“Hand Waving” the Physics of 9/11

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Ph.D. in Physics, Brown University, 1966. Fellow, American Physical Society. Research physicist at Naval Research Laboratory (NRL), Washington, DC, 1967-2001. Officially credited with largest number of papers (5) by any author on list of 100 most cited articles authored at NRL between 1973 and 1988. 185 total articles now in print. Fulbright-García Robles Fellow at Universidad Nacional Autónoma de México 1997. Invited Professor 2000-2004: Universités de Paris-6&7, Lyon-1, et St-Etienne (France) and Tokyo Institute of Technology. Adjunct Professor of Materials Science & Engineering, University of Arizona 2004-2005.

Manuel Garcia, who has his Ph.D. in Aerospace and Mechanical Engineering from Princeton and works as a physicist at Lawrence Livermore National Laboratory has written a recent series of articles for CounterPunch, which is described by the editors as a “widely applauded primer on the laws of physics and the myths of conspiracists (sic)” concerning the collapses of World Trade Center towers 1, 2, and 7.

Below, I will take issue with Dr. Garcia’s primer. He doesn’t get MY applause.

I too hold a Ph.D. (in Physics) from an Ivy League university (Brown) and have worked as a physicist at a national laboratory (33 years at the Naval Research Laboratory in Washington, DC).

Physicists with international reputations hate to be caught making mistakes. Even Albert Einstein was chagrined by what he regarded as his “biggest blunder,” that is, adding a “cosmological constant” to his general theory of relativity in order to stabilize the universe against gravitational collapse. Einstein threw in the towel after the astronomers determined that the more distant galaxies have greater “red shifts,” thus proving that the universe is actually expanding. Only after his death was it found out from studies of the cosmic microwave background radiation that, “yes, Virginia,” there really is a cosmological constant!

But there was only one Einstein. The rest of us have little hope that history will look kindly on our blunders.

Mercifully, we normally publish in refereed journals, where some of our inevitable mistakes are caught by anonymous peer reviewers prior to publication. Nevertheless, referees tend to be too busy to catch every error, so mistakes can still leak into print. I have made a horrendous number of mistakes in the process of publishing the 108 papers that I wrote fully myself. I know this because I’ve caught virtually all of them myself by double-, triple-, and quadruple-checking my data, logic, and mathematics before allowing

my manuscripts to go to press. My published works are highly respected by my peers according to my score (h=39) on the recently devised Hirsch index [J.E. Hirsch, Proc. Nat. Acad. Sci. 0507655102 (2005)]. This means that 39 of the 185 total papers of which I am the principal author or a coauthor have each been cited at least 39 times in other refereed publications.

By contrast, informal publications on the internet are not subject to such checks and balances, and no one's reputation is likely to be badly tarnished if mistakes are made here. So even scientists may be tempted to "shoot from the hip" in a blog. This situation reminds me of my undergraduate and grad-school days when everyone made mistakes – harmlessly.

There were times when a physics professor would forget important steps in deriving a theorem on the blackboard and get away with not admitting it. Thanks to one of my physics instructors with a sense of humor, I learned a term for a credentialed person's bamboozling of the uninitiated. It's called "proof by intimidation."

There is another amusing term that is almost universally used by physicists. Picture a graduate student eager to explain to his mentor a hypothesis he has just hatched to explain some odd data. Almost immediately he experiences difficulty finding the "right" words (generally because his hypothesis is half baked or flat wrong) and so begins to substitute gesticulations. Thus, physicists have come to refer to simplistic use of words in lame attempts to explain complex physical phenomena as "hand waving."

Part One of Dr. Garcia's three-part series in CounterPunch is entitled "We See Conspiracies That Don't Exist – The Physics of 9/11" (http://www.counterpunch.org/physic11282006.html). He begins with a short history of the mass psychoses of the past half century and shows by example how many of these have resulted from people's ignorance of science. He further asserts that such ignorance often causes people to construct myths that help to soothe their fears of forces beyond their control – and that many such myths take the form of "conspiracy theories."

Deeper into his introductory paragraphs, Dr. Garcia introduces the reader to the concept of "Occam's Razor" in these words: "Experience has shown that if the evidence allows for several explanations to a given problem then the hypothesis with the fewest assumptions is most probably correct." However, Dr. Garcia grossly overrates Occam's Razor in the matter of what experience actually shows. In my 40 years of doing experimental physics I found that the phenomena I studied in the greatest depth usually turned out to be vastly more complex than my initial hypotheses anticipated. Indeed, the one time I can remember actually using Occam's Razor to justify a hypothesis in a published paper, I lived to see it disproved 19 years later by a research group in Palermo, Italy.

Score: Physics 1, William of Occam 0.

What I love about doing physics of the material world is that the correct explanation of each and every physical phenomenon eventually emerges, even if it takes many years. Physicists worldwide read each other's work, gather more and more evidence, and commonly falsify one another's earlier hypotheses in the process of getting to the core truth.

But leaving behind the physical world for the world human conniving, all bets are off.

Human conspirators may well choose to deliberately violate Occam's Razor simply to throw off forensic investigators sophisticated enough to be aware of the concept. In fact, I will give an example of this in the talk "Forensic Statistical Mechanics Applied to Public Documents Prove Poll-Worker Fraud" that I am scheduled to present in the symposium "Are We a Democracy? Vote Counting in the United States," at the 2007 Annual Meeting of the American Association for the Advancement of Science.

Dr. Garcia next describes the multi-volume Final Report by the National Institute of Science and Technology (NIST), issued in September 2005, as the "official word" on the events of 9/11, particularly regarding the collapse the World Trade Center (WTC) towers. He tells us that NIST "did not proceed to a detailed simulation of the collapses to the ground" and that "NIST justified this on the grounds that there was sufficient energy in the descending blocks to crush the lower structures, once failures had occurred."

In my opinion, this so-called "justification" on the part of NIST is "hand waving" in its purest form – and in the most unforgivable of circumstances! Americans have a right to know exactly what happened on 9/11, and this right justifies a major effort to simulate every second of the collapses by means of super computers and perhaps mechanical scale models. For $20 million taxpayer dollars, NIST should already have delivered such. That they did not is inexcusable.

But I diverge.

Let's return to Dr. Garcia's physics tutorial. In the section called "Problem 1 Force Balance" he considers the force due to the "upper block" of a WTC tower (defined as the part of the building above where the airplane struck) pushing downward on the rest of the building. He uses Newton's 2nd Law of motion (F = ma, where "F" is force, "m" is mass, and "a" is acceleration) to set up equations for the dynamic force that would be imparted to the lower part of the building in the event that all vertical support members between two of the floors (nominally at the airplane-strike level) should instantaneously lose all of their strength. He concludes this section with a tautology: "Clearly, the lower structure will crumble when F is greater than the maximum force it can support..."

Clearly. But what IS the maximum force the lower structure can support? Dr. Garcia never tells us, and I suspect he doesn't know. This is a classic prelude to a "proof by intimidation."

Then we arrive at “Problem 1, Numerical Example of Progressive Collapse,” where Dr. Garcia sets up equations for free-fall times and speeds as functions of drop distance without air resistance. Specifically, he calculates the free-fall speed of the “upper block” dropping 3 meters (the approximate height between floors in a WTC tower) assuming no air resistance – AND assuming absolutely zero resistance by the 47 massive central steel columns or the approximately 200 intact exterior support members. Possible fire weakening notwithstanding, this final assumption is totally unjustified, and I shall have more to say about it below.

But first let’s see where his calculation leads.

He calculates the total (static plus dynamic) force exerted by the “upper block” upon striking the lower structure after this 3-meter free-fall as being 6.1 times the weight of the upper block. The number “6.1,” as given, has two significant figures (the 6 and the 1), normally implying that any error in this calculation should be no larger in magnitude than plus-or-minus 0.9. So is the number 6.1 really so accurate? Well, it’s accurate if you accept Dr. Garcia’s OTHER assumptions to be accurate.

What other assumptions?

Well, he supposes a value for the change in speed (dv) that the “upper block” experiences when it hits the floor below it – and also a value for the time interval (dt) during which this speed is lost. A couple paragraphs before his actual calculation, Dr. Garcia asserts without proof or argument that “Impact is a very brief process whose duration is dt = 1/100 [second].”

Whoa, Nellie! It turns out that the value of dt = 1/100 second is critical to his thesis, but he doesn’t tell us where it came from!

So how accurate is this number anyway?

Well, to have such a small value of dt would require that the bottom of the falling “upper block” meet the floor below without the slightest tilt. For example, accepting Dr. Garcia’s free-fall speed calculation of 7.7 meters/second, tilting of a 63.4-meters-square WTC floor by mere 1 degree would increase dt from his guesstimate of dt = 0.01 second all the way to dt = 0.14 second, giving the instantaneous total force of the falling “upper block” on the lower structure of just 1.3 times the static weight of the “upper block” instead of the 6.1 times as estimated in his “example.”

So did the “upper blocks” of WTC1&2 fall without tilting?

Well, according to NIST’s final report (Section 6.14.4, p. 146): “Failure of the south wall in WTC 1 and east wall in WTC2 caused the portion of the building above to tilt in the direction of the failed wall.” And in films, the "upper block" of WTC2 is seen to tilt as much as 23 degrees!

Therefore, if we accept NIST's last word on the subject, Dr. Garcia's guesstimated dt parameter is egregiously wrong, and his calculations prove nothing – not even "by intimidation."

And yet the real elephant in the room still remains Dr. Garcia's tacit assumption that the intact core columns (most of the original 47) and the about 200 visibly intact perimeter columns between the two adjacent floors in question SIMULTANEOUSLY lost 100% of their strength at the precise moment of collapse initiation.

Why simultaneously?

Well, Dr. Garcia's dynamic-force calculation assumes the "upper block" to have been in unimpeded free-fall for the full 3 meter drop, whereas if some steel columns simply refused to bend or break at the same time, the "upper block" would have descended those 3 meters without picking up nearly as much speed.

In fact, Dr. Garcia's concealed assumption that all support columns lost ALL of their strength – from floor to ceiling – at a single instant in time (much shorter than the 0.78-second 3-meter free-fall time) is unsupported by any evidence, or even by any claim made by NIST.

Moreover, even neglecting the different strengths of steel at different temperatures, it is astronomically improbable that approximately 250 steel columns would fail SIMULTANEOUSLY in a fire. In more popular language, this hidden assumption underlying Dr. Garcia's calculation is "statistically impossible."

But there is ONE way that all of the columns could have lost strength simultaneously. It's called CONTROLLED DEMOLITION.

David Ray Griffin has web-published a splendid, highly footnoted account of "The Destruction of the World Trade Center: Why the Official Account Cannot Be True": http://911review.com/articles/griffin/nyc1.html#multipleevidence
This scholarly work, rich in eyewitness accounts, includes 11 separate pieces of evidence that the World Trade Center towers 1, 2, and 7 were brought down by explosives.

Thus, with his hidden assumptions exposed, Dr. Garcia's analysis does NOT support the official hypothesis that fires initiated the collapse of the World Trade Center towers on 9/11/01 and does NOT contradict Dr. Griffin's compilation of evidence that they were brought down by controlled demolition.

I have a feeling that most physicists never completely outgrow their propensity for "hand waving" and that in moments of hubris some may even resort to "proofs by intimidation." But in the end what keeps us honest is our need to publish in peer-reviewed journals.

Therefore, I implore my fellow physicists and engineers who may have the time, expertise, and (ideally) supercomputer access to get to work on the physics of the

World Trade Center collapses and publish their findings in refereed journals like, say, the Journal of Applied Physics.

The issue of knowing who was REALLY behind the 9/11 attacks is of paramount importance to the future of our country, because the so-far-UNPROVED assumption that it was the work of 19 Arab amateurs has led directly to the Patriot Act, the Iraq war, NSA spying on ordinary Americans, repudiation of the Geneva Conventions, and the repeal of habeas corpus (a fundamental point of law that has been with us since the signing of the Magna Carta in 1215).

Surely there can be no higher motivation than this for any patriotic American physicist or engineer to enter the search for 9/11 Truth!

NB: Further comment on the paper above by Prof. Griscom can be found here: "Scientists Clash over 9/11 Collapses," by Paul Conant, http://911science.blogspot.com/ .

Excerpts from that article:

"Griscom, who has some 185 professional papers to his credit, is urging fellow physicists to look diligently into the circumstances of the 9/11 attacks. "I implore my fellow physicists and engineers who may have the time, expertise and -- ideally -- super-computer access to get to work on the TRUE physics of the World Trade Center collapses and publish their findings in refereed journals like Physical Review and the Journal of Applied Physics.""

"The Garcia controversy follows the uproar caused by Steven E. Jones, who, as a Brigham Young University physics professor, published a widely read internet paper favoring controlled demolition of the towers. Jones was eventually pressured to retire."

"The NIST favors the idea that fires superheated core columns and structural supports sufficiently to initiate collapse and says that it found no evidence that explosives shortened the core columns. One physicist, who asked to remain anonymous, argues that the massive explosions that immediately preceded the collapses cannot be shrugged off… The scientist also challenges the NIST assumption, defended by Garcia, that the fires could have critically weakened the steel, questioning the plausibility of the NIST claim that office furnishings and supplies could have added enough heat to initiate catastrophic collapse."

"Among scientists on record as questioning the government's 9/11 claims are Frank Legge, PhD; John P. Costella, PhD; Derrick P. Grimmer, PhD; Bill Hammel, PhD; Gregory S. Jenkins, PhD; and Joanna M. Rankin, PhD.

"Rankin, a professor of astronomy and physics at the University of Vermont, reportedly

helped organize a petition drive to push Vermont's Washington delegation to call for the reopening of the 9/11 investigation."

"A well-known mathematician who is a vocal critic of the official 9/11 accounts is the Canadian A.K. Dewdney, who found that extended cell phone use on Flight 93 high over Pennsylvania seemed unlikely. His site is http://www.physics911.net/

"Other critics are Robert S. Boyer, professor of mathematical philosophy [logic] and computer science at the University of Texas, and Joseph Phelps, charter member of the Structural Engineering Institute at the American Society of Civil Engineers.

"Two former structural engineering professors believe WTC7 was downed with explosives, according to Daniele Ganser, a University of Zurich historian. She quotes Hugo Bachman and Jorg Schneider, both recently retired from Zurich's Federal Institute of Technology, as being of the opinion the building was professionally demolished.

"Two others opposing the official scenarios are Peter Phillips, a sociology professor and director of Project Censored at Sonoma State University, and Charles Simpson, chairman of the department of Sociology at the State University of New York at Plattsburgh. Simpson is an organizer of the Burlington 9/11 ballot question. Dennis Loo, Phd, a sociology professor whose work for Project Censored focused on 2004 election irregularities, has also expressed doubts about the official 9/11 account."