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* <http://abob.libs.uga.edu/bobk/ccc/cc060297.html>

Date sent: Mon, 02 Jun 1997 12:14:03 -0400 (EDT)
From: Benny J Peiser <B.J.PEISER@livjm.ac.uk>
Subject: LOUIS FRANK'S MINI COMETS STIR DEBATE
To: cambridge-conference@livjm.ac.uk
Priority: NORMAL

LOUIS FRANK'S MINI COMETS STIR NEW CONTROVERSY

Last week's press release about Louis Frank's latest research findings about watery and icy mini comets which are claimed to impact our atmosphere at a rate of one every three seconds(!), has provoked a new scientific controversy among astrophysicists. For the non-astronomer, it remains extremely difficult to assess whether or not Dr Frank's findings are based on valid interpretation of observational data or whether the evidence is still too ambiguous (as the skeptics have pointed out on this network).

Should Louis Frank's findings be corroborated, though, the implications would not only affect the understanding of our cosmic environment; it might also demonstrate - once again - the Kuhnian suggestion that astronomers tend to apply 'biased' observational technics which - in one way or another - simply mirror and compliment their personal views about the solar system. What is more, some dogmatic leaders in their field might even try to suppress contradictory evidence. Or how should one explain the reluctance of many astronomers to publish (never mind test) Dr Frank's theory? Let's hope that something good will come out of this debate - whatever its outcome - and that the great attention will now generate the essential tests.

I have attached Robert Matthews' essay about this latest controversy below. He not only describes the "unscientific approach" by Frank's fellow astronomers to his theory but also places this episode in its proper historical context within the ongoing debates about neo-catastrophism. The article appeared in yesterday's SUNDAY TELEGRAPH.

Benny J Peiser

THE SUNDAY TELEGRAPH, 1 June 1997

ICE CUBES FROM SPACE PROVE THE SCOFFERS WRONG

Robert Matthews

Many scientists are having to eat humble pie this weekend, following the revelation that the Earth is constantly pelted by cosmic snowballs the size of houses. And not before time either, as these same scientists have spent a decade disparaging Dr Louis Frank of Iowa University for his refusal to bow to orthodoxy and deny the evidence of his own eyes.

That evidence first emerged in 1982, when a student of Dr Frank's was analysing images of the Earth sent back by two Nasa satellites. To the student's frustration, many of the images were spoiled by tiny black dots. At first sight, they appeared to be faulty data, but careful study revealed that they behaved far too regularly to be dismissed as random flaws.

Instead, they appeared to be tiny comet-like objects that were striking the atmosphere at a rate of one every three seconds, each dumping tons of water on to the Earth.

For a few years, other researchers showed no more than polite interest in Frank's claims when they were mentioned at conferences. It was when he tried to get his research published in academic journals that Frank discovered the fate that awaits those who make radical claims in science.

The leading journal NATURE rejected his claims, saying that "a representative poll" had been taken of experts in the field and they had voted against publication. Frank's attempt to answer his critics with fresh evidence by using major telescopes were met with obstruction and foot-dragging, with astronomers insisting that the enterprise was a waste of time.

When Frank did succeed in getting access to a telescope, it revealed objects streaking across the atmosphere at 20,000mph - as he had predicted. It made no difference: the findings were still rejected for publication.

Now, after 10 years of obstruction and ridicule, it is Frank's turn to laugh. Cameras he designed aboard Nasa's Polar spacecraft have revealed the existence of the small comets beyond all doubt.

Spectacular images taken by cameras show the comets streaking into the atmosphere before dumping their water. They arrive at the rate of about one every three seconds - just as Frank had claimed.

Frank himself has always been surprisingly sanguine about the controversy, apparently taking the view that the "truth will out" (sic). But there is no getting around the fact that many scientists have taken a woefully unscientific approach to the whole issue.

While extraordinary claims must demand extraordinary evidence, the reluctance of many to consider Frank's evidence was matched only by their keenness to block his attempts to gather more.

Frank's experience in this quintessentially Strange but True story are far from unique. The whole issue of bombardment by cosmic debris is one that has always been dogged by mule-like intransigence dressed up as academic rigour.

Until the early 19th century, anyone claiming to have seen stones falling out of the sky was regarded as having had a few beers too many; the French Academy of Sciences even declared such claims to be a scientific absurdity.

When hundreds of stones were reported to have smashed on to the French village of L'Aigle in 1803, the Academy dispatched a young astronomer to debunk the story. He returned with bad news: the reports were correct. Everyone now accepts the existence of meteorites but the confirmation came too late to save hundreds of specimens from being unceremoniously thrown out of museums as "superstitious artefacts".

The now widely-accepted theory that a huge meteor struck the Earth 65 million years ago, pushing the dinosaurs into extinction, also came in for a least as much abuse as the idea of micro-comets when it was originally proposed.

When the late Nobel Prize-winning physicist Luis Alvarez and his team first published their evidence for the giant impact in 1980, one authority described it as "a nutty theory of pseudoscientists posing as paleontologists". Today it is the nutters who argue against it.

There is one aspect of the Earth bombardment issue that remains a source of incredulity among many scientists: the idea that humanity is under serious threat from meteor impacts. The sceptics are still demanding hard evidence for this threat. We can only hope that the "hard evidence" doesn't come in form of a billion-tonne meteor any time soon.

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Date sent: Mon, 2 Jun 1997 14:58:53 +0100 (BST)
To: cambridge-conference@livjm.ac.uk
From: ian@knowledge.co.uk (Ian Tresman)
Subject: Re: COMMENTS ON INTERPLANETARY SNOWBALLS

The following post appeared on another mailing list.
Ian Tresman.

Date: Mon, 2 Jun 1997 21:29:31 +1000
To: kronia-l@teleport.com
From: walt@netinfo.com.au (wal thornhill)
Subject: Re: COMMENTS ON INTERPLANETARY SNOWBALLS

Wal Thornhill comments:

I agree with Morrison and Harris that it is highly unlikely that Louis Frank has discovered an influx of icy comets.

I have not had time to refer to the many papers published by Dr. Frank but I would like to propose a novel idea which occurred to me on reading the report.

Some months ago I repeated part of an article I wrote in 1993 about red sprites and blue jets associated with powerful electrical storms:
"Low light cameras have captured discharges originating 14km above the Earth over storm clouds, rising like fountains another 20km into the stratosphere. Our Earth-centred view is exemplified by the researcher's comment that it is one way for the storm to dissipate energy into the magnetosphere. Instead, it would seem reasonable to suggest that storm clouds which span great heights offer a convenient path to ground for charge originating in the ionosphere. As further evidence of this phenomenon, in April 1990 the space shuttle photographed on the horizon:

a lightning bolt extending an estimated 31 kilometres into clear air above an isolated thunderstorm. At least 15 pilots have reported seeing such lightning at some time in their flying careers.

In the summer of 1992, two pilots flying at midnight at 41,000 feet, six miles from a storm cell, reported they:
were startled [to say the least] by a massive single stroke of vertical lightning coming straight out of the cell. Massive describes not only its 'thickness' but the altitude above us to which it seemed to penetrate. It seems reasonable to guess this thing went 20,000-30,000 [feet] above us, perfectly straight, no 'branches' and no 'flickering'.
.....All of these phenomena, collectively, seem to be an analogue of the electrical activity seen on the 'surface' of the sun. That is, the blue

jets are equivalent to spicules on the sun, which spew ions into the chromosphere to add charge carriers to the plasma in order to carry the electrical discharge load."

Now, one of the little known characteristics of an electrical discharge, as noted by Eric Crew in the case of earthly lightning, is that it compresses and accelerates ions from regions of high pressure to regions of lower pressure. The holes being punched in the ionosphere and showing evidence of ions associated with water would be expected on the model I proposed, where the blue jets would spew atmospheric ions, including water ions from much lower levels in the atmosphere, into the ionosphere.

I am suggesting that the water is not being dumped into the ionosphere from space, but from the Earth itself. It would be of great interest to see if the two phenomena can be correlated.

Wal Thornhill

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Date sent: Mon, 02 Jun 1997 09:03:32 -0400 (EDT)
From: Benny J Peiser <B.J.PEISER@livjm.ac.uk>
Subject: NEO News (5/31/97)
To: cambridge-conference@livjm.ac.uk
Priority: NORMAL

from David Morrison <dmorrison@mail.arc.nasa.gov>:

Dear friends and students of NEOs:

The interest is certainly high in my earlier message dealing with the purported mini-comets. The consensus among the NEO astronomers I have heard from is that there cannot be such a number of comets in near-earth space or we would have seen them. Also, in striking the Moon they would either saturate the mare surface with small craters and/or erode the surface dramatically. My friends in earth science also say that the purported amount of water added to the stratosphere is orders of magnitude outside the bounds set by observations. Here are two more notes with with additional information.

David Morrison

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From Dick Kerr, Science Magazine:

You might want to direct your readers to my story in Science on Frank's small comets. It takes a far more critical slant than the rest of the coverage I've seen. It is in today's issue--Science, 30 May 1997, p. 1333-1334--being mailed today. Those who have paid their extra \$12 per year can see it at www.sciencemag.org right now. A shortened version is available at our ScienceNOW site free to non-subscribers.

Al Harris makes some good points, but Lou Frank has long ago covered the tracks of his small comets, although most people would say he's appealing to some pretty strange physics to do so. He still has trouble hiding that much water and kinetic energy, though it isn't as bad as Al calculates. Frank now invokes an electrostatic interaction with near-Earth plasma to break up small comets high above the atmosphere. I don't know how much sense it makes, but he no longer requires tidal forces. Small comets' albedo is inferred to be 0.02 to 0.005. By my calculation, using his earlier 20 hits per minute, Earth would have accumulated only 0.02% of its mass and sea level would be rising only one-thousandth of a millimeter per year.

Whatever the right numbers, people are generally outraged at the implications of small comets, even if the observations of some new phenomenon high in Earth's atmosphere are now believable. The most direct and readily accessible test of the hypothesis is a telescopic search exactly like that done by the late Clayne Yeates. Frank thinks Yeates found them, so a negative search with current technology should be definitive. If anybody has such results or is planning them, I'd like to hear about them.

Dick Kerr

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From Jeff Bell, U. Hawaii:

For those new to the controversy over Lou Frank's mini-comet hypothesis, I suggest the following review articles:

Dessler A. J. (1991) Reviews of Geophysics 29, 355-382
Frank L. A. & Sigwarth J. B. (1993) Reviews of Geophysics 31, 1-28

For a more frank version of Frank's views, see his popular book THE BIG SPLASH (Birch Lane Press, 1990)

Here are some more references for the truly dedicated:

Geophysical Research Letters
13, 303-310
13, 555-560
13, 701-704
13, 976-988
13, 1075-1082
13, 1181-1189
13, 1482-1486
14, 162-167
14, 573-580 (correction on p. 784)
14, 779-782
17, 1173-1174
17, 2257-2260
Reviews of Geophysics 26, 249-283
Nature 330,548-550
Planetary and Space Science 37, 1185-1196
Astronomy and Astrophysics 238, 522-530
Science 240, 1403-1404
Science 241, 532
Science 243, 170-171
Australian Physicist 26, 19-34

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Date sent: Mon, 02 Jun 1997 08:59:31 -0400 (EDT)
From: Benny J Peiser <B.J.PEISER@livjm.ac.uk>
Subject: NEO News (5/30/97)
To: cambridge-conference@livjm.ac.uk
Priority: NORMAL

from David Morrison [Director of Space, NASA Ames Research Centre]
<dmorrison@mail.arc.nasa.gov>:

COMMENTS ON INTERPLANETARY SNOWBALLS

It should be remembered that Lou Frank has not detected mini-comets directly, and at issue should be his interpretation of the spacecraft data. This has been missed in most of the press reports I have seen, which assume that his mini-comet hypothesis of 1986 is now verified. But we must remember that the impact rate proposed by Lou Frank for 5-m comets is about a million times greater than that given by a power-law size distribution, which is well anchored by observations of objects just an order of magnitude higher than the sizes that Frank suggests are so abundant. Is it physically possible for the numbers of NEOs to increase by six orders of magnitude in the one order of magnitude size range from 50 m to 5 m

diameter? I think we should all be skeptical. I look forward to seeing a refereed, published paper on these results and their interpretation. And we should all ask if these objects could have been missed by other detection techniques, including our eyeballs looking up at the night sky. After all, he is talking about roughly Hiroshima size flashes happening at a rate of 10 per minute, rather than the accepted rate of once every few months. How could these have been missed?

David Morrison

Following are some additional comments from Al Harris (JPL):

1. If they are there we should see them. We know within a factor of a few what the flux of ~5m sized objects is. We may arguably not know if they are ice or rock or metal, or their density, or their albedos, but within reasonable limits we certainly know the numbers to better than an order of magnitude, and Frank's numbers are a million or so too high. If there really were that many 5 m objects out there, even at albedo 0.05, you should be able to see several in an evening scanning the sky with binoculars: about one per 400 sq. deg. at magnitude 8.5, and moving at about the speed of a slow earth satellite.
2. Nothing breaks up at "600 to 15,000 miles above the Earth." Not even icy fluff balls, certainly not a 5 meter object which weighs 30 tons. Anything so weak as to come apart in that environment wouldn't stay intact even in heliocentric orbit.
3. The mass he proposes (~10/minute impacts of ~30 tons) adds up to a fair fraction of the Earth's mass (~10-20%) in the age of the solar system. That's about 1 cm of water a decade, which is measurable. The oceans aren't rising that fast, and certainly haven't for a geologically significant length of time.

[CCCMENU CCC for 1997](#)

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