the unexplained would be renderable in terms of accidents, carelessness, or arson, if one knew all the circumstances. But keep this subject in mind, and, as in every other field of phenomena, one comes upon cases that are irreconcilables"

Fort then ventures forth into the topic of fires associated with poltergeist activity. Case after case is given of multiple fires starting in a house or a series of fires following a family from dwelling to dwelling as they attempt to escape the wrath of the unseen firestarter. The parapsychologist Nandor Fodor called them "incendiary poltergeists." In his chapter appropriately entitled "The Rage that Burns the House Down," Fodor used incendiary poltergeists to illustrate his underlying theory for the cause of all poltergeist activity, namely:"The chief motive behind Poltergeist disturbances is repressed aggression in the psyche of adolescents before puberty." He's talking about "psychokinesis" (PK), of course, which means "to move by the mind."

The Poltergeist Girls

The stories Fort gathered from the end of the last century and the beginning of this one certainly supported Fodor's thoughts in this direction. Fort's incendiary poltergeists accounts are populated by families containing adopted daughters, housemaids, servant girls and teenagers. Fort called these young women collectively, the "poltergeist girls." The work of Vincent Gaddis and the late D. Scott Rogo on poltergeists, likewise, contain sets of cases filled with mostly latency-aged and adolescent females. Rogo's excellent discussion of these fiery geists in the first half of his chapter "Bizarre Poltergeists" looks at both Gaddis' and Fodor's notions of PK-induced electrical charges corning from young people on-site. Rogo notes that such PK-sparks cannot explain why normally noncombustible objects are also consumed by the incendiary poltergeists. Nevertheless, all of these authors agree to the abnormality of incendiary poltergeist incidents.

Fire insurance, it should be noted, was a direct result of incendiary poltergeist activity. During the turn of the century, in that debunking, rational thinking world, the rash of incendiary poltergeists



The charred remains of 92-year-old Dr. John Irving Bentley of Coudersport, PA, found on December 5, 1966. Note unmelted rubber tip on walker. Photo copyright 1976 by Larry Arnold.

cases were more often than not placed at the hands of the young women who happened to be nearby. Human arson and mischievous firesetting were to blame, we are told. But in a personal discovery unrecorded to date in the anomalist literature, I found through a search of non-Fortean fire investigation history direct links between a series of what I would have to say were fire poltergeists in wealthy New York City homes, the attempted blaming of these fires on mostly German housemaidens, and the development in the United States of fire insurance. The insurance underwriters were called in when the fires could almost be classified as an epidemic and the domestic help explanations were found to be full of holes. The implications of such a history are worth pondering for a moment.

Spontaneous Human Combustion

Fort thought deeply about the whole subject of the fire poltergeists and for several pages in *Wild Talents* moved the reader to several scratches of the head. Then, not very abruptly, Fort dovetails his chapter into his cases of spontaneous human combustion (SHC). You know the images by now: a young woman's body bursting into blue flame on a dance floor, elderly individuals catching fire in overstuffed chairs, a man's arm shooting forth a lapping demon of death. The step from incendiary poltergeists to SHC is not a big one. There even seem to be cases that bridge the two.

Take for example the strange plight of Angela Hernandez, 26, of Los Angeles. On 28 May 1990, she was struck by a car and brought into UCLA Medical Center. Then, as surgeons finished operating on her and were about to take her out of the room on a gurney, the sheets and blankets covering her mysteriously caught fire and filled the hospital room with smoke. Staff members who tried to put out the fire were forced out of the room by the smoke. When firefighters arrived five minutes later, the blaze had mostly burned itself out, but Hernandez was already dead. Battalion Chief Chuck Merriman said,"The fire wasn't even hot enough to set off the sprinklers in the ceiling." In many ways, the incident mirrors the intense localized fires recorded for SHC and incendiary poltergeist cases.

Spontaneous human combustion, while little understood,

seems to be experiencing a renewed level of examination, both sympathic and critical. Recently, during the 1990s, even such organizations as the National Fire Protection Association has officially inquired into how best to include material on SHC in their national fire and arson investigators training manual.

Fire Suicide Clusters

Some answers to SHC's mechanics may lie in a reexamination of incendiary poltergeist cases and, yes, even in the field of suicidology. The parapsychological theory that SHC could be the internalization of destructive psychokinetic impulses is not too distant from the framing of suicides as "aggression turned inward," a leading catch phrase in forensic suicidology. Vincent Gaddis' chapter on SHC uses the word "suicide" to demonstrate his bias in favor of this stance. And many SHC researchers are stumped by some fire suicides that clearly appear to be SHC. As long ago as 1982, SHC investigator Larry Arnold and I shared notes on individual reports of fire deaths that were first said to be SHC, then changed to an official finding of "suicide" to quickly quiet the uproar surrounding such cases.

What is truly amazing is that fire suicide clusters, in general, are not fully understood. Waves of self-immolations, as they are often called in the media, tend to come in certain patterns that have never really been dealt with in the scholarly journals. In many ways. fire suicide clusters are global indicators of political unrest that usually predict a minor or major governmental shift of some sort. It is almost as if the energy we note being exhibited in the incendiary poltergeist or the SHC event is projected on a grand scale.

Fire Precursors

The most vivid recent precursor examples relate to the overthrow of the communist regimes. On April 26, 1990, a Lithuanian man of 52, Stanislovas Jamaitis, threw gasoline on his clothes and set himself on fire in front of Moscow's Bolshoi Theater. He died a short time later. According to his suicide note, he was protesting the Soviet reaction to Lithuania's declaration of freedom."I went to Moscow to set myself on fire," he wrote in a note addressed to faimily and authorities.

Stanislovas Jamaitis' suicide was taken seriously by official

Lithuanian sources, and slightly less so by Tass, the Soviet news agency. Tass did not mention any of the potitical motives contained in the suicide note and, instead, reported that Jamaitis had talked of "an impossible family life and a desire to commit suicide." The Lithuanian Supreme Council did release the note's contents. In that version, Jamaitis apologized for "something bad" in his marriage, but identified his strong political reasons for setting fire to himself.

"The occupiers have cut off energy supplies and people are being thrown out of work," noted Jamaitis, who had himself been recently laid off."I have lived my whole life in occupied Lithuania," he continued. Then he specifically commented that he was killing himself to "let Gorbachev know that Lithuanians will not live in a Lithuania that is not independent."

Then, on May 11, 1990, a Lithuanian identified as Rimantas Daugintis, a resident of Vilnius, doused his body with alcohol and set himself on fire at a border crossing near Zahoney between the Soviet Union and Hungary. Suffering serious injuries, he was placed in a hospital with burns over 80 percent of his body. On May 27, 1990, a Romanian, Miroi Dimitru, 31, set himself on fire in front of the US Embassy in Budapest, Hungary.

Meanwhile in America, the Gulf War stirred up fire suicides. On February 18th, 1991, Gregory Levey, the stepson of *Boston Globe* columnist Ellen Goodman, set himself on fire in Amherst, Massachusetts. Three days later in Springfield, Massachusetts, Raymond Moules, did the same thing. Were there more we did not hear about? Probably as with incendiary poltergeist, SHC and self-immolation incidents, the stories are only carried in local papers. Like small regional flaps of UFO sightings, fire phenomena are difficult to track nationally or globally. But we try. Often we end up with more questions than answers.

These fiery suicides seem unrelated, perhaps, to Fortean phenomena, but I propose we dismiss the connection too quickly. Are we dealing with a process we do not yet understand? Can we say these rare events are merely a Lithuanian reaction to Russian political and economic pressure or a college town protest of Bush's war against Iraq? Something deeper appears to be happening.

Certainly, if the past is any key, these recent incidents are precursors on a macrolevel of human-fire interactions For example, on May 14, 1972, a Lithuanian student and Roman Catholic, Roman Talanta (also noted as Romas Kalanta), 20, poured nearly a gallon of gasoline over his body and set himself on fire in the western Lithuanian city of Kaunas. During his funeral, several thousand youths battled Soviet policeman and soliders, ending in fatalities among the Soviets. Talanta's suicide was a symbol of Lithuanian resistance throughout the 1970s and 1980s.

Self-Immolations: The Vietnam Model

Historically, suicides by fire–also called self-incinerations or self-immolations–have often led to widespread copying and clustering. But no one knows why. Use of this specific method of suicide, especially tied to political and religions reasonings, lends itself to graphic expressions of frustration. These events are then often communicated far from the site of the fire suicides by word of mouth, newspapers, and today, via the electroinic media. While the modern era has had some notable examples of fiery suicide clusters, examples of these types of protests have been around a long time. My book Suicide Clusters overviews this history in some detail. Suicide clusters of the fiery type existed long before CNN, of course, hit the airwaves.

As a case example, it is insightful to look at the beginning of the era of modern deaths by fire. During the early days of 1963, the ongoing Indochinese war was made more complex by the dictatorial policies of the Ngo Dinh Diem regime of South Vietnam. This American-backed government was led by the members of the Diem family, all Roman Catholics, who, the country's Buddhists felt, were extremely repressive. At Hue, South Vietnam, on May 8, during a demonstration against the Diem policies, government troops fired on the crowd, killing nine Buddhists. In a country that was 70 percent Buddhist, the resulting protests were frequent and widespread. On June 11, 1963, the protests would take a new form which would influence political suicides for decades to come.

On that date, the Buddhist monk Thich Quang Duc doused his yellow robes with gasoline in the public square of Saigon, and set

himself on fire. Thousands watched and Buddhist nuns and monks carried banners demanding religious freedom and social justice. The media had been forewarned that a demonstration was to take place, but they had not known that a monk would burn himself alive. The next day, photographs and films of the event were published and broadcast worldwide. Thich Quang Duc's dramatic declaration of dissent was headlined around the world.

During the summer of 1963, others in Vietnam choose to kill themselves in protest of the Diem regime. On July 7, Vietnam's most famous writer, Nguyen Tuong Tam, a Buddhist, killed himself in prison by taking poison. Thich Quang Duc's specific act was viewed as the more dramatic, and soon imitated by others. On August 4, a second Buddhist monk, Le, in his twenties, burned himself to death in the center of the seacoast town of Phan Thiet. Government troops removed his charred body before his fellow monks could reach it.

The self-immolations spread quickly. On August 13, a 17-year-old novice monk burned himself to death. Two days later, a Buddhist nun, Dieti Quang, set herself on fire in the seacoast town of Ninh Hoa, and died shortly thereafter. The next day, a 71-year-old monk took his own life by burning in Hue's biggest pagoda. Three Buddhists had died by fire in one week. Government troops declared martial law in Hue, and were searching for ways to stop the suicides. But the political repression caused a renewed sense of outrage on the part of the Buddhists, and protests abounded. By the end of the year, at least four other monks had burned themselves to death.

We must pause to reflect that the self-immolations were key indicators of a deep psychic wound in America and Vietnam. By the end of 1963, both presidents of these two countries (Diem and Kennedy) would be dead by assassination. In the two years that followed, nine more political protest self-immolations occurred; these included five Buddhist monks in South Vietnam, one politican in Korea, and three Americans.

In America

The American self-immolations began on March 17, 1965, with Alice Herz, an 82-year-old Quaker and librarian. While on a street corner in

Detroit, she poured cleaning fluid over herself and set it afire. As she was rushed to the hospital, covered with second and third-degree burns, she told a firefighter:"I did it to protest the arms race all over the world. I wanted to burn myself like the monks in Vietnam did." In her purse, police found a note stating Herz was protesting "the use of his high office by our President, L.B.J., in trying to wipe out small nations...I wanted to call attention to this problem by choosing the illuminating death of a Buddhist."

On November 2, 1965, Norman Morrison, 32, also a Quaker, burned himself to death in front of the Pentagon in Washington, D.C. because of the Vietnam conflict Eight days later, 22-year-old Catholic Worker Movement member Roger Allen LaPorte calmly went to the wide avenue in front of the United Nations, doused himself from a gallon can of gasoline, stepped off the curb, and sat crosslegged in the fashion of Buddhist monks. He struck a match, and was engulfed in flames. As he was rushed away, between asking for water repeatedly, LaPorte told the ambulance attendents:"I'm a Catholic Worker. I'm against war, all wars. I did this as a religious action." One of LaPorte's ambitions had always been to be a Trappist monk, and beginning in 1963, he had attended the St. John Vianney Seminary in Barre, Vermont, for a year. As LaPorte lay dying on a hospital operating table, he was visited by two psychiatrists who asked him if he wanted to live. Unable to speak now because of a tube down his throat, he nodded affirmatively. But he died the next day.

The highly visible protest suicides of Herz, Morrison and LaPorte appear to have influenced the method of suicides for other Americans not so politically motivated during this same time period. For example, the day that LaPorte died, a South Bend, Indiana, woman attempted to commit suicide by fire. Despondent over the October death of her three-month-old baby, and the casualty reports from Vietnam, Celene Jankowski, 24, set herself ablaze in front of her home. A police spokesperson noted that one of Jankowski's brothers had been killed in the Korean War, and that she had been deeply disturbed by the Vietnam situation, although she was not a member of any formal protest organization.

The wave of political self-immolations continued in 1966 and

1967. Thirteen Buddhists in Vietnam, one Soviet citizen, and one American student received widespread publicity during 1966 for their acts. In 1967, five Buddhists in Southeast Asia and five Americans in the U.S. died in fiery political protests. Three other Americans died by self-immolation in 1966 and 1967, but apparently not for political reasons. Still the contagion effect may be important in terms of these suicides.

Indeed, throughout the early 1970s, self-immolations related to the Vietnam War took place in Southeast Asia and America. For example, Times Square was the scene of a dramatic self-immolation at 2 P.M. on Saturday, July 18, 1970, when Hin Chi Yeung poured two cans of gasoline on himself and struck a match. On August 24, 1971, a 37-year-old Vietnam veteran and father of six, Nguyen Minh Dang, set himself afire in Saigon's central market, praying for another veteran who burned himself to death on August 16 in a peace protest. A 58-year-old laborer at Vietnam's Tan Son Nhut Air Base burned himself to death "for the cause of national peace" on Septermber 6, 1974.

The Global Incendiary Poltergeist

The dramatic and news-capturing death of the Buddhist monk, Thich Quang Duc, forever changed the face of political protest. As researchers Kevin Crosby, Joong-Oh Rhee and J. Holland noted in analyzing suicides by fire for the years 1790 to 1972, 71 percent of the reported self-immolations occurred in that last ten year period. The rise and actual clustering of this form of suicide only began after the death of Thich Quang Duc in 1963. These researchers attempted "to explain the clusters of protest self-immolations in South Vietnam" by pointing to the "high level of tension among the opposing factions" and the "intense emotional atmosphere" it produced. They felt similar clusters are likely to recur when times are "unsettled, emotions inflamed and when no appropriate outlet exists for the expression of commonly shared emotions." Is this the global incendiary poltergeist at work?

A Future Worth Watching

The notion of political protest by self-immolation was not as important during the late 1970s and 1980s, as it was in the 1960s and early 1970s. But what of the 1990s? Was the fatal firestorm at the Branch Davidian compound in Waco, Texas, where almost 100 men, women and children died, a mass fire suicide? There has certainly an increase in individual fire suicides in Kenya, Korea, India and the United States. Will we also see an increase in incendiary poltergeist cases and SHC? D. Scott Rogo noted that fire poltergeists picked up in frequency at the end of the last century. Can we expect the same as this century and millennium draw to a close?

Whatever the case, we should not let our guard down around fire phemonena. There is much to wonder about in the flames.

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The Perils of Erasing Astrology From the Past

by Ingo Swann

Astrology is perhaps the most detested topic of the modern scientific age. Nevertheless, it is generally agreed that various kinds of astrology played significant social roles in most past civilizations and their cultures. There is no historical argument at all regarding the fact that the roots of modern astrology are found in very ancient Egypt, India, China, and Arabia, and among the ancient Mediterranean civilizations of Babylon, Macedonia, Greece, Italy, Palestine, and so forth. It is also generally agreed that few ancient rulers took many steps without consulting astrologers, although they are considered silly by moderns for having done so. It is also known that in most of those very ancient and less ancient societies, astrology was considered a state function largely held in the hands of state-supported priesthoods.

The social, political, and religious influence of astrology can be traced forward in time, through the Middle Ages and the Renaissance, and into early modern times. For example, in *Prophecy and Power: Astrology in Early Modern England*, the scholar Patrick Curry traces the fortunes and misfortunes of astrology in early modern England from about 1642 to about 1835. This scholarly text clearly establishes that astrology was at least an often vital influence among the nobility and intellectuals responsible for shaping cultural-governmental policies.

This "vital influence" dates backward in time into dynastic Egypt, India, China, and Arabia – presumably having even earlier prehistoric roots. In the case of Egypt, for example, elements of astrological practice are evident in the early dynastic period, approximately

3000 B.C. In this sense, then, astrology has at least a 5000-year *known* history of strategic influence which endured, in various forms and intensity, until about 1830 A.D. Of all social and cultural phenomena, then, astrology in some form has been consistently and sometimes prominently present throughout human history.

The historical presence of astrology is seldom argued. What is argued, though, is whether historical and archeological attention should be paid to it. Both history and archeology, as we take them in their modern sense, are scientific processes–or, in any event, are not ascientific ones. As such, the two disciplines, whose goals are to reveal the past, however near or distant, are subject not only to scientific methodologies, but to scientific overviews and the "realities," concepts, preconceptions upon which those overviews are constructed.

It is abundantly clear that modern science rejected astrology, and, in fact, many scientists evinced pride in so doing. The ostensible cultural reasons for the rejection are a complex tale-in-itself, but the general scientific justification held that the planets were too far away from Earth to have any virtual effect upon its geological, biological or human psychological phenomena. In this sense, then, astrology was ascientific and not deemed either a credible or an appropriate topic for scientific study or analysis. It was stigmatized as such not only scientifically but socially as well.

Thus, when historians and archeolologists attached their disciplines to science proper, the astrological stigmatization had to be observed, or at least danced around, in order to maintain scientific credibility and acceptance. The result is that the term "astrology" does at all figure in scientific, historical, or archeological frames of reference, or if so, then only in a pejorative sense.

The fall-out from this modern anti-astrological situation is that, in large measure, no scientist, historian, or archeologist has studied astrology, its mechanics, or its various stages of past historical and archeological development. In fact, the presence in history and in past cultures of astrology is bowdlerized from modern historical and archeological perspectives and applied anachronistically into the past.

Since many past cultures indeed contained significant astrological socializing cores, it is questionable whether contemporary

It has to be taken for granted that modern historians and archeologists who know nothing of astrology probably are not capable of recognizing the astrological elements in the past cultures they select for study.

historians or archeologists working to reconstruct the past as accurately as possible can really do so by bowdlerizing astrology from it. "Bleeping" astrology out of history and archeology serves no valid purpose in either discipline whose mutual interacting goals are to study the past as completely as possible.

And it has to be taken for granted that modern historians and archeologists who know nothing of astrology probably are not capable of even recognizing the astrological elements in the past cultures they select for study. Such historians and archeologists need not themselves believe in astrology; but many of the past societies they select for study did carry various astrological beliefs within them. And how these latter are to be correctly interpreted or identified by the former, if the former possess no astrological database, is a matter of some humorous interest.

Astrology and Astronomy

One significant and telling clue exists regarding the utter importance of astrology to the past. Furthermore, it is one upon which all scientists, historians, archeologists, and astrologers agree. Pror to the middle modern age (beginning circa 1845), nothing in previous human history indicates that any division existed between astronomy and what we call astrology. It is fair to say, though, that the astrological portion of astronomy had its philosophical detractors in antiquity. But a clinical inspection of the "complaints" of these detractors shows that they inveighed more against the fraudulent-divinatory use of astronomy than astronomy/astrology per se.

The beginning of the formal cultural-scientific separation of astrology from astronomy is difficult to date, but it probably began during the Renaissance when Count Pico de Mirandola (1463-94) argued pervasively against the former and an anti-astrological cult

formed as a result. The completed separation occurred sometime after the death of Sir Isaac Newton (1642-1727), one of the greatest scientist-astronomers of his age, and an "astrologer." As the scholar Patrick Curry shows, astrology-cum-astronomy remained a vital intellectual force in early modern England until after about 1830.

The term astrology itself is of rather recent vintage when compared to the whole of "astrological" history. A number of linguistic contributions are involved that makes the origin of the term difficult to identify and there is no easy way to sort out the difficulties. But the complexities are eased somewhat if we bear in mind that what we call "astronomy" and "astrology" were considered one and the same thing up until at least the late Renaissance, when a few individuals began to define between the study of the planets and stars per se (astronomy) and the study of their effects on Earth (astrology).

Linguistic evidence shows that, although the Romans considered astronomy and astrology as synonymous, they did discriminate between *astronomia*, which took on a scientific sense, and *astrologia*, which took on a "star-divinatory" sense. But this division in no way carried the same cultural impact as our present use of the two terms does. The acquisition into English of "astronomy" derives from the Old European *astronomia*, an obvious carry-over from the Latin. *Astrologia* was subsequently reintroduced (it is thought) as referring to the practical application of *astronomia* to mundane affairs and thus gradually limited during the eighteenth century to reputed influences of the stars unknown to science. It is worth noting that Shakespeare (1546-1616), the arch-innovator of the English language and neologisms, did not utilize the term "astrology," and so it can definitely be stated that it was not in popular, intellectual, or even in cult use until sometime after his death.

The modern definitions of astrology and astronomy have separated the two in dramatic definitional ways. But the retrospective application of the modernist definitional differences backward into antiquity and prehistory is clearly an anachronistic exercise that mollifies contemporary anti-astrological sentiments–but which distorts our view of social configurations of past cultures. Many aspects of oral raditions, written remains and records, artifacts, and many ancient

and prehistoric monuments cannot more completely be understood by sanitizing them of their astrological connotations. Why this is so now needs to be clearly established.

In his remarkable book, *The Case FOR Astrology*, the astrological archeologist John Anthony West, at length discussed two matters extremely important for historians and archeologists. He shows that all of the scientific objections to astrology have been refuted or answered not by astrologers, but by analogous work of scientists, cycles analysts, and other kinds of research. These refutations and answers, it should be noted, go unacknowledged behind the scientistic anti-astrological sentiments that still prevail.

In any case, West clearly establishes the two fundamental premises of "astrology," and shows that these can be found complete in pre-dynastic Egypt and that this extremely early completeness suggests an even earlier origin of the two premises. All of astrology--prehistorical, historical, or contemporary--is based upon a simple two-part premise: 1. That correlations exist between celestial and terrestrial events; and 2. That correspondences exist between the position of the planets at birth and the human personality. To these two premises a third must be added: 3. That the correlations and correspondences manifest on a spectrum ranging from benefic to malefic, constructive to destructive, angelic to demonic, or, as often expressed in contemporary astrology, from negative to positive.

Now, it must be stated that belief in either the reality or correctness of these premises is not necessary to understanding how earlier cultures regarded them, or why they regarded them at all. As a famous Mayan archeologist recently noted, the Mayans did not design their societies for our approval or even with our understanding in mind, but rather within the scope of their own realities, whether these are silly, disgusting, laudatory, or alien to us.

The first premise given above also probably at least approximates what may have been meant in antiquity by astronomy (or celestial watching)–although no definition of astronomy has come down to us from antiquity or prehistory. But the assumption that the ancients watched the celestial sphere and its activities as a "pure science" of and in itself is completely without any ascertainable

foundation, and thus without historical or archeological merit save an anachronistic one. In fact, many celestial activities on-going and repeating in a variety of cyclic sequences do have correlations with terrestrial events, and so the earliest vestiges of celestial-sphere-watching most obviously had to do with practical matters–especially those of a forecasting type.

There is no functional definitional difference between "forecasting" and "divining," except possibly the methods used to arrive at either. Indeed, the calendar in daily use is not just a day-keeping mechanism, but a forecasting or divining tool that shows us when certain important Earth-cum-celestial events will occur–such as the two equinoxes and solstices that correlate with spring, summer, autumn, and winter, etc. Today, we hold that these correlations are merely astronomical in nature; but the imputing of meaning, for example, to the vernal equinox, which always corresponds to 0 degree of the zodiac sign of Aries, is astrology pure and simple, in that we say that the vernal equinox means the end of winter and the onset of spring.

Whether or not additional celestial phenomena correlate with terrestrial events (geophysical, biological, or human-psychological) is merely a matter of accumulating enough statistical and qualitative data about them in order to decide either way. The data, however, must be accumulated before the decision is taken. The only real basic difference between today's astronomers and astrologers is that the former do not accumulate data about celestial-terrestrial correlations, while the latter do -- and have done since before 3000 B.C.

A novel way of thinking about the astronomer-astrologers of antiquity is that they were on a par with today's vividly scientific discipline comprised of cycles analysts. Cycles researchers, to their surprise, can now statistically show that a very large number of terrestrial phenomena are timed in keeping with (hence correlate with) certain celestial events–especially cycles of growth and decline, upheaval and calm, war and peace, and long arid and wet climatic shifts. Cycles researchers, then, are capable of imputing meaning-correlations to celestial phenomena–and thus have become "astrologers" whether they like the appellation or not.

There is absolutely no reason at all to believe that the ancients were any less interested than contemporary people in the practical celestial-terrestrial matters reflected in our average desk-top calendar. It is we who have to recover a broader range of celestial-terrestrial meaning-correlations via cycles and astrological research, largely and only because modern astronomers turned their attention to outer space per se, and avoided interacting with correlative celestial-terrestrial events. These are the territory of astrology, whether it is called astrology or not.

When we regard our desk-top calendars, we see them as twelve pages reflecting days, weeks, months, and the 365-day year. But behind this use of it, the calendar is based on the two equinoxes and solstices which divide the year into four equal 90 degree arcs of the zodiac. These four arcs refer to seasons, which are as important today as six millenia ago. And so it is the zodiac that we must examine, which is the centerpiece of all our calendrical aspirations and of astrology itself.

The Zodiac

Although most dictionaries attribute the origin of the term "zodiac" to the late Greek *zodion or zodiakos,* difficulties are apparent in trying to establish the phonetic language to which it must have belonged. Phonetically speaking, the origin of the term can only minimally be considered as having been Greek. In fact, since zodiacal representations are found preceding the rise of ancient Greek civilization in very early Egypt, as well as very early Babylon, Persia, India, China, and in prehistoric Ireland, England, France, and America, there is then no reason at all to assume that either the astrological concept represented or the term itself is exclusively of Greek origin.

But there is a further mystery, and a very profound one. Wherever zodiac iconography is found, no matter what age or culture is involved, it always means the same thing, and this beyond any question. the iconography refers precisely to 6 to 9 degrees on either side (above or below) of the ecliptic through which the "wandering stars" (the planets, including the Sun and Moon) wobbled their way along

the celestial sphere in repeating circular cycles. In contemporary terms, the zodiac might be called the planetary highway, or beltway.

Over time, all zodiac iconography consisted of from six to twelve representative figures (gods) portrayed against certain constellations, but is otherwise always portrayed as circular and divided into at least four, or ten, but usually twelve sections. In most, but not all, cultures, it is further subdivided into 360 degrees. The starting point of the circular zodiac is always the spring equinox in the northern hemisphere which, from some lost date in antiquity, has always been referred to as 0 degrees Aries.

Here, the first principal confusion about astrology is encountered. The astrologically uninitiated tend to understand that the zodiac is comprised of the famous twelve constellation arcs whose names are incorporated into it. This is not the case at all. The twelve signs are obviously named after the twelve constellations that once coincided with these arcs--when 0 degrees of Aries was indeed also the beginning point of the vernal equinox. But, as many anti-astrological skeptics gleefully point out, the equinoxial beginning point has moved against the constellational background due to a long-term astronomical phenomenon called the Precession of the Equinoxial Point. This point slowly moves backward (over approximately 25,000 years) through the celestial constellations.

And so the actual astrological beginning point of the signs' influences is not derived from their background of stars and constellations, but from some conditions of momentum and gravitation within the Earth by virtue of its annual revolution around the Sun. Which is to say, that the constellations are not the zodiac, and that the zodiac is based not upon astronomical factors per se, but upon some consistencies having to do with *seasonal* changes on Earth.

The beginning, or starting point, of counting around the 360 degrees of the zodiacal beltway is always referred to as 0 degrees Aries, the beginning day of spring always known as the vernal equinox. The zodiac, then, is the "belt" of that part of the celestial sphere that encompasses the paths of all the planets (the "wandering stars" of the ancients) as they orbit the Sun in relation to the vernal equinox, and not in relation to the constellations. The center of the belt is the

Sun's apparent orbit, called the "ecliptic" or the Sun's path, as it is seen geocentrically to move around the Earth (or the orbit of Earth as it would be seen heliocentrically from the Sun). The zodiac belt extends 9 degrees above (north) and beneath (south) of the ecliptic, since the planets in their orbits incline and decline that much as they pursue their orbits.

Since at least the time of Hipparchus (2nd century AD), the greatest of the ancient astronomers, this belt has been divided into twelve 30-degree arcs, or signs, measured from the vernal equinox, and which altogether total 360 degrees. Here arises another somewhat confusing matter that so far has never been explained. The apparent motion of the Sun around the zodiac is actually Earth's motion through it.

But the zodiac time-terms are based on where the Sun is "at" at the vernal equinox (0 degrees Aries), at the summer solstice (0 degrees Cancer), at the autumnal equinox (0 degrees Libra), and at the winter solstice (0 degrees Capricorn). In zodiac "time" terms, the circular zodiac is divided equally into four 90-degree arcs as any circle would be, and is not apportioned according to the actual motion of the solar-Earth year.

The zodiac, then, is only secondarily based on the apparent daily motion of the Sun, and is principally "sensitive" to the great seasonal change-points that demark spring, summer, autumn, and winter. And, in fact, the great iconography or images of the signs of the zodiac are principally derived from the values and meanings of the four seasons, not from the apparent motion of the Sun against the celestial background. Clearly, then, the zodiac is a function of the Earth's inclination and gravitational motion relative to the Sun that also incorporates all the planets orbiting the Sun, and is not principally a function relative to the far-distant celestial constellations.

The Megaliths

Archeologists and investigators who specialize in researching megalithic monuments will already have realized that very many of them were constructed with special features to indicate the exact day

of at least the vernal and autumnal equinoxes and the two solstices–which are also the four principal points of any zodiac. Such megalithic monuments are thus some kind of zodiacal-astrological ones, and not merely or only astronomical-calendrical calculation edifices.

That this is adamantly the case can be understood very easily. If these same edifices were utilized to take note of the solar astronomical year, then their functions would quickly be "off" by five or six days–a discrepancy that would surely have been understood by the megalithic engineers who contrived the astonishing feats of heaving the gigantic megalithic monuments into place.

In this sense, then, more meaning was attributed to the tilting of Earth on its axis than to the solar year that was five to six days longer by direct observation then as now. The enormous megalithic edifices, then, are zodiacal ones, and anything zodiacal implies some form of astrological awareness and purpose beyond merely counting the astronomical days it takes to complete the slightly longer solar year.

Furthermore, to my knowledge, all of the known megalithic edifices are ring-like in form and dimension, and many of them are divided into sections radiantly, as is clearly the case of Stonehenge and Mount Pleasant Henge. The circularized construction at Newgrange as well is so exactly oriented to the zodiacal change-points as to accurately reflect them to this very day.

The zodiac, in any form, is the centerpiece not of astronomy, but of some kind of astrology that imputes meaning, and not only measurement, to factors having to do with Earth's axis tilt and resulting seasonal change-points. To continue to refer to such structures as solar calendrical ones only is to deny the mathematics and resulting engineering that obviously were involved in their construction.

The fact that these enormous edifices were constructed with data-meaning, not just calendrial counting, in mind is evidenced by the scope and massiveness of some of the megalithic monuments, called such because they are monumental. Contrasted to these enormous monuments is the fact that Earth's maximum northern and southern tilt could, with trial and error, be determined by the shadows of two

sticks placed upward in the ground about ten to twenty feet apart. The two shadows would coincide northward or southward exactly on only two days of the year–the two equinoxes.

Why render into monumental stone constructions or into artificial mounds what could more easily be determined by sticks in the ground? Well, Earth undergoes enormous geo-electromagnetic shifs at the four points of the equinoxes, and these have meaning to biological and psychological life. Those who favor a Greek etymological origin for "zodiac" link it to the term zoon, which, if difficult of translation, was associated in ancient Greece with the idea of "life" or with "living beings." Indeed, the twelve different parts of the Greek zodiac pictured a series of beings which, like the Cerubim of Ezekiel, were held to "dwell" outside of time, with the limits of time being marked in the ancient cosmoconception by the Sphere of Saturn. Geo-electromagnetic forces are certainly "outside" of time, as it is experienced in the human life cycle, and it is the zodiac "time" which reflects some sort of celestial-terrestrial, geo-electromagnetic, correlation-knowledge, whereas solar chronological time alone can reflect nothing of the kind.

I may be speaking out of my hat, but it is feasible to assume that the massiveness of the megalithic constructions was somehow commensurate with the important or ultraimportant meanings implied by the massiveness. Megalithic edifices, such as Stonehenge, could not have been an easy undertaking; to say nothing of the Glastonbury zodiac. This particular zodiac consists of constructed mound-figures stretched over the Vale of Avalon in a great circle ten miles in diameter, the largest of the giant figures being five miles across. It portrays, in the correct order, the twelve signs of the zodiac, with a thirteenth lying outside of the circle, this being the "great dog of Langport," who guards the sacred abode of Annwn, just as Cerberus guarded the gates of Hades.

In ending, contemporary astrologers may be the first of the species that do not literally watch the heavens or the wandering stars moving in the zodiac beltway. Instead, myself included, we "watch" ephemerides and meanings printed in books, and even more recently, watch computer printouts of horoscopes and astro-statistics. Indeed,

at many places on Earth today, the full splendor of the night skies is blotted out by artificial light and atmospheric pollution.

All megalithic and ancient astronomical-astrological structures, wherever they are found, were built in such ways that the celestial sphere could be watched from them. There would be a great difference between "watching," for example, a conjunction of Saturn and Jupiter occurring in an ephemeris, and watching one literally rising on the eastern horizon at night. The former "watching" involves only the mind-intellect, but the latter easily could inspire deeper and fuller sensorium prophetic, forecasting, or divinatory episodes that would clearly be of an inspired or "psychic" nature.

Commentary

by William Corliss

Unless you have been comatose the past several years, you must know that the entire outlook of science is in flux. The words "chaos" and "complexity" are the current buzzwords. They betoken, finally, the formal recognition by science that nature is frequently:

- Unpredictable (as in weather forecasting beyond a few days)
- Complex (as in any life form)
- Nonlinear (as in just about all *real* natural phenomena)
- Discontinuous (as in saltations in the fossil record)
- Out of Equilibrium (as in *real* economics and even the natural world).

Eroding fast are the philosophical foundation stones of the clockwork universe: the idea that nature is in balance, that geological processes are uniformitarian, that life evolved in small random steps, and that the cosmos is deterministic.

My view is that anomaly research, while not science per se, has the potential to destabilize paradigms and accelerate scientific change. Anomalies reveal nature as it really is: complex, chaotic, possibly even unplumbable. Anomalies also encourage the framing of rogue paradigms, such as morphic resonance and the steady-state universe. Anomaly research often transcends current scientific currency by celebrating bizarre and incongruous facets of nature, such as coincidence and seriality. However iconoclastic this point of view, the history of science tells us that future students of nature will laugh at our conservatism and lack of vision.

Adapted with permission from the preface of *Science Frontiers: Some Anomalies and Curiosities of Nature* by William R. Corliss.

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Paul Rydeen works as an engineer when he's not chasing flying saucers. He is a contributing editor to *Crash Collusion* magazine, and has published widely on various aspects of anomalous phenomena, conspiracies, and the arcane. He is currently editing an anthology of essays and fiction exploring the metaphysical aspects of late science fiction author Philip K. Dick's mystical contactee experiences. A Minnesota native, he currently lives with his family in the cultural eddies of the deep south.

Ingo Swann is a world-renowned artist and the psychic who helped pioneer the experimental design for "remote viewing" research at Stanford Research Institute and the American Society for Psychical Research. He is also the author of *Star Fire, Everybody's Guide to Natural ESP*, and *Your Nostradamus Factor*. An earlier version of "The Perils of Erasing Astrology from the Past" appeared in the *Mounds Newsletter*, 215 Hawthorne, Houston, TX 77006.

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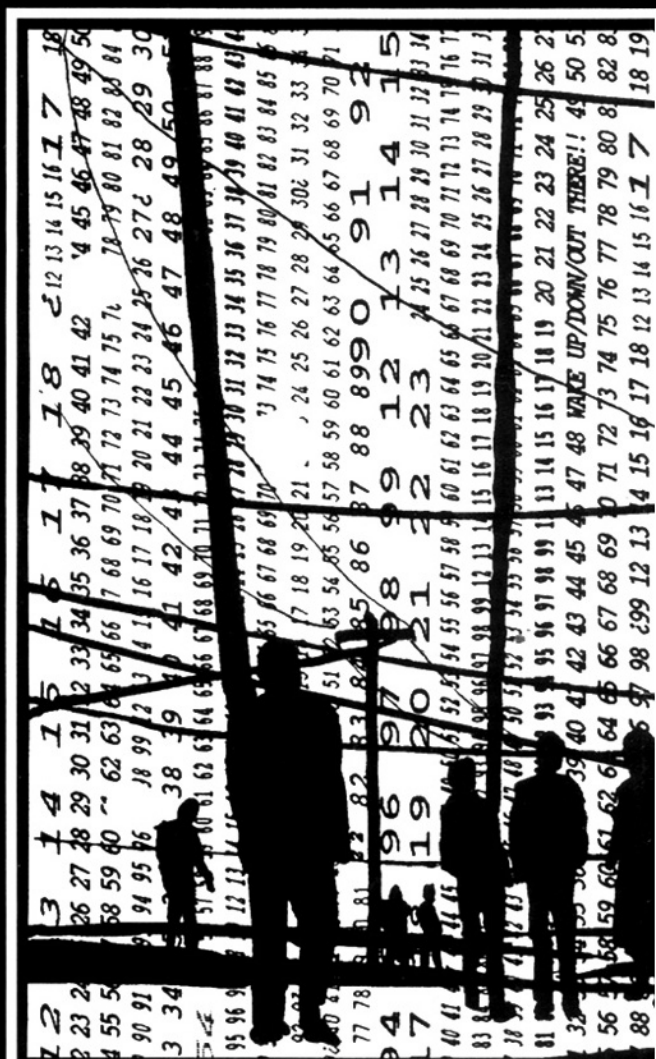

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