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FLIR:Mike McNulty responds

by John Blanton

Turns out it's a small world after all.

The January issue of *The North Texas Skeptic* had been out a few days when I received a phone call from Mike McNulty. McNulty is the writer and award winning producer of three documentaries related to the Branch Davidian siege near Waco in 1993. He wanted to clear up a few points I had touched on in the January issue in an article titled *FLIR*.

In *FLIR* I had reviewed McNulty's documentary of the same name, and I had noted some discrepancies between points made in the video and what had reasonably been demonstrated. In mid-January we discussed his concerns in a brief phone conversation. I followed up the conversation with a short e-mail recapitulating the points discussed. Here is that e-mail edited a bit:

1. I mentioned you say in your video that federal police deliberately killed innocent BDs on 19 April 1993. You deny it says that. You say the video only states that to a great degree of certainty that is what happened.

2. I asked about the hot gun barrels that show up bright in your video but do not show up at all in the 19 April video. You said the gun barrels are too narrow (about 1/2 inch) to make an image from that distance. You emphasized the 19 April video was from over 4000 feet away. You did not touch on the fact that this was with a telescopic imaging system that effectively removed most of that 4000 feet. I pointed out that object size is not what determines whether a bright object will show up in the image. Rather it is the total amount of energy that reaches the image plane. I asked if you knew anything about stellar astronomy where (up to recently) even the biggest telescopes produce only point images of stars, yet the stars still produce an

image on the plate/sensor array. You said stellar astronomy does not count because that is done with visible light, not IR. I told you your knowledge on this topic is incorrect.

3. You objected to my contention that the dust conditions on 19 April were nowhere near the conditions of your (COPS L.L.P.) tests, where they kicked up dust in front of a weapon before firing it. You also said dust on 19 April would have coated objects on the ground, suppressing any glint. Ergo, the flashes seen in the 19 April video were gun fire.

4. In response to my question as to why some agents on 19 April risked their lives to save BDs from the fire while others were using automatic weapons to finish off the survivors, you said their actions depended on whether they could be seen by the TV cameras. We did not discuss how these Keystone Cops on 19 April knew the exact location of every TV camera at every instant.

5. I brought up the issue of BDs being killed by BDs. Specifically I asked "Who killed Vernon Howell?" You said the children in the bunker were not shot, and you mentioned some autopsy data concerning other BDs in the compound. That is still unresolved. My information on this is based solely on newspaper reports of the findings of the investigators.

6. I mentioned my information that both 14-inch barrel weapons and 20-inch barrel weapons were tested at Fort Hood. Your video states the Fort Hood tests did not incorporate the 14-inch barrel weapons, which would have a more pronounced muzzle flash. You contend that Senator Danforth's commission required the short barrels be used, but they were not. You disregard the FBI's statement that the short barrels were also tested at Fort Hood.

McNulty noted that he was pressed for time due to work commitments (new project coming up), and he would not be able to respond directly. He did say in his response to my e-mail he was forwarding my note to his experts for consideration. He did provide the following comments in his response:

I am sorry that I can't give you more than this. I'm up to my eyes trying to get the final report on this subject off to Congress and other important items...

I can't comment in the detail needed on your "Phone recap", there are a number of misconceptions and errors... I just don't have time to walk you through them.

I think this might be helpful though, go to the S.P.I.E organizations web site and look up vol. 4370. There you will find Fred Zegal's papers on the tests, Barbara Grant's and David Hardy's independent material and on the Government's side, Dr. Klasen and Mr. Frankel's material on the "recreation." Once again, I would also recommend looking at the Danforth Preliminary report, the Danforth Final report and the Protocol agreement and the Vector Data Systems report and the Federal Judge's (Walter Smith) final ruling.

Regarding your item # 2 about hot gun barrels being or not being visible to the FLIR used by the FBI - the issue is Spatial Resolution of the sensor. There is not really any relativity to the magnification used in conjunction with the ocular portion of the instrument. The issue here is the detector footprint relative to the size of an object on the ground. Please see Barbara Grant's work for more on this subject.

Sorry I can't be of more help right now, but again, I think the final report to the Congress may be of further assistance to your understanding of this issue and the sited papers above will definitely round out your knowledge on the subject. ¹

McNulty copied Barbara Grant, David T. Hardy, and Fred Zegel on this e-mail, and I subsequently received some comments from Hardy:

I'm sorta popping in on this conversation at the last minute, and this is not my field, but....

Barbara Grant calculates the "footprint" (I believe the term is IFOV, Instantaneous Field of View, but again,

this is not my field) of each sensor element and pixel on the Waco FLIR at between 9" and 20" on the ground, depending upon the aircraft altitude and slant angle. Even at the former, a CAR-15 barrel would only be about 1/18 pixel wide and shy of two pixels long.

A half-inch wide hot object is going to be emitting photons ... but represents only a small part of each element/pixel. It may not be enough to raise the brightness of the *entire pixel*, and thus may not appear. Mike's later tests were filmed at much closer range, where the gun barrels completely fill multiple pixels, so that they are seeing an area entirely filled by the photon emitters.

The analogy in ordinary photography would be a light source that, projected on the film, was much smaller than a silver halide grain. At some point, the source might be bright enough to darken the grain, but shy of that, it would not, even though it would have done so if its absolute brightness were the same and its projected size enough to cover the entire grain. Given the size of silver halide grains vs. those of detector elements, this is a lot less likely to occur in practice.

Hardy is right. This is not his field. Hardy is a former federal attorney who has written a book, *This Is Not An Assault*, that is critical of the government's actions during the siege, and his knowledge relating to optics and imaging systems is about on par with McNulty's. ²

I pointed out in response that a 1/2-inch gun barrel would cover 1/18 of a pixel of the FLIR imaging system, given McNulty's comments above are true. FLIR imaging systems typically have dynamic ranges of 256 to 1024 and above, meaning that an object that is hot enough to saturate (e.g., 256 signal level) the FLIR sensitivity would register (with a signal level of about 15) if it covers 1/18 of a pixel. The Waco FLIR showed no hot gun barrels.

Barbara Grant is another matter. She "received her Ph.D. in Organic Chemistry from Stanford University and has authored several dozen publications and patents in the field of novel organic and polymer materials." ³ She is president and chief executive officer of Siros Technologies, a company with headquarters in San Jose, CA, and involved in the development of laser systems for telecommunications.

Dr. Grant chaired a workshop devoted to analysis of the Waco FLIR at the April 2001 SPIE (International Society of Optical Engineering) conference in Orlando, FL. ⁴ Hardy and Zegel presented at the workshop as well as others. The presentations covered the following topics:

Waco investigation: image analysis of FLIR videotapes

Assessment of Waco, Texas, FLIR videotape

Studies of small arms signatures using comparable equipment to the Waco FLIR

Muzzle flash issues related to the Waco FLIR analysis

However, Dr. Grant declined to be identified as one of McNulty's consultants. In an e-mail she referred me to the technical publications.

A quick look for Fred Zegel on the Internet only showed up his association with the FLIR controversy and I was not able to find any technical publications by him. Various news sources cite him as a leading expert in FLIR image analysis, formerly with the Night Vision Laboratory at Fort Belvoir in Virginia. Apparently he was initially skeptical of the gunfire theory of the Waco FLIR flashes, but a few sessions with former colleague Edward Allard convinced him of the theory's merits. Dr. Allard was the retired Deputy Director of the Night Vision Laboratory and holds patents related to FLIR technology. ⁵

At this point let's review some juicy tidbits for the conspiracy buffs out there: Zegel came down with severe blood poisoning from an insect bite and as a result was unable to attend the tests at Fort Hood. Subsequently, Allard was felled by a stroke, and about the same time FLIR expert Carlos Ghigliotti died of a heart attack. The Web sites critical of the

government's role point this out unfailingly.

Despite McNulty's having forwarded my note to Zegel I never received any correspondence from him. My own e-mail to Zegel has gone unanswered. Apparently nobody is interested in personally committing to the points raised in the January phone conversation.

One of the recommended readings was the report by Vector Data Systems. The company was hired to analyze the Waco FLIR and to conduct the follow up test. Their report is very comprehensive and carefully correlates a number of flashes in the Waco FLIR with known sources. In one example the report points out a glass shard where a BATF agent broke an upstairs window of the compound on the first day. The glass lay on the roof for those 51 days and registered as a flash in the FLIR on the final day. It now would seem to be far fetched to claim, as McNulty and some others still do, that debris on that last day could not have produced flashes in the FLIR imagery. ⁶

McNulty also suggested I review Senator Danforth's final report, so I did and came away with this interesting excerpt. The FBI had placed listening devices about the building, and on the final morning they recorded the voices of cult members planning the destruction of the compound as they poured flammable liquid around. Investigators reviewed their recordings later and correlated events from the audio with other sources of information, including the FLIR and observations by agents at the scene. Furthermore, government agents observed activity inside the compound that was consistent with the intentions expressed in the audio, and the FLIR video shows multiple ignition points about the time of the last recorded voices from the bugs. The report continues:

As the fire began to spread, FBI agents heard gunfire within the complex. They stated that some of the rounds sounded "cooked off" by the heat, but that others were rhythmic in nature, leading some of the agents to conclude at the time that the Davidians were committing mass suicide.

Shortly after the fire began in the southeast corner of the complex, Davidians David Thibodeau, Derek Lovelock, Jamie Castillo, and Clive Doyle exited the chapel. Doyle had injuries on both sides of his hands consistent with liquid fuel burns. Graeme Craddock exited the chapel area through a window, entered the rear courtyard, and concealed himself in a concrete structure at the base of the water tower. He was not arrested until 3:30 p.m. At approximately 12:10 p.m., Davidian Renos Avraam exited to the roof. HRT agents attempted to help him to safety, although he resisted. Similarly, Davidian Ruth Riddle jumped from the white side roof but then reentered the complex. Special Agent James McGee exited his secure position in a Bradley, ran into the flaming building, and rescued Riddle against her will. Once Riddle was safely outside of the complex, McGee questioned her regarding the location of the children within the complex, but Riddle refused to answer. Marjorie Thomas and Misty Ferguson, who fell or jumped from the second floor on the white side of the complex, were badly burned. According to one of the Secret Service paramedics who treated her, Marjorie Thomas was in respiratory arrest and would have died had she not received the immediate medical care provided to her. During the course of the fire, a total of nine Davidians exited the complex. These Davidians were initially treated in the fortified medical position near the "T" intersection and then, transported to the rear medical area field hospital. The severely burned victims were flown by MedEvac helicopter to Parkland Hospital in Dallas, Texas. ⁷

I cannot reconcile this testimony with McNulty's contention that government agents fired at Davidians in order to keep them trapped inside the burning building. There is furthermore the testimony by the agents themselves that they did not. McNulty does not go so far in his statements to say the agents are lying. He will not, because he then might have to repeat those accusations in court. And that he cannot do.

Finally, it's hard for anybody to take a dispassionate stance on this issue. In fact, very few sources I have researched in this connection do so. In particular, there seems to be a large body bent on using this case to vent their own anti-government hostility. In the light of recent events I hear echoes of al-Qaeda and the Taliban in some of these diatribes.

References

1 Mike McNulty, e-mail on 24 January 2002.

2 David T. Hardy's Web site is at <http://www.hardylaw.net/>.

3 <http://www.sirostech.com/about/DBG.html>

4 <http://www.spie.org/conferences/programs/01/or/conf/4370.html>

5 <http://www.indirect.com/www/dhardy/allard.html>

6 <http://osc-waco.org/VDS/vds.pdf>

7 <http://www.gospelcom.net/apologeticsindex/pdf/finalreport.pdf>

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Actualism vs. Dr. Plaisted's Inadequate Uniformitarianism ¹

By Dr. Kevin R. Henke

The following material may be freely copied and distributed as long as it's not altered, edited or sold. [We have added hypertext links at the end of this document. Ed.]

At his website A Reply to Dr Henke and Others,² creationist Dr. David Plaisted states the following about catastrophes and "uniformitarianism":

"I also comment on the article Breakthrough Made in Dating of the Geological Record ³ at the same site. This article shows an agreement between argon-argon dating and astronomical time scales which is used to calibrate sedimentary deposits. This is very interesting, but the assumption is that the precession of the earth's axis has been constant for many thousands of years. If there were a recent global catastrophe, this precession might have been severely altered, invalidating this calibration. In general, uniformitarian assumptions such as this were foreseen in the Bible:

'Knowing this first, that there shall come in the last days scoffers, walking after their own lusts, and saying, Where is the promise of his coming? for since the fathers fell asleep, all things continue as they were from the beginning of the creation. For this they are willingly ignorant of, that by the word of God the heavens were of old, and the earth standing out of the water and in the water; whereby the world that then was, being overflowed with water, perished.'

² Peter 3: 3-6.

And Dalrymple (1984, p. 104) even defines uniformity, following Hubbert (1967, p. 31), by -

(1) We assume that natural laws are invariant with time

(2) We exclude hypotheses of the violation of natural laws by Divine Providence, or other forms of supernaturalism.

However, the assumption of global catastrophes in the past calls such calibrations of dating methods into question."

In another essay *When the Earth Tipped*,⁴ Dr. Plaisted misinterprets a dubious newspaper article to suggest that the Earth's inclination was seriously disrupted by "Noah's Flood." In reality, the highly questionable article says nothing about "Noah's Flood."

In his essays, Dr. Plaisted fails to recognize that scientists do not need to assume that the Earth's precession has been constant over geologic time. To the contrary, Van Andel (1994, p. 243-244) discusses evidence for changes in the Earth's precession and obliquity cycles over at least the past 400 million years. Strahler (1999, p. 268-273) also discusses the Earth's precession and obliquity cycles during the past 500,000 years and how they may affect glaciations. The figures in Strahler (1999, p. 271) show that the cycles and how they affect Earth-Sun distances are not entirely regular over time. Nevertheless, the changes in these cycles, as discussed in Van Andel (1994) and Strahler (1999), are too insignificant to support any proposed radical transformations in the Earth's orbital and rotational mechanics from "Noah's Flood" or similar tabloid claims in newspaper articles.

Modern uniformitarianism (actualism) states that the geologic record is the product of both NATURAL catastrophes (like local floods, landslides, earthquakes, meteorite impacts, and hurricanes) and slow and gradual processes (such as lakes drying up over long periods of time and precipitating salt deposits). Some of these catastrophes, such as the Cretaceous-Tertiary Yucatan meteorite impact, may have had worldwide effects. Actualism also recognizes that NATURAL conditions (such as climates) and processes (such as the spreading rates of tectonic plates or volcanic and earthquake activity) may quickly or slowly change at any time. That is, the rates of natural processes need not be constant over time. However, because magic is untestable, actualism does not invoke the supernatural to explain the geologic record. Indeed, actualism can easily explain the record without relying on ex nihilo creation miracles or any miracles associated with "Noah's Flood."

Dr. Plaisted's partial quotation of Dalrymple (1984) may create a misleading view that Dalrymple and Hubbert (1967), which Dalrymple quotes, reject all forms of catastrophes and are strict Lyell uniformitarians. However, this is not the case. When Dalrymple (1984, p. 104, 106) is viewed in its proper context, it's obvious that both Dalrymple (1984) and Hubbert (1967) fully accept actualism:

History, human or geological, represents our hypothesis, couched in terms of past events, devised to explain our present-day observations. What are our assumptions in such a procedure? Fundamentally, they are two:

- (1) We assume that natural laws are invariant with time
- (2) We exclude hypotheses of the violation of natural laws by Divine Providence, or other forms of supernaturalism

...[reference omitted]

The principle of uniformity, if it has ANY meaning at all in modern science, includes no more than these two principles. Indeed, most modern scholars of the subject have concluded that uniformitarianism today is simply the application of the scientific method to nature and that the term is so confusing it should be abandoned ...[reference omitted]. Thus, in assuming and then condemning constant rates for geologic processes, Morris and Parker ...[reference omitted] and their colleagues have set up a straw man based on obsolete historical definition of uniformity that no modern geologist would accept." [my emphasis]

Again, under actualism, the rates of natural processes can be highly variable and even catastrophic WITHOUT resorting to creationist magic. In other words, one sandstone may have originated from the gradual accumulation of sand in shallow seawater, but another similar sandstone may have resulted from the overnight deposition of sand in shallow water from an ancient hurricane. Careful studies may or may not be able to distinguish the radically different depositional processes of the two sandstones.

Natural catastrophes and gradual processes can easily occur without changing the fundamental laws of chemistry and physics. Yet, without invoking unproven miracles, using poorly argued newspaper articles, relying on "Flood models" that conflict with the chemical and physical properties of the Earth's crust or entirely sterilizing the Earth with planetary collisions, how does Dr. Plaisted propose that any radical changes in the Earth's orbit, rotation and/or declination could

occur during a year-long "Genesis Flood"? How could the Earth have stabilized from such a super catastrophe in only 4,000 years?

Finally, Dr. Plaisted's quotation of 2 Peter is irrelevant. Many creationists cite 2 Peter 3:3-6 to attack both the strawperson arguments of outdated Lyell uniformitarianism (e.g., Morris and Parker, 1982; Morris, 1978, p. 77-78, 93) and modern science's opposition to the young-Earth creationist (YEC) idea that miracles should be included in "science" so that YEC mythological interpretations of Genesis can be salvaged.

While YECs tend to trust 2 Peter and every other book in their Bibles, many theologians consider 2 Peter to be a forgery (for example, see *The Authenticity of the Second Epistle of Peter*).⁵ By the early 2nd century AD, critics of Christianity were challenging the false prophecies of Christ's "soon" second coming (e.g., Revelation 1:3). 2 Peter is probably a shallow attempt by a 2nd century AD Christian(s) to counter this justified criticism. Since then, fundamentalist Christians continue to claim that the "second coming" is at hand, critics periodically call their bluff, and fundamentalists still inadequately respond to this criticism by quoting 2 Peter. It hardly seems appropriate for anyone to cite such a dubious book to attack warranted skepticism of the claims of conservative Christianity or the efforts of geologists to understand the Earth's past.

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1 http://home.austarnet.com.au/stear/plaisted_actualism_henke.htm

2 <http://www.cs.unc.edu/~plaisted/ce/henke.html>

3 http://www.agu.org/sci_soc/eos96336.html

4 <http://www.cs.unc.edu/~plaisted/ce/tip.html>

5 <http://www.tyndale.cam.ac.uk/Scriptures/www.innvista.com/scriptures/compare/secpeter.htm>

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NTS elections

On January 12th of this year the members of NTS met and elected a new board of directors. The board then elected our new officers and staff. The results of those elections were:

NTS Officers

Curtis Severns, President

Daniel Barnett, Vice President

John Blanton, Secretary

Mark Meyer, Treasurer

NTS Staff

Keith Blanton, Newsletter Editor
Mike Selby, Webmaster
Daniel Barnett, Meeting Coordinator

NTS Board of Directors

Greg Aicklen
Laura Ainsworth
Daniel Barnett
Virginia Barnett
John Blanton
Prasad Golla
Steven Graf
Elizabeth Hittson
Mike Selby
Curtis Severns

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What's new

by **Robert Park**

[Robert Park publishes the What's New column at <http://www.aps.org/WN/>. Following are some clippings of interest.]

DOE voodoo: Inspector General uncovers more high-tech dowsing.

The DOE Office of Environmental Management supports development of innovative environmental cleanup technologies. It would be hard to imagine anything more innovative than "Passive Magnetic Resonance Anomaly Mapping," which combines an electronic system and a human operator into a single bio-sensory unit by connecting the operator at the wrists to an electronic system strapped to his waist. The device is supposed to locate underground water, faults, fractures, buried objects and chemicals. Specifics on the interaction between the operator and the electronics are, of course, proprietary. However, it relies on the operator's ability to sense tiny changes in magnetic fields. You've been having trouble sensing magnetic fields? Not to worry. The operator, a Ukrainian, is said to be the only person in the world who can. According to the DOE Inspector General's report, no peer review was sought before spending \$408,750 on field tests. You will be shocked to learn that it failed every test. The company that developed it blamed calibration problems. We are reminded that DOE also bought into the DKL LifeGuard. It was supposed to detect a human heartbeat through 500 ft. of concrete and steel (WN 25 Sep 98). Before that, DOE fell for the Quadro Tracker, a dowsing rod with lights and buttons (WN 12 Jan 96).

Prayer: Does belief influence what the researcher reports?

As WN reported last month, Mayo Clinic researchers could find no benefit to coronary patients from prayers if the patients didn't know they were being prayed for. This week, writing in Time.com, Leon Jaroff points out that, by contrast, Elizabeth Targ, who is funded by the National Center for Complementary and Alternative Medicine, found a positive distance healing effect on AIDS and cancer patients. Jaroff says such work should be monitored by qualified scientists from outside the paranormal and quack communities. "Past experience," he writes, "suggests that under such safeguards miracles do not occur."

Acupuncture: Surprise, it doesn't help cocaine addiction.

I keep trying to imagine why anybody ever thought it could, but treating dependency by inserting needles in the subject's ear is a widely used treatment. ("I'll quit! Just don't stick more of those damned needles in my ear.") But now, in perhaps the largest study of any acupuncture therapy, researchers at Columbia found it to be totally ineffective. Practitioners did not dispute the findings, according to an article in the New York Times, but said acupuncture is usually used in combination with other treatments. ("Dexaslim, when combined with a program of diet and exercise, is guaranteed to take off the pounds.") It's a reminder that, before scientists take far-out claims seriously, they should insist that a plausible explanation based on known science be advanced.

Freedom car: Has Spencer Abraham discovered a hydrogen well?

Parking garages near the North American International Auto Show in Detroit were crammed with monster SUVs last week. The owners were there to hear the Secretary of Energy describe "the best way to protect the environment and reduce the nation's reliance on foreign oil." He announced the "freedom car" program, meant to stimulate development of hydrogen fuel-cell vehicles. The big- three auto makers were quick to pledge their support. After all, a decade is needed to perfect the technology, during which time they can forget about CAF standards (WN 27 Jul 01), even as SUVs grow to the size of cement trucks. Meanwhile, story after story in the media gushed that hydrogen fuel cells are environmentally benign, producing only water as a by-product. Almost none asked where the hydrogen would come from. You may recall the Hydrogen Future Act of 1995, introduced by Bob Walker (R-PA). It called hydrogen "a new energy source." It's great fuel, but it's not a source. The bill died after it was pointed out that the hydrogen would come from electrolysis of water (WN 31 Mar 95). About 65% of U.S. electric power is generated by burning fossil fuels. The cell will supply less energy than it took to make the hydrogen.

Got carbon? Does "freedom car" mark a shift in energy policy?

Last year the Western Fuels Association held a press conference in Washington to explain the benefits of increasing levels of CO₂ in the atmosphere. "It's food," the WFA Director crowed. Warm food at that: 2001 was the second warmest year on record, just behind 1998, according to the annual review issued by NOAA's National Climatic Data Center this week. (At the same time, another report notes that in Western Antarctica the ice sheet is actually growing thicker, slightly countering the overall trend.) But perhaps the "freedom car" signals a program of increased reliance on nuclear and renewable energy production. Yeah, sure.

Bob Park can be reached via email at opa@aps.org

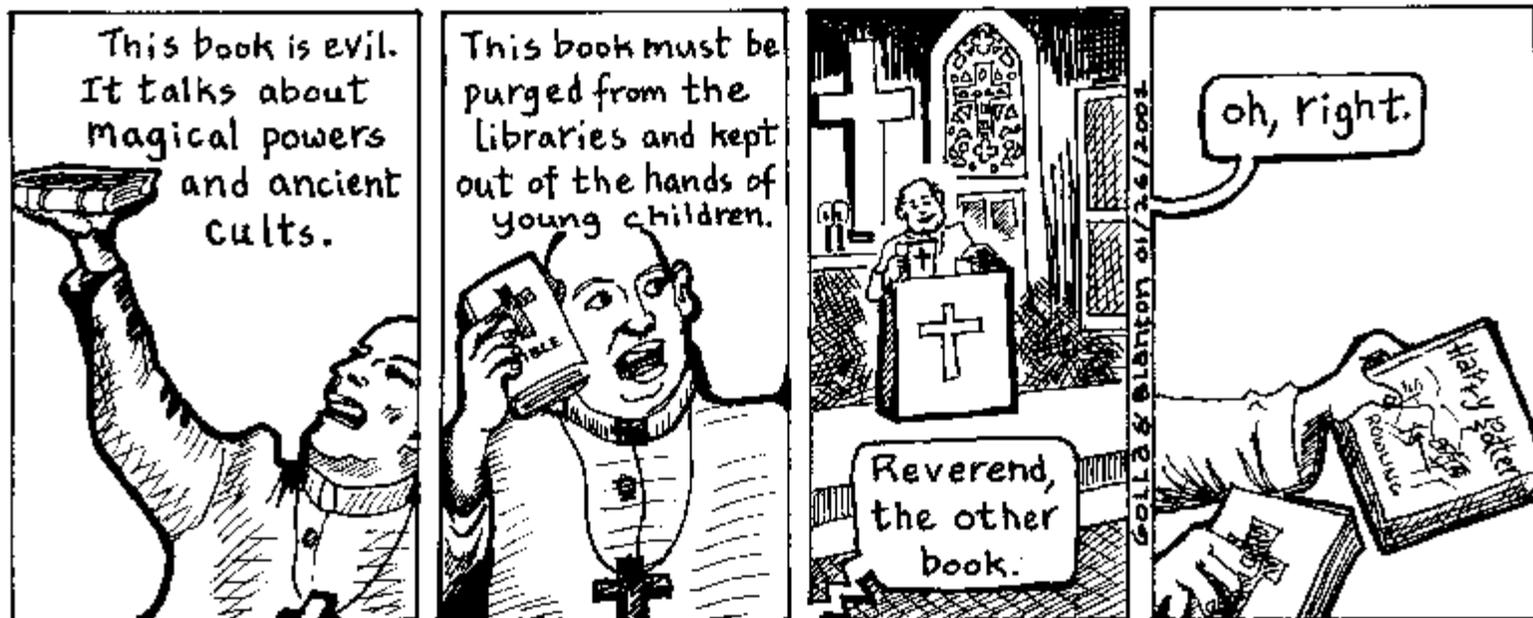
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By Prasad Golla and John Blanton

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