

Afghan Rescue Fund Saves Lives

In early September 2021, the Center for Inquiry (CFI) announced an initiative to respond to the humanitarian catastrophe that was unfolding in Afghanistan: the Afghan Rescue Fund. Coordinating with David Cowan, a CFI board member and producer of the documentary film *Afghan Dreamers*, CFI asked the secular and skeptic communities to help with the safe relocation of Afghan families endangered by the collapse of the government and the oppression of a theocratic regime.

Richard Dawkins, a CFI board member, asked us to “look beyond our national identities and embrace the opportunity to help our fellow human beings. An entire nation collapsing under the weight of theocratic oppression is a moral emergency. ... Our community will answer that call.”

And you did. And you are.



We at CFI can't risk giving too many details about the people who have been rescued, relocated, and given assistance, but we are very proud to say

that dozens of Afghan refugees have been helped as a direct result of the Afghan Rescue Fund and the generosity of this community.

SPECIAL REPORT]

Sodom Meteor Strike Claims Should Be Taken with a Pillar of Salt

A controversial, widely publicized paper claiming that a cosmic impact destroyed a biblical city has had key images photoshopped and rotated to fit the biblical hypothesis.

MARK BOSLOUGH

On September 20, 2021, the open access journal *Scientific Reports* posted a paper titled “A Tunguska Sized Airburst Destroyed Tall el-Hammam a Middle Bronze Age City in the Jordan Valley Near the Dead Sea”

(Bunch et al. 2021). The paper cited the Bible as possibly containing a written record of the destruction: “We consider whether oral traditions about the destruction of this urban city by a cosmic object might be the source of the written version

of Sodom in Genesis.”

The paper's team, led by Ted Bunch of Northern Arizona University, had twenty-one authors, most of whom are credible scientists from respected institutions. Most are also proponents of a controver-

sial hypothesis that an impact or airburst was responsible for a mass extinction of North American mammals and abrupt climate change at the Younger Dryas boundary 12,900 years ago.

The story was pitched by one author's institutional news organization's publication, *The Current* of UC Santa Barbara, which played up the Sodom connection with the title "Researchers Present Evidence That a Cosmic Impact Destroyed a Biblical City in the Jordan Valley." A subsection titled "Fire and Brimstone" helpfully reminded us that Lot's wife was, according to the Bible, turned into a pillar of salt.

This formula could not have worked better. Within a day it had generated worldwide coverage by media ranging from internet clickbait to *Newsweek*, *National Review*, and *Forbes*. Within a week, the online data tracker Altmetric showed that it had been accessed 242,000 times, putting it in the 99.98 percentile of tracked articles of similar age in all journals. One of the paper's authors, on his blog, declared, "For the time being, arguably, its [*sic*] the most read scientific paper on earth."

When the paper dropped into my inbox on the day of publication, one sentence in the abstract stood out: "Tunguska-scale airbursts can devastate entire cities/regions and thus, pose a severe modern-day hazard." Because this is my area of expertise and has been the subject of my research for decades, I thought I'd better give the paper a thorough read. I posted comment threads on Twitter as I went, which caught the attention of other scientists and skeptics. Together we quickly made a disturbing discovery: Images from the Tall el-Hammam excavation had been photoshopped and rotated to match the hypothetical compass direction of the supposed blast.

As I was entering the new field of planetary impact hazards in 1994, physicist and CSI Fellow Robert Park was the lead author of a book chapter that asked, "Can Defense against Asteroids Be Sustained?" Park pointed out that our community must overcome the "giggle factor" to persuade leaders to take the hazard

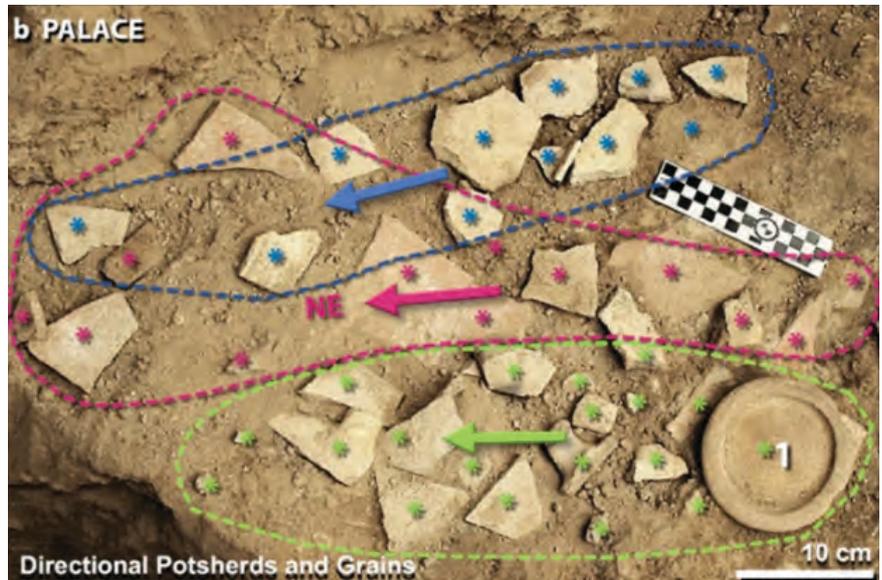


Figure 15b as published by Bunch et al. [2021]. Bunch et al. supported their claim of a blast directed to the NE by adding NE arrow annotation, but it contradicts the north arrow they cropped out.

seriously, and scientists should focus on public education. Fearmongering may sell newspapers with headlines such as "doomsday rock" and "killer comet," but that only undermines the credibility of the scientific community on this issue.

Fortunately, there are organizations such as Asteroid Day and the B612 Foundation that are focused on facts, public education, outreach, and research. But a recently created Comet Research Group (CRG) has discovered that fearmongering is an effective fundraising tool for their fringe investigations despite its potential damage to the credibility of serious scientists engaged in planetary defense.

The CRG Indiegogo page says:

Killer Comets are Coming ... Killer comets are a threat to Earth's cities. Help do something about them ... Killer comets are more common than you've been taught. Our mission is to prove it and to do something about it before your city is next ... We are in serious danger, but with your help we can do something about it.

CRG is not engaged in planetary defense but was nevertheless able to raise over \$35,000 for expeditions to "look for comet fragments," including a "Fire from the Sky Expedition" to the Middle East. This probably refers to the Tall el-Hammam Excavation Project (TeHEP) a joint

undertaking between Trinity Southwest University (TSU) and Veritas International University (VIU). Seven members of CRG and coauthors of Bunch et al. (2021) traveled to Jordan to participate in a TeHEP dig, apparently to look for comet fragments as part of their mission to prove that killer comets are more common than you've been taught.

TSU is an unaccredited evangelical Christian institution located in an Albuquerque, New Mexico, strip mall. Part of its mission statement is "to uphold the divine authority of the Bible as God's only inspired representation of reality to humankind."

VIU (formerly Veritas Evangelical Seminary) is a Christian institution in a Santa Ana, California, office park. It is dedicated to biblical inerrancy, the belief that the Bible is without error. The VIU website states:

Inerrancy simply cannot be rejected without grave consequences, both to the individual and to the Church ... This inerrancy isn't just in passages that speak about salvation, but also applies to all historical and scientific statements as well. It is not only accurate in matters related to faith and practice, but it is accurate and without error regarding any statement, period.

The agendas of the organizations that

lead TeHEP are not hidden from sponsors or amateur excavation volunteers; indeed, the GoFundMe page asks potential donors to consider giving money to their “Dig Sodom” project to “help us prove the veracity of the Bible.”

The chief archaeologist and director of TeHEP is Steven Collins, whose CV is posted online. It shows that he has served as executive dean of TSU since 1990, the same institution that granted his PhD in Archaeology and Biblical History in 1997. He is also director of the PhD program in Archaeology and Biblical History at VIU.

Collins conceived the notion that Tall el-Hammam is the biblical Sodom and was destroyed by an airburst from an incoming object from space. In 2014, he told *Popular Archaeology*, “We now have a slew of research scientists who specialize in this kind of thing working on samples from Hammam at several major university labs across the country. The interest that our ‘airburst’ is generating is quite amazing.” But according to the article’s author, “scholarly consensus on this remains elusive, to say the least.” It is not clear why Collins, who came up with the idea and directed the dig, was not a coauthor of the Bunch et al. paper.

The CRG is registered to Rising Light Group, a tax-exempt organization with a website that links to religious sources, including *Biblical Archaeology Review*, where it features a splash page showing Jesus’s crucifixion. Rising Light is registered to Allen West, who is also cofounder and director of CRG.

West’s background is a puzzle because of his lack of a published CV. According to the group’s blogger (listed as another cofounder and director of CRG) in response to questions about West’s background, “Allen never claimed he was any more credentialed than he was—the first time I spoke with him he claimed only a philosophy doctorate from an obscure school in Nebraska.” West was quoted in a widely circulated email with more information:

I don’t have a doctorate in science; I was trained in geophysics while on the job, and worked for most of my

career as a geophysical consultant. I also owned a licensed Texas consulting company for the oil-and-gas business. ... I do have a doctorate in philosophy from a Bible college in Nebraska.

The earliest appearance of Allen West in my Google searches is 2006, related to a book he coauthored with nuclear chemist Richard Firestone titled *Cycle of Cosmic Catastrophes: How a Stone-Age Comet Changed the Course of World Culture*.

West, like Collins, has a knack for coming up with ideas that get explosive media coverage but are met with scientific skepticism from subject matter experts. According to CSI Fellow David Morrison (“Did a Cosmic Impact Kill the Mammoths?” *SI*, May/June 2010), “This book develops Firestone’s 2001 suggestion that a cosmic ray catastrophe, probably caused by a supernova, occurred in northeastern North America in the late Pleistocene.”

For a self-taught scientist, West has demonstrated an exceptional gift for finding evidence that trained geologists miss when doing field work and for being able to tease out information that trained analysts fail to see in the lab. At the May 2007 American Geophysical Union Joint Assembly in Acapulco, West joined his coauthor Firestone at a press conference to announce the discovery of evidence that a giant comet impact or airburst wiped out the Clovis culture and led to the extinction of megafauna across North America, including woolly mammoths.

A reporter asked, “Why is this the first we’ve heard of this?” According to Firestone, the work stopped after 2001 because “we didn’t have enough information.” But all that changed around 2004 when “Allen got involved.” He continued, “Allen was our field man and got out there and took all the samples and dug in the dirt and figured out how to find a lot. ... Allen got a lot of the samples that we have studied and has figured out not only how to analyze these samples but how to understand these samples.”

That was only the beginning of West’s rapid and remarkable rise to fame. While working alone in a Calgary fossil ware-

house he was visiting for the filming of the National Geographic documentary *Mammoth Mystery* (broadcast in October 2007), he found mammoth tusks with embedded micrometeorites he’d predicted and attributed to the cosmic explosion he’d proposed.

The following year, he announced the discovery of nanodiamonds as confirming evidence for a continent-wide impact event. Later that year, he was invited to participate in a PBS *NOVA* episode on his discoveries, “Megabeasts’ Sudden Death,” in which the narrator described West’s unique scientific prowess as he was shown on screen with a rock hammer collecting samples and then shipping them to analytical labs: “In the past three years, West has dug into his retirement savings, shipping boxes of dirt to colleagues around the world, trying to solve the mystery. West has become his very own FedEx hub of Ice Age dirt.”

NOVA flew two glacier experts to Greenland to look for evidence of an impact in the ice layer from that time. The researchers emphasized how unlikely it would be to find the exact layer but collected samples they hoped were the right age and sent them to West to prepare.

NOVA narrator:

Now it comes down to the nanodiamonds, which are also the hardest to process. Searching through samples from a seventeen-meter trench for evidence that is a million times smaller than a grain of sand is a very, very painstaking process. That job fell to Allen West. ... The meticulous work is finally done, and West has managed to prepare samples for the transmission electron microscope.

In the climactic scene, the team sees hexagonal nanodiamonds on the screen, bringing one of them to tears. West had hit another one out of the park on his very first swing. That was in 2008. As of 2021, this discovery has never been replicated, even by the same group.

West’s other claims also unraveled as skeptical scientists published papers showing that some of his diamonds were actually graphene, carbon spherules were actually fungus and bug poop, there weren’t significant concentrations of other

Fig. 15b, cropped rotated original



Altered image to remove red arrow and fill corners



One of seven sets of original and altered images uploaded to PubPeer by Allen West in response to criticisms. We know from other images that the red object at the bottom of the original is a north arrow that points to ten o'clock.

claimed impact markers, and samples that were supposed to be 12,900 years old contained modern carbon.

In 2011, science journalist Rex Dalton published a stunning revelation:

The team's established scientists are so wedded to the theory they have opted to ignore the fact their colleague "Allen West" isn't exactly who he says he is. West is Allen Whitt—who, in 2002, was fined by California and convicted for masquerading as a state-licensed geologist when he charged small-town officials fat fees for water studies. (Dalton 2011)

For many of us, that was the end of the story. We no longer trusted any data that West had handled. For me, it was like looking at the Necker cube illusion and never being able to see it the old way again. When *NOVA* found out, they pulled the plug on "Megabeasts." But most of his coauthors either didn't care or circled the wagons and kept publishing with him, even growing their collaborations to include biblical archaeologists excavating ruins in the Middle East, leading to the Sodom airburst paper.

One longtime collaborator, Christopher Moore, was the lead author of an article published on the day of the paper's release in *The Conversation* ("Academic rigor, journalistic flair"), titled "A Giant Space Rock Demolished an Ancient Middle Eastern City and Everyone in It—Possibly Inspiring the Biblical Story of Sodom" (Moore et al. 2021).

One commenter quoted Rex Dalton's article about West's conviction. West responded with the claim that "there was no conviction and no fraud then or now" because he was able to get it expunged from his criminal record. In fact, the motion for expungement included West's sworn statement under penalty of perjury that said, "On March 4, 2002, I was convicted in the Superior Court of the County of San Bernardino of the charge of violation of Business and Professional Code section 17500." Expungements do not change history.

One of the first things I noticed in the Sodom paper was that the authors had completely misunderstood or misrepresented my airburst models. As I dug further, I discovered that it was deeply flawed in many other ways. Because of my skepticism about West, I sent a link to image forensic specialist Elisabeth Bik, who has recently gotten a lot of attention for her success at identifying scientific misconduct and getting papers retracted (Shen 2020). Bik quickly found repetitive elements in some of the field photographs that indicate digital tampering (Bik 2021). Her discovery was immediately denied by one coauthor: "The accusation that the image was photoshopped is categorically false." But it was soon confirmed by another author, the blogger, who dismissed it as an inconsequential "Pebblegate" with this explanation: "Our graphic artist made minor, cosmetic corrections to

five of fifty-three images."

Finally, West weighed in by revealing earlier versions of seven out of the eighteen photographs taken in the field that had been digitally altered. He showed the images along with the modified versions, claiming, "We altered no crucial data, such as bones and potsherds." But the photos tell a different story. Metadata is crucial data, and four of the seven images had the north arrows used by archaeologists to orient images digitally edited out.

The Sodom airburst hypothesis, to satisfy biblical inerrancy, also required an influx of the salt that turned Lot's wife into a pillar, and for that the explosion needed to be over the northern Dead Sea, which is to the southwest. Dig director Collins, in his June 5, 2020, "Towelng Down Episode 2" video, said, "It came from the southwest. ... One of the most important things is the directionality."

With no north arrows, photos can be reoriented, as was clearly done for their figure 44c (see p. 14), which has shadows indicating the sun would be shining from an impossible direction at that latitude in January. Innocent explanations involving mistakes cannot be ruled out, which is why original digital files of the photographs with intact metadata must be provided to independent researchers. Several of my colleagues have requested this information from West, who is corresponding author for this paper.

Nevertheless, these biblically correct

rotations of images satisfy the dictates of all three sponsoring organizations, paraphrased here:

CRG: Our mission is to prove that killer comets are more common than you've been taught.

TSU: The Bible is God's only inspired representation of reality to humankind.

VIU: Biblical inerrancy applies to all historical and scientific statements.

I'm aware of many additional critical comments about this paper by other subject matter experts, including geologists and archaeologists, some of which have already been submitted for publication. The undisclosed and inappropriate digital tampering of images suggests the possibility of similar mishandling of other evidence.

As a longtime contributor to planetary defense, I was the first to suggest that airbursts have an outsized contribution to impact risk and to advocate looking for evidence of prehistoric airbursts in the geologic record. I'm concerned that this paper will contribute to a new "giggle factor" that undermines the credibility of my community. I have coauthored papers about geologic evidence for two airbursts in Egypt. And a new paper has just been published by my colleagues who have discovered evidence for an ancient airburst in Chile (Schultz et al. 2021). Cosmic airbursts are real—and should be taken seriously.

But claims made about a Sodom meteor strike should be taken with a pillar of salt. ■

Acknowledgments

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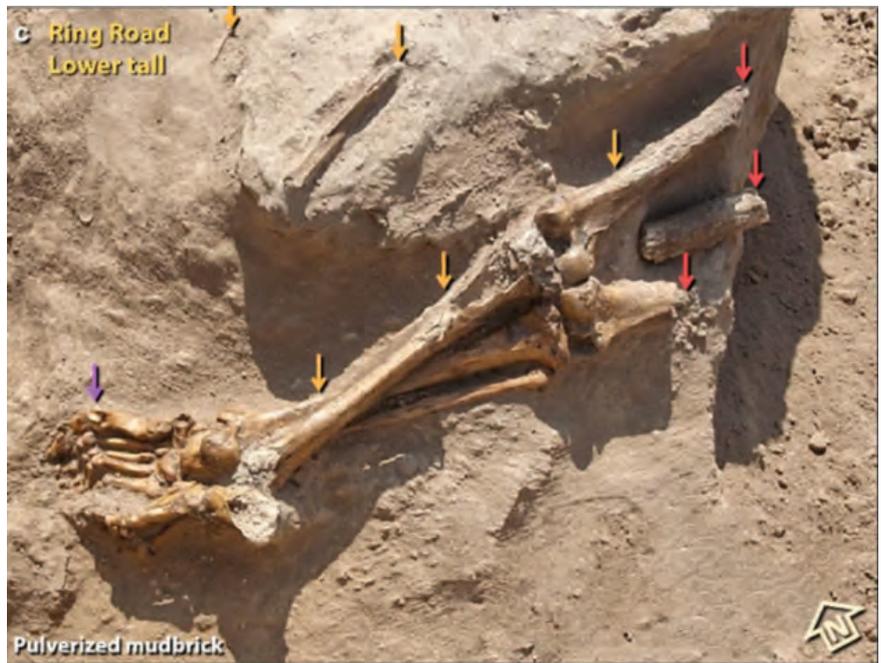


Figure 44c as published by Bunch et al., which was also photoshopped. Sun angle can be inferred from shadows but contradicts the north arrow annotation added by Bunch et al. to the image taken at Tall el-Hammam latitude in winter. Colored arrows are annotations added by Bunch et al. to point out features in the photograph.

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Mark Boslough pioneered the modeling and popularized the understanding of cosmic airbursts. He has contributed to NASA- and DOE-funded impact research and planetary defense programs for four decades at Caltech, Sandia National Laboratories, Los Alamos National Laboratory, and the University of New Mexico. He is a fellow of the Committee for Skeptical Inquiry. Asteroid 73520 Boslough [2003 MB1] was named in his honor. He can be found on twitter @MarkBoslough.