

Sources related to exceptionally high temperatures, and/or to persistent heat at Ground Zero

Disinformation regarding the phenomena of “molten steel”/ exceptionally high temperatures/ persistent heat at Ground Zero; Pre-collapse pressure pulses

A. Dreger

Overview

The official account of 9-11 does not give a sound explanation of where any extremely hot material in the WTC collapse piles could have come from, nor does it give a sound explanation for the unusually persistent heat at Ground Zero. Numerous misleading and misinforming statements are disseminated to conceal this dilemma of the official account.

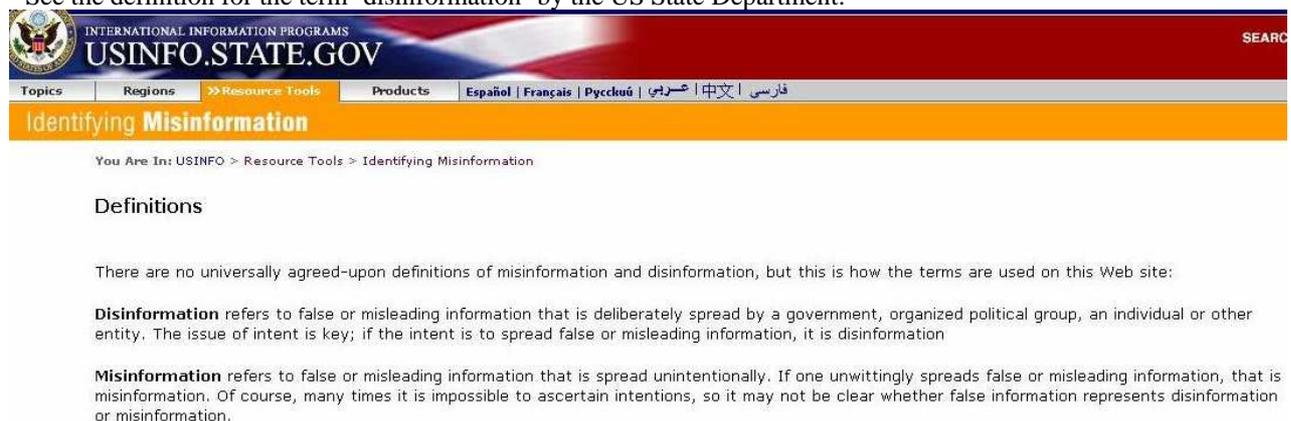
In Part I several sources are compiled relating to the exceptionally high temperatures, and/or to the persistent heat at Ground Zero. Most of these sources compiled have a background in science or in engineering. Some sources are statements by people who participated in the management of Ground Zero. The background of some of the sources is given in detail. In the subsection “Thermal images” some features of published thermal images are addressed. Some of them are in conflict with the assumption that the high temperatures/persistent heat phenomenon was due solely to burning fires

In Part II disinformation strategies, techniques and arguments are addressed that serve the purpose of avoiding a thorough public debate about the phenomena of “molten steel”, exceptionally high temperatures and persistent heat at Ground Zero. The articles and excerpts discussed are from NIST, from so-called “debunking” websites, and from mainstream mass media.

It will be shown that the statements and suggestions by NIST and “debunkers” in respect of these phenomena are misleading or wrong. In some of the cases the wrong or misleading statements or suggestions are directly stated. In these cases it will be shown why a statement or suggestion is wrong or misleading, and indications will be discussed that the authors must have been aware of the fact that their statements or suggestions are wrong or misleading. These statements or suggestions have the quality of disinformation¹. With respect to the other cases it will be shown that misleading suggestions are spread by the use of language that is purposely manipulative.

In addition to the articles and excerpts that are directly related to the high temperature/persistent heat phenomena at Ground Zero some mass media articles are discussed that deal with these phenomena implicitly by dealing with the broader subject “9-11

¹ See the definition for the term ‘disinformation’ by the US State Department:



The screenshot shows the header of the USINFO.STATE.GOV website. It includes the US State Department logo, the text 'INTERNATIONAL INFORMATION PROGRAMS USINFO.STATE.GOV', and a search bar. Below the header is a navigation menu with 'Topics', 'Regions', 'Resource Tools', and 'Products'. The main content area is titled 'Identifying Misinformation' and contains the following text:

You Are In: USINFO > Resource Tools > Identifying Misinformation

Definitions

There are no universally agreed-upon definitions of misinformation and disinformation, but this is how the terms are used on this Web site:

Disinformation refers to false or misleading information that is deliberately spread by a government, organized political group, an individual or other entity. The issue of intent is key; if the intent is to spread false or misleading information, it is disinformation

Misinformation refers to false or misleading information that is spread unintentionally. If one unwittingly spreads false or misleading information, that is misinformation. Of course, many times it is impossible to ascertain intentions, so it may not be clear whether false information represents disinformation or misinformation.

conspiracy theories”. It will be shown that these articles have the quality of disinformation as well.

In addition it will be shown that the handling of the discussion about 9-11, as it can be found in well known mass media, constitutes a distortion of the established understanding of what is science.

Finally, the implications are discussed of the facts that the U.S. government agency NIST, Associated Press, well known mainstream media and others distribute disinformation, and that the U.S. State Department recommends and provides links to disinformation articles.

In the Appendix P/Pressure Pulses, some excerpts from the *“final report on the National Institute of Standards and Technology (NIST) investigation of the collapse of the World Trade Center (WTC) towers”* regarding the following pre collapse events are compiled:

- *“Pressure pulses”* (e.g. *“pressure pulses affecting multiple floors and faces”*, *“pressure pulses”* that are *“moving” “across a building face”*, *“pressure pulses that were large enough to force smoke and fire from open windows on multiple faces and stories”*, inter alia, *“at 10.18.48 and ... just seconds prior to the collapse of the [North] Tower at 10:28:22 am.”*)
- Various kinds of *“unusual fire behaviour”*
- *“Seven periods” “typically about a minute, during which heavy smoke would suddenly start to flow from open windows over large areas of the face that had been essentially free of smoke”*. At the end of those periods of *“simultaneously” “heavy smoke flow (and external flaming) from numerous windows on 79th and 80th floors of the East face of WTC 2” “the smoke flow would subside as quickly as it started”*. *“The lengths of” those “periods were remarkably consistent”*.

The appendix was compiled to discuss one statement from the NIST fact sheet. However, these pre-collapse events seem interesting in themselves.

Quotes are given in italics or as screen shots.

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It should be possible to read a single section in Part (II) independently (it should be possible to start, for example, with the section “Disinformation in mass media”). However, the discussion of the statement in NIST’s fact sheet is based on the result of the discussion in the metallurgy part, and “Rewriting science” is connected to the mass media section.

When in the following the term “molten steel” is used (written in quotation marks) it refers to the term as used in the sources. The use of this term makes no statement about which substances were observed. However, it is acknowledged that the substances referred to as “molten steel” in the sources were in all probability substances with an appearance that resembled molten steel.

This article may contain copyrighted material the use of which has not been specifically authorized by the copyright owner. The material is quoted here to advance understanding of political issues. This constitutes a 'fair use' of copyrighted material as provided for in the US Copyright Law.

(I) Sources related to exceptionally high temperatures, and/or to persistent heat at Ground Zero

(A) Article by Bechtel engineers in the journal “Professional Safety JOURNAL OF THE AMERICAN SOCIETY OF SAFETY ENGINEERS”

Iron melts at about 2800°Fahrenheit. Therefore the following quote by Bechtel engineers (who worked as health and safety professionals at Ground Zero) supports the assumption that something with the appearance and at the temperature of “molten steel” was found at Ground Zero.

Quote²: “More Challenges

Soon after our arrival at Ground Zero, the SH&E team received a briefing from Port Authority SH&E personnel regarding hazardous materials and commodities stored in (and under) some WTC buildings. At this early stage, their status was unknown and, therefore, presumed to be a threat to personal safety. The most-serious concerns included:

[...]

WTC Building 6 housed several federal agencies, primarily U.S. Customs [...]. The third floor—now largely inaccessible—contained a firing range. More than 1.2 million rounds of ammunition were stored on this level, as was a vault used to store other explosives and weapons. [...] Final status: At great personal risk, Customs officials, the FBI and contractor representatives located and removed the criminal evidence from Building 6 during the fourth week of the effort. The ammunition was finally located on Oct. 24, 2001, melted together into large “bullet balls” that were extremely dangerous to handle and dispose of properly (Photo 12). [...]

The debris pile at Ground Zero was always tremendously hot. Thermal measurements taken by helicopter each day showed underground temperatures ranging from 400°F to more than 2,800°F. The surface was so hot that standing too long in one spot softened (and even melted) the soles of our safety shoes. Steel toes would often heat up and become intolerable. This heat was also a concern for the search-and-rescue dogs used at the site. Many were not outfitted with protective booties (Photo 13). More than one suffered serious injuries and at least three died while working at Ground Zero. The underground fire burned for exactly 100 days and was finally declared “extinguished” on Dec. 19, 2001.”

Background of the above, **quote**³: *“On Sept. 12, 2001, a small group of SH&E [Safety, Health and Environment] professionals from Bechtel Group Inc., led by Stewart Burkhammer, a professional member of ASSE’s National Capital Chapter [ASSE: AMERICAN SOCIETY OF SAFETY ENGINEERS], arrived in New York City to assist the city and state of New York in the emergency recovery effort after the terrorist attacks on the World Trade Center. The sights and experiences of the days and weeks that followed are described here in order to provide fellow SH&E professionals a brief account of the extraordinary challenges encountered at Ground Zero*

² Quoted from: “Disaster Response SH&E at Ground Zero A firsthand account from the most dangerous workplace in the U.S.” By Jeffrey W. Vincoli, Norman H. Black and Stewart C. Burkhammer in “Professional Safety JOURNAL OF THE AMERICAN SOCIETY OF SAFETY ENGINEERS”, May issue 2002, page 21-28; <http://www.asse.org/professionalsafety/archive.php> (or view as documentation at: http://911research.wtc7.net/cache/wtc/analysis/asse_groundzero1.htm).

³ Quoted from “Disaster Response ...”, see above.

Jeffrey W. Vincoli, CSP, CHCM, is ES&H manager for corporate assessments and audits with Bechtel Construction Operations Inc., Frederick, MD. He is a professional member of ASSE's Cape Canaveral Chapter and chairs the Society's PDC Planning Committee. He will discuss his Ground Zero experience on June 11, during a general session at ASSE's 2002 PDC in Nashville, TN.

Norman H. Black, CSP, is ES&H manager for special projects with Bechtel Systems and Infrastructure Inc., San Francisco. He is also licensed by the U.S. Coast Guard as a captain of 100-ton sailing and motor-driven vessels. Black is a professional member of ASSE's San Francisco and Puget Sound chapters.

Stewart C. Burkhammer, P.E., CSP, is principal vice president with Bechtel Group Inc., Frederick, MD. He has held several leadership positions with the organization, including manager of environmental, safety and health services. A Fellow of ASSE, Burkhammer is a professional member of the National Capital Chapter. He is also a member of OSHA's Advisory Committee on Construction Safety and Health.

Note that Building WTC 6 was hit by parts of WTC 1; see references for this below in (E).

(B) Publication by the U.S. Department of Labor

Quote⁴:



A Dangerous Worksite

[...]

“Identifying Risks and Hazards: [...]

HOT STEEL

Even as the steel cooled, there was concern that the girders had become so hot that they could crumble when lifted by overhead cranes. As a result, additional safeguards were put in place to limit the dangers associated with lifting the damaged steel and to protect the workers in the vicinity.

Another danger involved the high temperature of twisted steel pulled from the rubble. Underground fires burned at temperatures up to 2,000 degrees. As the huge cranes pulled steel beams from the pile, safety experts worried about the effects of the extreme heat on the crane rigging and the hazards of contact with the hot steel. And they were concerned that applying water to cool the steel could cause a steam explosion that would propel nearby objects with deadly force. Special expertise was needed. OSHA called in structural engineers from its national office to assess the situation. They recommended a special handling procedure, including the use of specialized rigging and instruments to reduce the hazards.”

⁴ Quoted from http://www.osha.gov/Publications/WTC/dangerous_worksite.html. This source was found at www.governmentterror.com.

(C) Article in the journal “Aerosol Science and Technology” by T. A. Cahill et al.

Quote⁵: *“The collapse of the World Trade Center (WTC) buildings #2 (South Tower), #1 (North Tower), and #7 on September 11, 2001 is an unprecedented event in numerous ways. Yet the prompt and massive emissions of smoke and dust in the first days after the collapse were in accord with common understanding of such phenomena. However, the continuing emission of these plumes, especially after the heavy rains of September 14 and the increasingly effective efforts of fire suppression in mid- and late September, are not fully understood. [...] Very high temperatures occurred in the burning floors of the buildings prior to collapse and during the first few days of active surface fires, as shown by the melting of metals. Later, infrared surveys showed surface temperatures in the collapse pile were as high as 30 K above ambient in October, and much higher subsurface temperatures were inferred from the lower portions of removed steel beams glowing red. The subsurface of the collapse piles remained hot for months despite use of massive amounts of water to cool them, with the last spontaneous surface fire occurring in mid-December.”*

The following statement is contained in a PowerPoint presentation that was given by Cahill et al. at the American Chemical Society Meeting 2003, **quote⁶:**
“The surface and near sub-surface debris pile was hot enough to melt aluminum, make steel red hot, and burned until Dec. 19.”

Background of the above: Thomas Cahill, is “a UC Davis professor emeritus of physics and atmospheric science and research professor in engineering.” T. Cahill is “an international authority on the constituents and transport of airborne particles”. “Cahill heads the UC Davis DELTA Group (for Detection and Evaluation of Long-range Transport of Aerosols), a collaborative association of scientists at several universities and national laboratories. The DELTA Group has made detailed studies of small airborne particles, called aerosols, from the trade-center collapse, 1991 Gulf War oil fires, volcanic eruptions and global dust storms, and has most recently finished a massive 21-site study of Asian aerosols for the National Science Foundation.”⁷

⁵ Quoted from: Cahill, Thomas A., Cliff, Steven S., Perry, Kevin D., Jimenez-Cruz, Michael, Bench, Graham, Grant, Patrick, Ueda, Dawn, Shackelford, James F., Dunlap, Michael, Meier, Michael, Kelly, Peter B., Riddle, Sarah, Selco, Jodye and Leifer, Robert , 'Analysis of Aerosols from the World Trade Center Collapse Site, New York, October 2 to October 30, 2001', *Aerosol Science and Technology*, 38:2, 165 – 183; pages 165f, URL: <http://dx.doi.org/10.1080/02786820490250836>)

See a longer continuous quote of this below, Part II. Note that the term “are not fully understood” is frequently used in science to express “the reason is unknown”.

⁶ Quoted from “Very fine aerosols from the World Trade Center collapse piles: Anaerobic Incineration?”, by Thomas A. Cahill, Steven S. Cliff, Kevin D. Perry (U. Utah) , James Shackelford, Michael Meier, Michael Dunlap, Graham Bench, (LLNL), and Robert Leifer (DOE EML); PowerPoint presentation at the American Chemical Society Meeting 2003, Presentation download [[WTC aerosols ACS 2003.ppt](http://delta.ucdavis.edu/WTC.htm); 7,500kb] at <http://delta.ucdavis.edu/WTC.htm>, slide 18. Analysis of Aerosols from the World Trade Center Collapse Site, New York, October 2 to October 30, 2001.

⁷ All quotes from the website <http://delta.ucdavis.edu/WTC.htm>, DELTA Group, Department of Applied Science, University of California, Davis, California.

(D) Quote and photograph by LiRo engineering, November 2001

Quote and photograph⁸:

Red Hot Debris. The removal of debris from the collapsed areas requires the safe lifting and maneuvering of very heavy steel beams, often twisted and tangled from the force of the collapse. Some beams pulled from the wreckage are still red hot more than 7 weeks after the attack, and it is suspected that temperatures beneath the debris pile are well in excess of 1,000°F. One group of beams fell end-first, embedding themselves deeply into the subway system below. The removal of these beams – one of which struck an electrical equipment room – is a delicate operation requiring close coordination with New York City Transit. Although the 1/9 station below the Trade Center is heavily damaged, 1,200ft. are intact. LiRo is working with New York City Transit to shore up the station so that there will be no further damage.

Key among LiRo's on-site engineering staff are structural engineers Dick Posthauer and Chuck Guardia, Jr., and civil engineer Mike Marsico, formerly with the Port Authority. Frank Franco, an architect with LiRo's construction management group, serves as LiRo's project manager, with Joe Pinto, a CPA, as financial manager.



Note that the photograph bears the date October 21 2001.

About LiRo, **quote** from their current website⁹: “*LiRo facts: Ranked among the nation's Top 100 Construction Managers (Engineering News-Record) A diverse, multi-disciplined A/E/CM firm of over 380 people [...] LiRo's design staff boasts over 65 licensed seasoned professional engineers in the specialized areas of civil, structural, environmental, mechanical, electrical and traffic engineering. [...] Our staff includes the region's largest pool of construction inspectors and CPM schedulers. LiRo's project control capabilities, experience and expertise are unmatched.*”

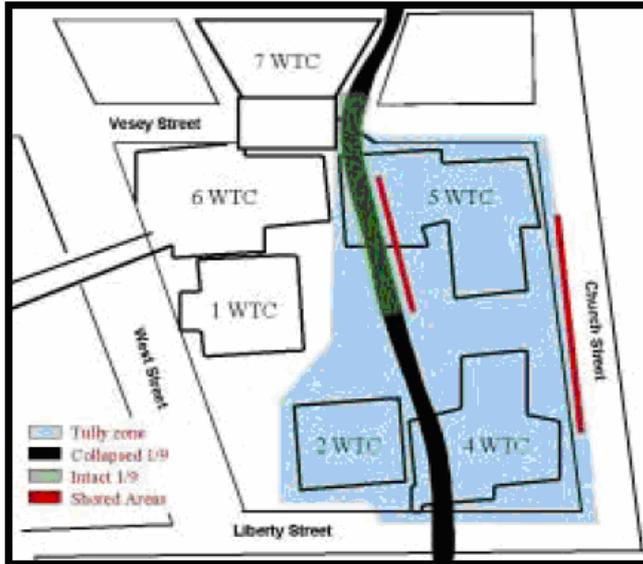
Background of the above, **quote** from the same article:

Work at the World Trade Center Involves the Firm's Top Personnel

New York's engineering and construction communities have been put to the test as a multitude of firms pour their resources into the recovery effort at ground zero. Nowhere has this been truer than at LiRo, where the firm's personnel have been involved since the week after the tragedy.

⁸ This source was found at www.governmentterror.com. The original source is not available anymore; governmentterror.com provides the link to <http://web.archive.org/web/20050520232345/http://www.liro.com/lironews.pdf>.

⁹ Quoted from <http://www.liro.com/history.html>.



The New York City Department of Design and Construction (DDC) has divided the site into four quadrants for recovery operations and debris removal. Tully Construction, a heavy construction contractor experienced in emergency contracts, has the largest quadrant, encompassing nearly half the site. Included in Tully's zone are the South Tower and World Trade Center Buildings Four and Five.

Having worked closely with LiRo on other City projects, Tully called upon the firm to provide demolition support, structural engineering, scheduling, accounting, and interface with the City's primary engineering consultants, LZA/Thornton & Thomasetti, and Mueser Rutledge. In response, LiRo is supplying Tully with a broad range of personnel: structural engineers, architects, construction managers, accountants, and safety inspectors.

Over a dozen of LiRo's top personnel – including the firm's president, John Lekstutis – now spend most of their time at ground zero. The tasks have been difficult and varied.

[...]

Ramps and Bridges. In addition to the construction engineering required for the debris removal, LiRo's on-site engineers have been faced with many structural design assignments. The firm worked with Mueser Rutledge to develop a means to support Church Street, which must be kept open for emergency vehicles. Accessing some of the collapsed areas has also proven to be a challenge, requiring the design of ramps to support heavy equipment. Then there were the two pedestrian bridges crossing West Street; with these now destroyed, residents of Battery Park City have no easy means to reach their homes. LiRo is collaborating with NYSDOT, NYCDOT, and Tully to provide a temporary pedestrian bridge over West Street at Rector Street. The bridge will include stairs, lifts for ADA access, and weather protection.

November 2001



Protecting the slurry wall, which keeps out ground water and the Hudson River, is a major engineering task requiring the combined efforts of many firms. Mueser Rutledge is leading the effort, with contractor Nicholson drilling holes and placing the tie-back system that will keep the wall in place. Bovis is providing construction management. Tully is responsible for the work platforms. LiRo is helping to monitor the movement of the wall and safety of the platforms.

The Recovery Effort. Contractor D. H. Griffin Wrecking Company of North Carolina is providing general demolition coordination for the entire site. LiRo is helping them develop sequencing plans for the demolition and removal.

The work is both heavy and delicate, as ongoing recovery activities slow the process of [...]"

(E) Statement by engineer R. Garlock

Photograph and Quote¹⁰:



“RICH GARLOCK: Going below, it was smoky and really hot. We had rescue teams with meters for oxygen and carbon dioxide. They also had temperature monitors. Here WTC 6 is over my head. The debris past the columns was red-hot, molten, running. I did some quick numbers with Gary Panariello, an engineer from Thornton-Tomasetti, to try and determine what the load on WTC 6 was and how much of the lateral system of the building the contractor could take down. There were a lot of judgment calls; people had immediate needs and needed immediate responses.”

Background of the above, **quote¹¹**: *“Richard Garlock, 34, a structural engineer at Leslie E. Robertson Associates (LERA). [...] Using the architectural drawings, the team first directed rescue personnel to areas in the rubble where people might have been trying to exit or escape: stairwells, elevators. Later they looked for structures in the basements where people might have sought shelter from the collapse, areas that could still be intact or where there might be a supply of food and water. [...] Mapping the ever-changing subterranean world below the pile was a ceaseless task. Working with Peter Rinaldi from the Port Authority and engineers from Mueser Rutledge Consulting Engineers (MRCE), Garlock and his LERA colleague Billy Howell descended almost daily on reconnaissance missions to review intact structure, the location of debris and the stability of the slurry wall. They would then compile their notes and MRCE would then use the information to draft damage assessment maps — underground snapshots for the contractors and rescue workers.”*

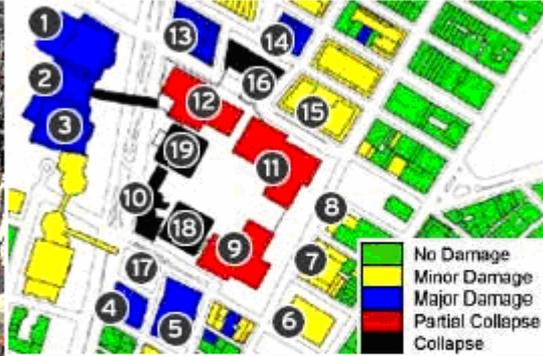
The statements by R. Garlock and by Ken Holden (see below) are offered on “debunking” websites as proof that the exceptional heat was in no way connected to a use of thermite. However, this argument is inconclusive due to the fact that parts of the North Tower fell into WTC 6, and that parts of the North Tower also rested on Building WTC 6. See the following **photograph and quote¹²**:

¹⁰ Quoted from: http://www.pbs.org/americarebuilds/engineering/engineering_debris_06.html . The website <http://www.pbs.org/americarebuilds> provides online information connected to the film “America Rebuilds: A Year at Ground Zero” (a production of Great Projects Film Company, Inc. and Shadowbox Films, Inc. in association with Trigger Street Productions, Inc.).

¹¹ Quoted from: http://www.pbs.org/americarebuilds/profiles/profiles_garlock.html.

¹² From: http://www.pbs.org/americarebuilds/engineering/engineering_buildings_12.html

ASSESSING BUILDINGS



Click on the numbers for more information

World Trade Center 6

DAVE PERAZA: Heavy debris from North Tower destroyed the interior of this building, home of a U.S. Customs House, leaving a crater that extended into the basement. Fires burned unchecked for days. A total loss, the building was later demolished.

And, photograph¹³:



¹³ Photograph is published on <http://www.911research.wtc7.net/wtc/evidence/photos/gzheli1.html>.

(F) Statement by Ken Holden to the National Commission on Terrorist Attacks Upon the United States

Quote¹⁴:

„Quick, but safe decisions regarding where to put the cranes had to be made, inspection of the slurry wall and water in the basement were conducted, while numerous fires were still burning and smoldering. Underground it was still so hot that molten metal dripped down the sides of the wall from Building 6. Cars - both burned and pristine - were suspended in the air balanced on cracked parking garage slabs.”

Ken Holden worked as Commissioner of the New York City Department of Design and Construction at Ground Zero.

(G) Statement associated with Ch. Vitchers

Quote¹⁵:

„The heat was intense in the beginning. Vitcher's crew picked up 40 to 60 foot-long pieces of steel impaled in the pile, where the bottom 20 feet would be glowing redhot, "Like a poker in a fireplace." Trucks loaded with steel would pass by and you could feel the back of your neck burning, standing 20 feet away. At times it was hard asking his people to do dangerous jobs, says Vitchers, but no one ever refused.[...]"

Charlie Vitchers worked as a superintendent for Bovis Lend-Lease at Ground Zero. From January 2002 the Department of Design and Construction “*transferred oversight of the entire sight to Bovis*”.

(H) Quote by an unnamed Bechtel engineer

Quote¹⁶: *“The debris piles are amazingly hot. Daily, infra red pictures are taken from aircraft (or maybe satellite--I do not know which), to try to locate submerged fires and hot spots. No one wants surprises because as rubble is removed from piles, random pockets of steel, glowing brilliant red, are uncovered. Sometimes new fires erupt--sometimes the steel just glows because there is nothing left near by to burn. A curious phenomenon, no fuel to burn but something, heat migrating through the pile, continues to keep the steel at over 1,000 F. When that happens, work stops, equipment pulls back and the firefighters put thousands of gallons of water on the piles to cool them down. Huge billowing clouds of steam are created, and we wait.”*

¹⁴ Quoted from the statement of Ken Holden to the National Commission on Terrorist Attacks Upon the United States April 1, 2003; http://govinfo.library.unt.edu/911/hearings/hearing1/witness_holden.htm.

¹⁵ Quoted from http://www.pbs.org/americanrebuilds/profiles/profiles_vitchers_2.html.

¹⁶ This quote was found at: http://nielsenhayden.com/electrolite/archives/earchive_2001_10.html: “*Linked from Phil Agre's Red Rock Eater, a Bechtel engineer's chronicle of Ground Zero excavation.*” Only a short extract was to be found at this website (posted there on October 24, 2001). You would expect that the “webarchive” shows a track record of the original website where the “chronicle ...” was posted. But instead it looks as if the website in question existed in 1999, 2000, 2002 etc. but not in 2001. A few websites still have a link to the “chronicle” so you can assume that the website with the “chronicle ...” must have existed in 2001.

(I) Statement by New York Fire Commissioner Thomas von Essen

The following statement by New York Fire Commissioner Thomas von Essen is from an interview that he gave Larry King from CNN. See the excerpt from the interview, which was aired on October 6, 2001.

Quote:

"KING: How do you know that there isn't some materials in there that might explode?"

VON ESSEN: Well, I think they would have by now. You know, it's so hot, it's a really hot fire. The steel has been hot for three weeks now. Tremendous heat below, you know. It's -- the fire is not out down below. [...]

KING: You think a lot of the bodies just...

VON ESSEN: Yeah.

KING: Turned to dust?

VON ESSEN: I think a lot of them -- the heat, just the so...

KING: Evaporated?

VON ESSEN: Yeah. And the compression, the weight of 110 stories turned into 80 feet, you know, all 110 stories -- we had to 80 feet of rubble when we started. So, you know, you know, so what can you do?"

Quoted from: "CNN LARRY KING WEEKEND": "Compelling Stories From Ground Zero"¹⁷.

¹⁷ <http://transcripts.cnn.com/TRANSCRIPTS/0110/06/klw.00.html>; This Larry King interview also contains a statement that seems informative with regard to the question how to interpret the word "explosions" when it is used by fire fighters in descriptions of the Twin Towers collapses:

"VON ESSEN: That's the building they were worried about collapsing.

KING: That one?

VON ESSEN: Yeah, (UNINTELLIGIBLE). It's got a little bit of a (UNINTELLIGIBLE) on the top, so people thought it was going to collapse. And in the first day or two, there was a lot of panic going on, because we didn't know. Now we have a handle on it, but the first day or two, they didn't know if there were secondary devices in other buildings, people were running, you know, very afraid."

The CNN transcript contains the following disclaimer: "THIS IS A RUSH TRANSCRIPT. THIS COPY MAY NOT BE IN ITS FINAL FORM AND MAY BE UPDATED."

(J) Thermal images

(1) The large number of thermal images acquired

Numerous thermal images¹⁸ of Ground Zero were acquired in the weeks following 9-11 in addition to measurements of temperatures on the ground and by helicopter. This shows that the high temperatures/persistent heat phenomenon was an important issue at Ground Zero. See the following quotes regarding the large number of thermal images acquired, and regarding the temperature measurements.

Quote¹⁹:

During the initial phase of response and recovery, flights by EarthData (EarthData 2001) provided thermal imagery every other day. Commencing on 16th September, data were acquired using a tripod mounted Raytheon Nightsight Palm IR 250 thermal camera, carried aboard a Navajo Chieftain aircraft. Flights were undertaken just after daybreak, to minimize the effects of solar heating on the scene. The resulting thermal data (see Figure 3-6) has a spatial resolution of 2ft and was captured on a video format. Individual scenes were obtained by "frame grabbing". This is a process of pausing the video, creating an image [...]

From October 17th to October 22nd, EarthData thermal imagery was also obtained using a FLIR ThermoCAM SC2000 radiometric camera. This logs individual frames on a PCMCIA card, rather than recording continuously on videotape. The resulting data is in 8-bit (256 level) format. [...]

¹⁸ **Quote:** "In simple terms, thermal imagery records the temperature of a designated surface, in this instance the debris pile at Ground Zero. The 'temperature' is actually a calibrated measure of emittance in the thermal region of the electromagnetic spectrum, which falls just above the visible wavelengths that were studied using multispectral sensors (see Section 3.2). For the World Trade Center, data was collected using both airborne and satellite sensors. The SPOT 4 coverage was acquired soon after the terrorist attacks, with airborne imagery from EarthData Aviation and AVIRIS delayed until the 16th September, due to the ban on air traffic." Quoted from "Emergency Response in the Wake of the World Trade Center Attack: The Remote Sensing Perspective" By Charles K. Huyck and Beverley J. Adams in: MCEER Special Report Series, Engineering and Organizational Issues Related to The World Trade Center Terrorist Attack; Volume 3, June 2002; http://imagecatinc.com/reportspubs/wtc_mceer.pdf, pages 20f.

Any body emits electromagnetic radiation (if it is above zero Kelvin). Infrared radiation and visible light is electromagnetic radiation. The wavelength spectrum and the intensity of the emitted radiation of a given object depend on the temperature. The intensity of the emitted radiation rises with the temperature. The maximum of the emitted wavelength spectrum shifts to shorter wavelengths with rising temperature (for example: a yellow-hot object is hotter as a red-hot object; a red-hot object is hotter as an object that emits infrared radiation but no visible light). Some explanations regarding different remote sensing images (including thermal images) can be found in "Emergency Response ..." (see above), and in the article "Multisensor fusion over the World Trade Center disaster site", by Craig Rodarmel, Lawrence Scott, Deborah Simerlink, and Jeffrey Walker; EarthData Aviation, in "Optical Engineering", Vol. 41 No. 9, September 2002 2121, which is documented at the website [governmentterror.com \(http://governmentterror.com/images/JOE002120.pdf\)](http://governmentterror.com/images/JOE002120.pdf).

¹⁹ Quoted from "Emergency Response ...", see above, pages 21 and 23.

The most frequently used thermal infrared data was flown by EarthData (see Figure 3-6). As with all of the data collected by this company, imagery was widely distributed and well publicized.[...]

In addition to the above, specialists of the US Army acquired thermal images and measured ground temperatures, **quote**²⁰:

In order to assist Rescue and Recovery personnel after 11 September 2001, Night Vision and Electronic Sensors Directorate was requested to collect a variety of airborne electro-optic data of the WTC site. The immediate objective was to provide FDNY with geo-rectified high-resolution and solar reflective hyperspectral data to help map the debris-field. Later data collections included calibrated MWIR data. This thermal data provided accurate temperature profiles, which could be warped to the high-resolution data. This paper will describe the assets [...]

MITRE suggested to OEM that they request help from the USA CECOM RDEC Night Vision and Electronic Sensors Directorate's (NVESD) Night Vision Imaging Spectrometer (NVIS) sensor suite, which includes a high resolution imager. By coincidence, NVIS was installed in an aircraft and ready for flight tests.

On September 19th, a request for assistance came from the New York City OEM through MITRE's contacts at US Army CECOM to the NVESD to fly the sensor suite and geo-rectify the High Resolution Imagery into GIS maps. Two hours later, the Twin Otter was airborne, heading to New York with the following five sensors on-board: HRI 6000 element line-scanner; NVIS HSI 0.4-2.4 microns, 384 bands; MWIR Calibrated Thermocam; Color Video Camera; CMIGITS GPS/INS unit attached to the sensor frame. [...]

The same model 3 – 5um calibrated thermal camera was used by the NVESD field support team to measure debris temperatures from the ground. The ground based thermal camera temperature measurements were considerably higher than the airborne thermal camera measurements. This was due to the physical pixel size difference between the ground based and airborne images. Airborne temperature measurements were lower due to averaging of material temperatures in the larger pixels.

In addition, “*Thermal measurements taken by helicopter each day ...*” were performed²¹.

Fire fighters used additional equipment, **quote**²²:

Fire fighters used the thermal scenes for reference and crosschecking, but mainly relied on onsite sensors (D. Kehrlein).

²⁰ Quoted from “Airborne remote spectrometry support to rescue personnel at “Ground Zero” after the World Trade Center attack on September 11, 2001”, by Chris Simi, Anthony Hill, Henry Kling, US Army CECOM RDEC Night Vision and Electronic Sensors Directorate; Jeny Zadnik, Marc Sviland, Mary Williams, E-OIR Measurements Inc.; Paul E. Lewis, U.S. Government, <http://spiedl.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=PSISDG004816000001000023000001&idtype=cvips&gifs=yes> A copy of this article is documented at governmentterror.com (<http://governmentterror.com/images/s59ec61u.pdf>).

²¹ See above; (A) statement by Bechtel engineers.

Differences “between sequential days” as late as 18th, 19th, 20th, 21th, and 22th October were used for **(quote)**: “demonstrating the success of firefighting strategies and providing a focus for response teams the following day”²³.

Several thermal images from different sources (SPOT, Earth Data, AVIRIS) are published in the article “Emergency Response in the Wake of the World Trade Center Attack: The Remote Sensing Perspective”²⁴. The images by AVIRIS/NASA are published in “Environmental Studies of the World Trade Center area after the September 11, 2001 attack.”²⁵ Twenty five thermal images by EarthData are published on their website²⁶. Two thermal images acquired by the Multispectral Thermal Imager on September 12 were published in the news bulletin of the Los Alamos National Laboratory²⁷.

(2) The persistence of hot-spots at the same locations for days and weeks

If you compare the 25 **thermal images**²⁸ by EarthData that are published on their website you can see that the area covered by hot spots becomes smaller over time, but the general location of the hot spots does not change. You have hot spots at the same places for weeks. This seems to be inconsistent with the assumption that the hot spots were due exclusively to underground fires. Any fire at a given location will have consumed all burnable matter at some point and will stop burning at this given spot²⁹. Even if you consider that fires might have burnt at different levels at different times under the surface at any given spot, and that a single spot that seems small on the image in fact covered a relatively large area it seems

²² Quoted from “Emergency Response....” (see above), page 35.

²³ Quoted from “Emergency Response ...” (see above), page 35 (48 of 58 in PDF).

²⁴ “Emergency Response ...”, see above, http://imagecatinc.com/reportspubs/wtc_mceer.pdf.

²⁵ By Roger N. Clark¹, Robert O. Green², Gregg A. Swayze¹, Greg Meeker¹, Steve Sutley¹, Todd M. Hoefen¹, K. Eric Livo¹, Geoff Plumlee¹, Betina Pavri², Chuck Sarture², Steve Wilson¹, Phil Hageman¹, Paul Lamothe¹, J. Sam Vance³, Joe Boardman⁴ Isabelle Brownfield¹, Carol Gent¹, Laurie C. Morath¹, Joseph Taggart¹, Peter M. Theodorakos¹, and Monique Adams¹.⁽¹⁾U. S. Geological Survey, Denver, Colorado, ²Jet Propulsion Lab Pasadena, California. ³U.S. Environmental Protection Agency, Region 8 Denver, Colorado, ⁴Analytical Imaging and Geophysics, LLC Boulder, Colorado, Published November 27, 2001, http://pubs.usgs.gov/of/2001/ofr-01-0429/thermal_r09.html

²⁶ <http://www.newyork.earthdata.com/thermal.html>

²⁷ <http://www.lanl.gov/orgs/pa/News/NYCphotos.html>. The images were found at www.governmentterror.com.

²⁸ <http://www.newyork.earthdata.com/thermal.html>.

²⁹ See the following **quote** by NIST in this regard:

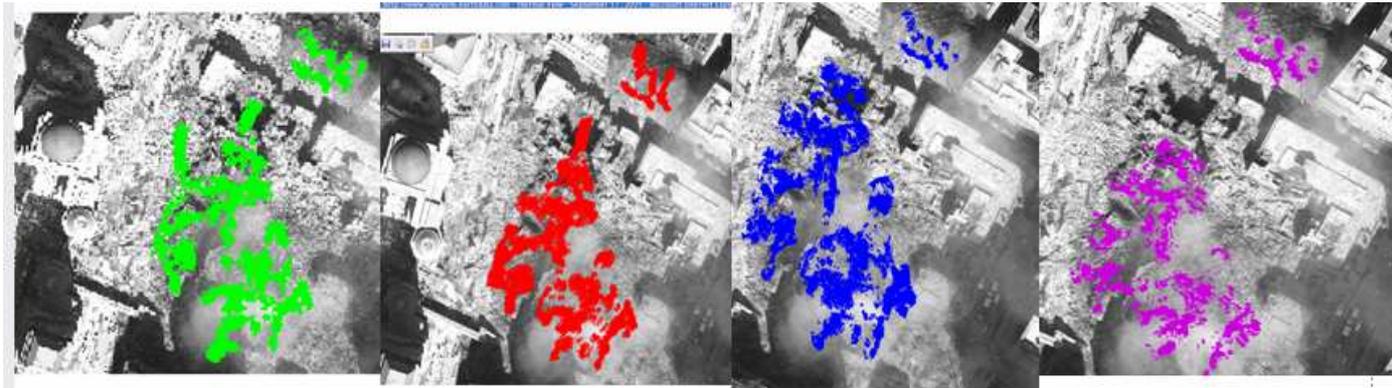
5.3 UNUSUAL BURNING AND SMOKE BEHAVIORS

During the review of the image databases, and particularly videos, a number of observations were made of behaviors that are not characteristic of “typical” building fires. Some of these observations involved the fire behavior. These included examples of extremely rapid apparent fire spread (based on fire appearance at windows on the outer façade). Generally, building fires go through a cycle of growth, intense burning, and decay which takes place on time scales on the order of tens of minutes. There were fires in the towers that burned for much longer periods than this, perhaps indicating the presence of unusually high fuel loads. There were also occasional flare ups of flames suggesting some change within the towers. Observations such as these are described in Chapter 8 and Chapter 9.

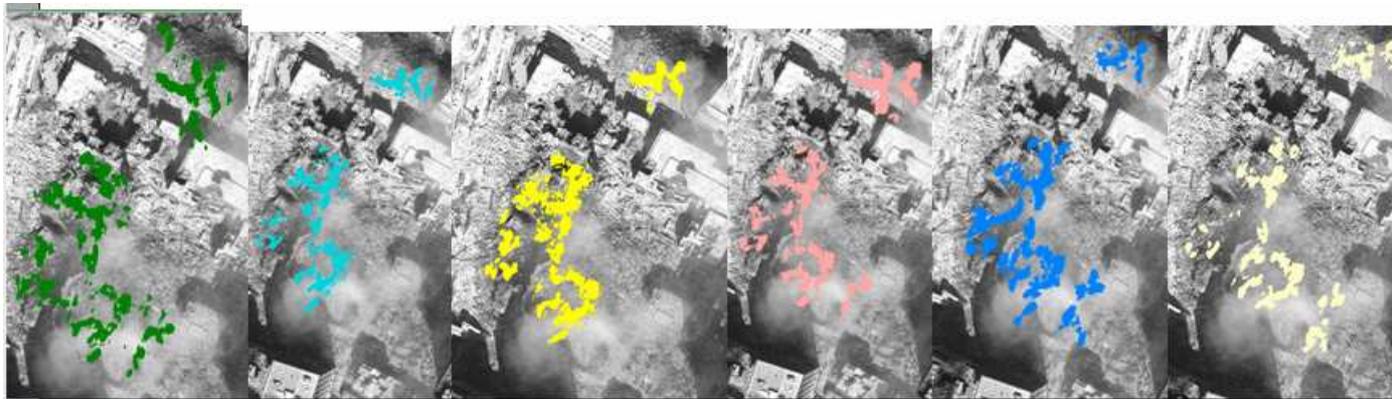
In both towers, there were occasions when large amounts of smoke and/or dust and sometimes flames were pushed simultaneously out of multiple open windows covering several floors and faces of the tower.

Quoted from NISTNCSTAR 1-5A chap 1-8pdf; page 52 (148 of 392 in PDF). A collapse pile fire is not a building fire, and it is more likely for it only to smoulder. However, even smouldering will have consumed the burnable matter at a given location after some time.

impossible to explain how the heat persisted for weeks at the same spots due solely to burning fires. The 25 **thermal images**³⁰ by EarthData (the images are not precisely scaled)³¹:



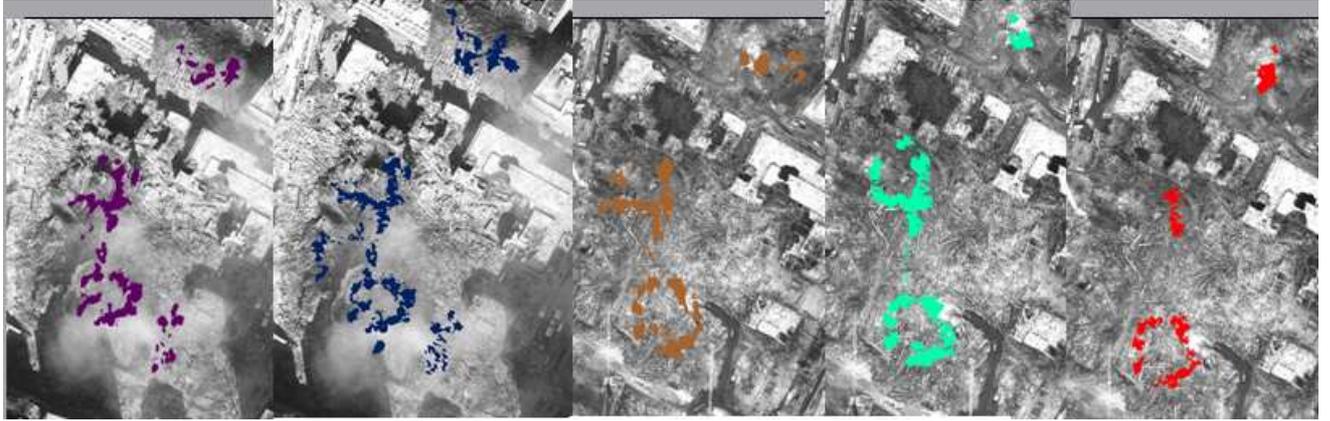
Above (from left): images from September 16, 17, 18, and 19



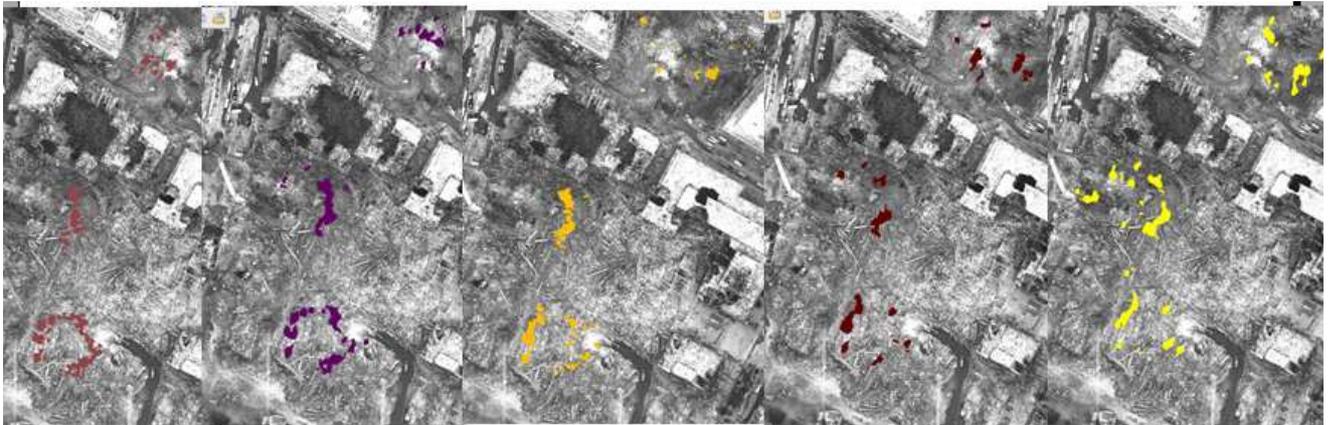
Above (from left): images from September 20, 21, 22, 23, 25 and 26

³⁰ The caption at the EarthData website states (**quote**): “The image above [thermal image September 16] is a computer composite of an orthophoto map image (horizontally accurate to plus or minus three feet) of the World Trade Center site acquired on September 17, 2001 combined with an image captured using a thermal camera system. The color composite overlay is generated using a thermal sensor that is sensitive to infrared radiation rather than light and thus shows the location of hot spots within the debris field where there is a strong probability of lingering underground fires. Thermal images captured after September 28, 2001 are displayed over the September 30, 2001 orthophoto map image.” (An orthophotography is an image that is geometrically adjusted to correct lens distortion and other factors.)

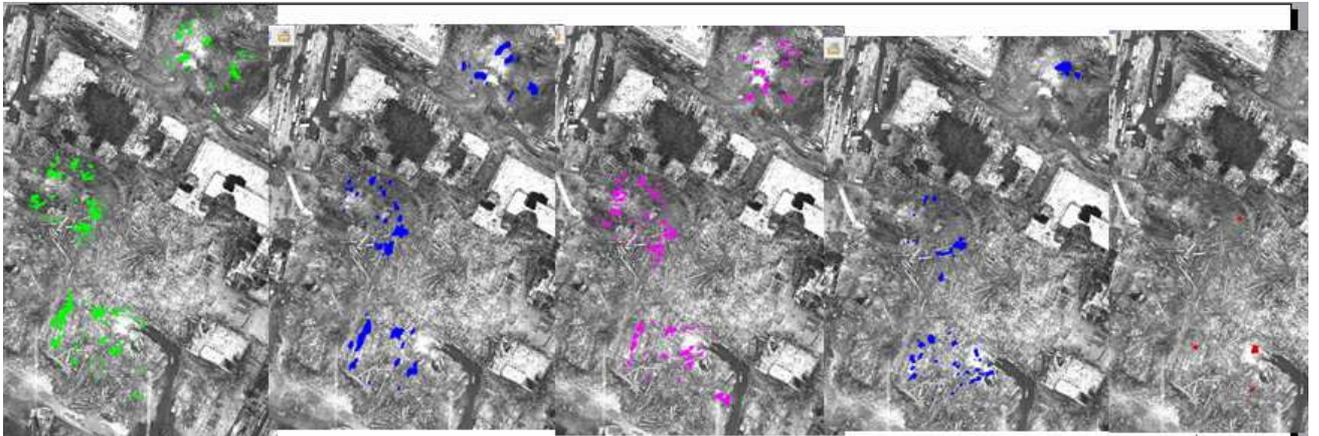
³¹ Note that the images show those parts of the surface that are relatively hotter than other parts of the surface for any of the given days. Changes in the thermal images can be due to different reasons: the heat source cooled down, or was put out, or hot material was removed (the spot is no longer visible in these cases), a layer that acted as insulation is removed, or a fire starts or gets access to more oxygen (a new spot is visible). In addition, if you have for example a new very hot “hot spot” (e.g. by removing an insulation layer) it might be that relatively cool “hot spots” will be no longer visible because they fall below the threshold. Or the opposite: a very hot “hot spot” is removed or put out with the result that cooler “hot-spots” will be included in the image. (Such effects might, for example, explain why you see some hot spots to the right of the former WTC 2 on the five images September 16 to 20, but not on the images September 21 and 22, but again on the images September 23, 25, 26, 27, and 28.)



Above (from left): images from September 27, 28, 29, 30, and October 1.



Above (from left): images from October 2, 3, 4, 5, and 7.

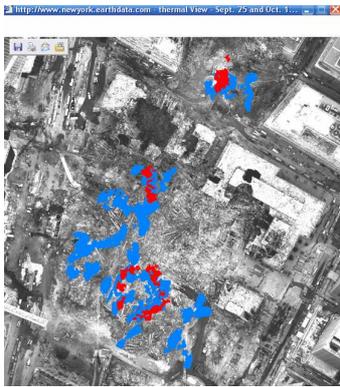


Above (from left): images from October, 8, 9, 10, 15 and 21.

Two comparisons provided by EarthData³²:



“Comparison of September 16, 2001 (green) and September 22, 2001 (yellow)”



“Comparison of September 25, 2001 (blue) and October 1, 2001 (red)”

(3) All three collapse piles from WTC 1, WTC 2, and WTC 7 emitted infrared radiation with similar intensity

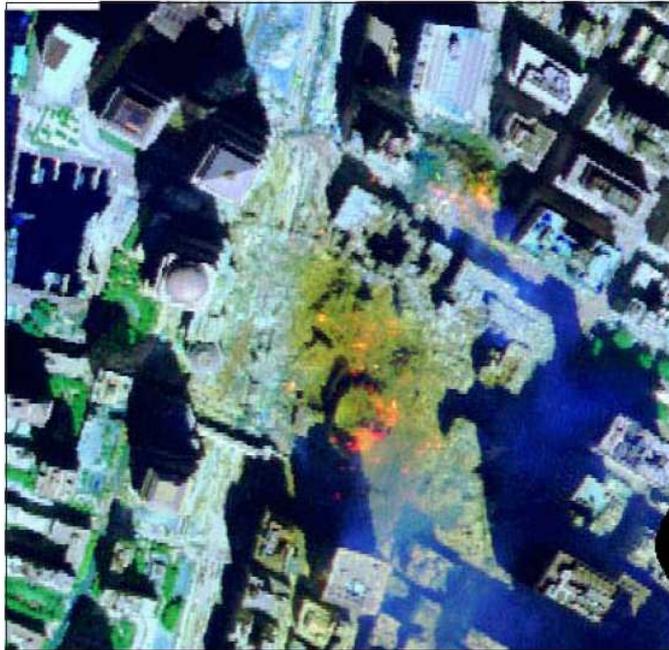
On several of the published thermal images all three collapse piles (of WTC 1, WTC 2 and WTC 7) are pictured together. Remarkably, given that the heat phenomenon was very unusual (see, for example, the above quote by Cahill et al.), all those images document that the high temperatures/persistent heat phenomena were very similar in terms of emitted infrared radiation in all three collapse piles for some weeks.

The image acquired on September 12 by the Multispectral Thermal Imager is the earliest published thermal image that covers all three collapse piles (see the image below in paragraph 5). The collapse pile of WTC 7 appears on September 12 as a smaller hot spot compared with the collapse piles of WTC 1 and WTC 2 but it appears at the same intensity (indicated by the yellow color).

See also the above images by EarthData, and see below (in paragraph 4) the estimated surface temperatures from the USGS (hot spot “A” from the collapse pile of WTC 7 is estimated as similarly hot as the hottest spot “G” from the Twin Towers collapse piles), and see the following thermal images dating from between September 16 and October 10:

³² <http://www.newyork.earthdata.com/thermal.html>.

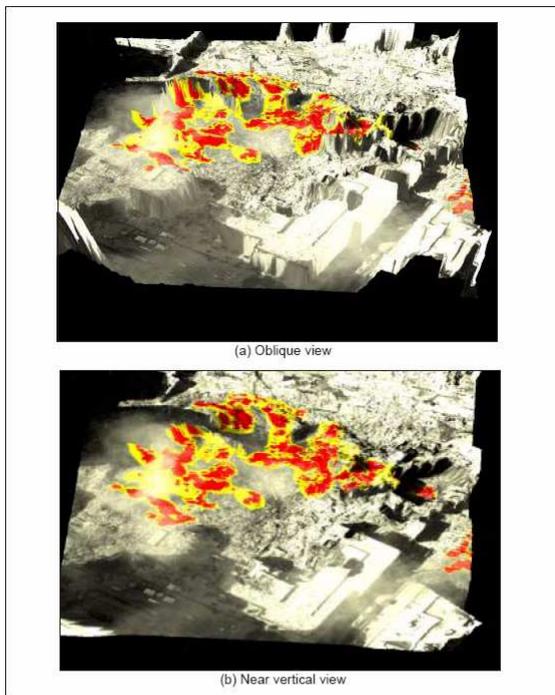
Image by AVIRIS/NASA/USGS³³:



Note: This data was not integrated into GIS products produced in New York

Figure 3.7. AVIRIS thermal image showing hotspots at Ground Zero on the 16th September 2001 (Clark et al., 2001).

Image by EarthData³⁴:



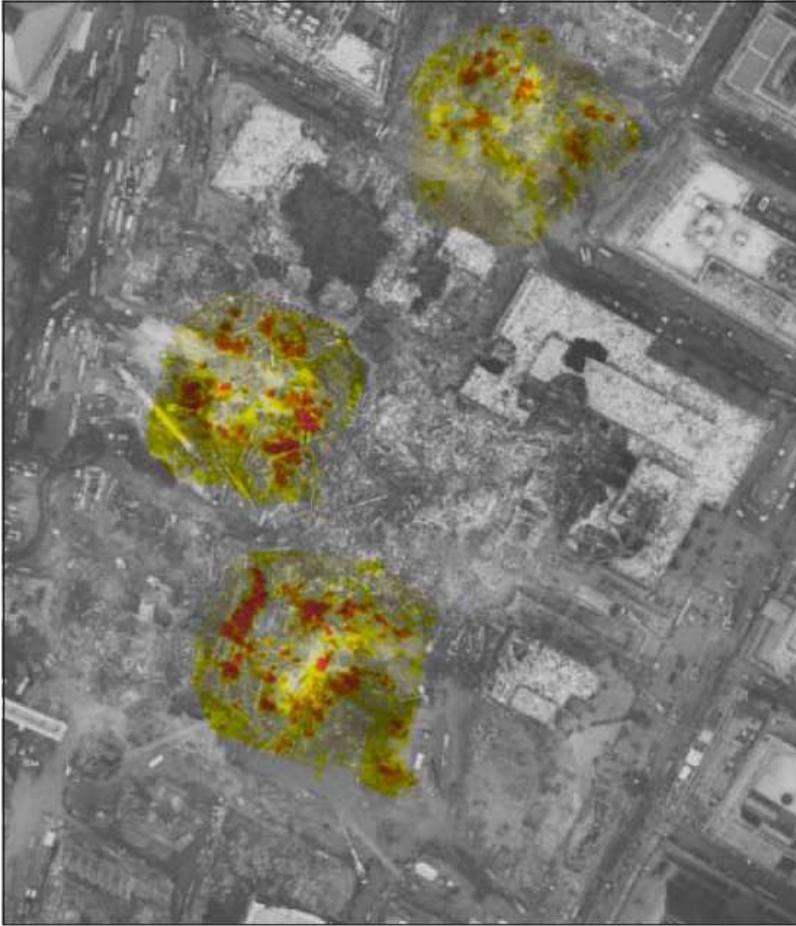
Note: The yellow and red zones represent hot spots. Smoke is still present in the images, affecting visibility. The data represented here were all collected on September 17th by EarthData.

Figure 3.9. Visualization of Ground Zero, with orthophotography and thermal data draped over a LIDAR 3D terrain model.

³³ Here: image with caption from “Emergency Response ...”, see above, page 23.

³⁴ A part of the collapse pile of WTC 7 is visible at the right edges of the images. Images with caption from “Emergency Response ...”, see above, page 32 (45 of 58 in PDF).

Image by EarthData³⁵:



Note: Thermal data are overlaid on an orthophotograph obtained on October 8th. Variations in temperature are evident across the site. However, these values were acquired (and are therefore displayed) using an 8-bit radiometric scale, rather than an absolute calibration such as degrees Fahrenheit

Figure 3.6. Thermal image of Ground Zero acquired by EarthData on the 7th October 2001, using a Raytheon airborne sensor.

(Note, that no unusual phenomena relating to high temperatures or persistent heat were reported from the Pentagon collapse site.)

(4) Estimation of surface temperatures

The published thermal images show in the first place only the differences in the intensity of emitted infrared radiation between single locations on the surface. However, if you have the raw-data it is possible to estimate absolute surface temperatures at single spots based on the intensity of single groups of wave-lengths. In addition, it is possible to calibrate a sensor³⁶. Estimates of the absolute surface temperatures exist in the public domain for the images by AVIRIS/NASA. The surface temperatures of the two hottest spots on September 16 were estimated in the USGS study as 1020 and 1000 Kelvin (747 and 727 degrees Celsius (**table, and “thermal figure”**³⁷):

³⁵ Image with caption from: “Emergency Response ...”, see above, page 22 (35 of 58 in PDF).

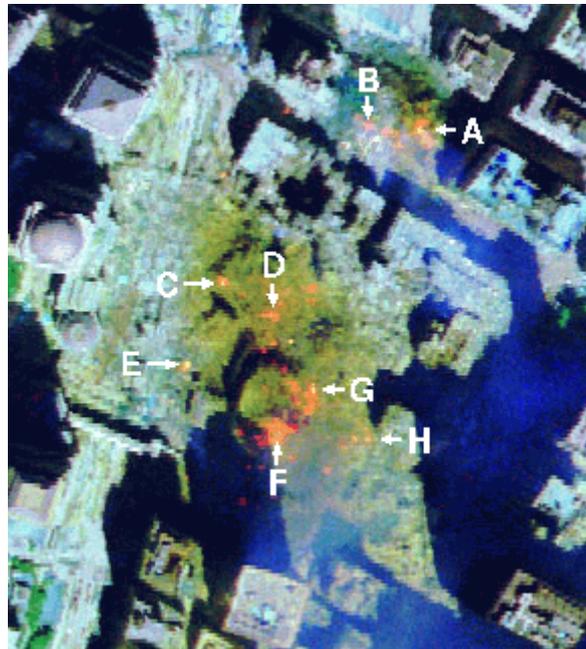
³⁶ The sensor of the Multispectral Thermal Imager that took images on September 12 is probably calibrated. But up to now no temperature data seems to have been published.

³⁷ From “Environmental Studies ...”, see above, <http://pubs.usgs.gov/of/2001/ofr-01-0429/thermal.r09.html>.

Table 1 Thermal Hot Spot Data

Hot Spot	Location		Temperature (Kelvin)	Area	
	N Latitude	W Longitude		% FOV	sq meter
A	40° 42' 47.18"	74° 00' 41.43"	1000	15	0.56
B	40° 42' 47.14"	74° 00' 43.53"	830	2	0.08
C	40° 42' 42.89"	74° 00' 48.88"	900	20	0.8
D	40° 42' 41.99"	74° 00' 46.94"	790	20	0.8
E	40° 42' 40.58"	74° 00' 50.15"	710	10	0.4
F	40° 42' 38.74"	74° 00' 46.70"	700	10	0.4
G	40° 42' 39.94"	74° 00' 45.37"	1020	1	0.04
H	40° 42' 38.60"	74° 00' 43.51"	820	2	0.08

Positions are in degrees-minutes-decimal seconds, datum WGS84.
Position accuracy is estimated to be approximately +/- 6 meters (18 feet).



“Thermal Figure 4. Index for the locations of some of the hot spots observed on September 16, 2001.”

It seems justified to question if such surface temperatures can be explained by the low heat release rate of oxygen starved underground fires in dust covered collapse piles. In addition, you would expect that office contents (which included paper and parts of furniture made from wood or wood chips) burning in oxygen starved air would produce a relatively dark smoke. However, on **photographs**³⁸ dating from September 16 the smoke does not appear as dark:

³⁸ Found at <http://www.911research.wtc7.net/wtc/evidence/photos/groundzero.html> . According to this website the photographs were provided “by New York City’s Office of Emergency Management”.



[Pictured is the collapse pile of WTC 7.]



[Former North Tower with building WTC 6 at the bottom.]



[Former WTC 7 is in the left-most position, former WTC 1 is left from the center, former WTC 2 is right from the center]

See also the following **quote**³⁹: “Thomas A. Cahill, who leads the [DELTA \(Detection & Evaluation of Long-Range Transport of Aerosols\)](#) group at UC Davis, is more concerned about the possible health risks of the plume from WTC. Cahill first started to wonder about the plume after the rainfall of Sept. 14. “The color of the plume was all wrong,” he said. “It was a light blue. My background is atmospheric physics, and the color of the plume tells me a lot. A light blue plume means very fine particles. Clearly, the pile was still hot and was giving off very fine particles.” Yet very fine particles, he said, are more characteristic of a very high temperature process, such as a coal-fired power plant, a smelter, or a diesel engine. The pile at ground zero wasn't hot enough to generate such fine particles.”

Both, the absence of dark smoke and the estimated surface temperatures seem to be inconsistent with the assumption that the heat in the collapse piles was caused exclusively by underground fires.

According to the USGS study the hot spots were clearly cooler on September 23, **quote**⁴⁰: “Analysis of the data indicates temperatures greater than 800° F. Over 3 dozen hot spots appear in the core zone. By September 23, only 4, or possibly 5, hot spots are apparent, with temperatures cooler than those on September 16 [...] Hot spots show as orange and yellow areas. Dozens of hot spots are seen on September 16, but most had cooled or the fires had been put out by September 23.”

Probably not much more temperature data, connected to thermal imaging, exists in the public domain. A short discussion of the method used for the calibration of the airborne sensor for the measurements of surface temperatures of the collapse piles is contained in the study “Airborne remote spectrometry support ...” (see above), **quote**:

Using the NVIS SWIR channels, blackbody temperature estimates were made at several locations by fitting the shape of the blackbody curve to the measured data. These calculated temperatures ranged from 300 to 500 degrees Centigrade. The resulting temperatures calculated from the airborne NVIS SWIR spectrometer data corresponded closely to those taken with the 3 – 5um thermal camera temperature measurements taken from the ground.

One published **thermal image**⁴¹ acquired on October 18 shows a calibration scale:

³⁹ Quoted from “CHEMICAL ANALYSIS OF A DISASTER Scientists struggle to understand the complex mixture of aerosols released during and after the destruction of the World Trade Center”, by Louisa Dalton, in “CHEMICAL & Engineering News”, October 20, 2003, Volume 81, Number 42; CENEAR 81 42 pp. 26-30, <http://pubs.acs.org/cen/NCW/8142aerosols.html>. Note that Cahill offers a hypothesis for the existence of the very fine particles. However, this does not explain why there is no significant amount of dark smoke from burning paper and burning wood chips visible.

⁴⁰ Clark et al., USGS, <http://pubs.usgs.gov/of/2001/ofr-01-0429/thermal.r09.html>.

⁴¹ From “Multisensor fusion over the World Trade Center disaster site”, see above, page 7.

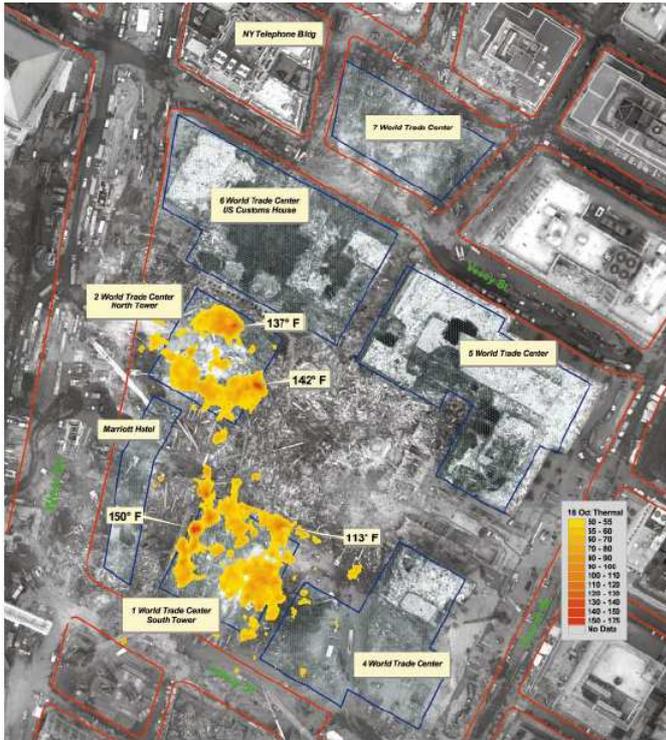
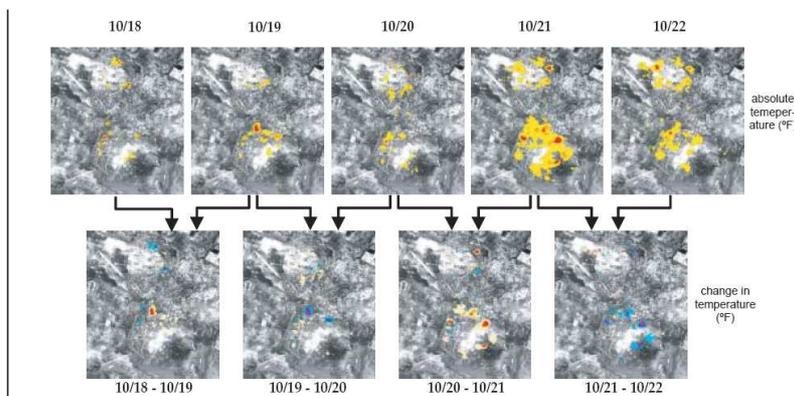


Fig. 5 Thermal data collected over the World Trade Center site on October 18, 2001, overlaid on digital orthophotography collected on October 7, 2001. Building footprints are shown in blue and streets are shown in red.

(Note how well the remaining hot spots fit into the footprints of WTC 1 and WTC 2.)

In addition some **thermal images**⁴² exist that were acquired in late October. They are associated with absolute surface temperatures of between 75 and 125 degrees Fahrenheit:



Note: Absolute readings are in degrees Fahrenheit, with red areas exceeding 125° F and yellow areas between 75° F and 125° F. Difference values reflect the change in temperature between sequential days, demonstrating the success of firefighting strategies and providing a focus for response teams the following day. Yellow, red and orange classes relate to new or expanded hot spots, where the temperature has increased by at least 25° F. Blue and purple areas are associated with cooling of at least 25° F.

Figure 3.11. Temperature data, acquired by EarthData using the FLIR thermal device during October 2001.

According to the caption above, the analyzed thermal images were used for “*demonstrating the success of firefighting strategies and providing a focus for response teams the following day.*” Remarkably, relatively low surface temperatures of between 75 and 125 degrees Fahrenheit were caused by heat sources that were still being dealt with by “*firefighting strategies*” late in October. This puts the statement from the USGS “*but most [hot spots] had cooled or the fires had been put out by September 23.*” into question.

⁴² From “Emergency Response ...”, see above, page 35 (48 of 58 in PDF).

It might be possible to explain the decrease of the surface temperatures with the assumption that the heat was exclusively caused by underground fires. In this case you would have to assume that the fires burnt in a manner that caused the surface to become steadily cooler. This assumption is, at least to some degree, in conflict with the random character of the collapse piles. The assumption that hot material (such as the reported “molten steel”) cooled down slowly in the piles would offer a more ready explanation for the phenomenon.

(5) The SPOT image from 9-11, and the images by the Multispectral Thermal Imager acquired September 12

There do not seem to exist statements on the absolute surface temperatures based on the thermal image acquired September at 11, 11.55 am (SPOT image⁴³), or based on the September 12 thermal images (acquired by the Multispectral Thermal Imager) in the public domain⁴⁴. However, it might be informative to assess the images in the light of the fact that the fires, that were burning in other buildings at the time when the images were taken, are not visible (SPOT image), or less intense visible (one MTI image) on these thermal images.

⁴³ The image is published in “Emergency Response ...”, see above, page 17 (sheet 30 of 58 in PDF)

⁴⁴ At least for September 12 there may exist unpublished temperature data. See the following **quote** that provides also background information: “*The Multispectral Thermal Imager (MTI) satellite, a joint Los Alamos, Sandia National Laboratories and Savannah River Site project, acquired imagery of the New York City area, on mid-day Sept. 12, the day after the World Trade Center incident. The satellite continues to collect images.*

Using information spanning 15 spectral bands, the data analysis team from Space and Remote Sensing Sciences (NIS-2) and Space Data Systems (NIS-3) is mapping the debris field and measuring the temperatures of the hotspots according to project leader John Szymanski of NIS-2. The team also hopes to measure some constituents of the smoke plume.

“One interesting aspect of our satellite is that we can see through the smoke to the ground,” said Szymanski. “Compare the true color image to the some of the images from other satellites such as SPOT and IKONOS, where the smoke obscures the ground,” Szymanski said. “We also can see the hotspots due to fires. Most of the other satellites cannot do this and the ones that can do it with much lower resolution than we do.”

Los Alamos is receiving data from the satellite at the Laboratory's Data Processing and Analysis Center in building 287 at Technical Area 3. There the team processes MTI data into images and begins scientific analysis and distribution of data products to civilian and government research partners.

The Multispectral Thermal Imager is a space-based research and development project sponsored by the Department of Energy's Office of Nonproliferation and National Security. MTI's primary objective is to demonstrate advanced multispectral and thermal imaging, image processing, and associated technologies for national security and earth science applications.

To gather its image data, MTI looks through a 36-centimeter aperture and uses a bank of three sensor chip assemblies, each carrying 15 arrays of cryogenically cooled detectors. The arrays provide MTI with nearly 17,000 tiny detectors, each no larger than the tip of a pencil. The 510-pound instrument is designed to be self-correcting in its data gathering, adjusting for the effects of clouds, water vapor, and airborne particles present in each image of the ground. Such corrections ensure that data analysts have full information about the factors affecting images, exactly as they are captured.[...] The satellite's instrument package was calibrated at Los Alamos; [...]” Quoted from: Los Alamos national Laboratory Daily News Bulletin.

SPOT image acquired September 11, 11.55 am

The SPOT image shows most of Ground Zero and parts of the surrounding area obscured by smoke. The obscured parts appear black on the image. Two red spots indicating infrared radiation are clearly visible⁴⁵:



The caption (from the article “Emergency Response ...”) states: “*Note: Hotspots associated with fires raging at Ground Zero appear in red. [...]*”. However, “raging fires” are reported for this time from surrounding buildings, but not from the collapse piles of WTC 1 and WTC 2. FDNY battalion commander Richard ‘Pitch’ Picciotto, who survived the collapse of the North Tower together with other persons in a stairwell, describes in his book that the raging fires in WTC 5 and WTC 6 constricted the efforts to rescue him and the other survivors. Picciotto does not mention in his book that fires raging elsewhere at Ground Zero would have affected the rescue⁴⁶.

⁴⁵ The satellite that captured the image has “two sensors: a multispectral device with a spatial resolution of 20 meters (m) and a finer resolution panchromatic device that can record objects of 10m. Four multispectral bands occupy blue (0.5-0.59 μm), green (0.61-0.68 μm), red (0.79- 0.89 μm) and infrared (1.58-1.75 μm) wavelengths. The panchromatic band occupies a single range in the visible (0.61-0.68 μm) region of the spectrum.”

Quoted from “Emergency Response ..”, see above, pages 14f.

⁴⁶ “LAST MAN DOWN, THE FIREMAN’S STORY”, by R. Picciotto, published in Great Britain in 2002 by Orion Books, first edition, page 125. The book contains a description of the scene when he has eventually radio contact with fire-fighter Mark Ferran. Given the approximate time when this contact took place it must have been before or about the time when the above thermal image was taken. **Quote:** “*He [fire fighter Mark Ferran] told me later that over that entire rubble field, acres and acres of mass and terrifying destruction, there wasn’t much to hear. Ninety or so minutes after the north tower collapsed, the place had pretty much cleared of all human life, and there was only now some sprinkling or rescue activity. There were raging fires up above, in Six World Center and Five World Center, and behind those buildings, to the north, Seven World Trade Center had been taken out by the collapsing rubble of the two towers, but there was surprisingly little movement elsewhere on the complex.*” The description of the actual rescue that is given in the book repeats this impression: difficult to climb collapse piles due to columns, due to other large building parts, due to the instability of the piles, due to smoke, and due to the raging fires in WTC 5 and 6. Raging fires all over the collapse piles are not described. (This rescue operation was accomplished in the early afternoon.)

The fires in WTC 5 and WTC 6 are reported elsewhere. See, for example, the following **photograph and quote**⁴⁷:

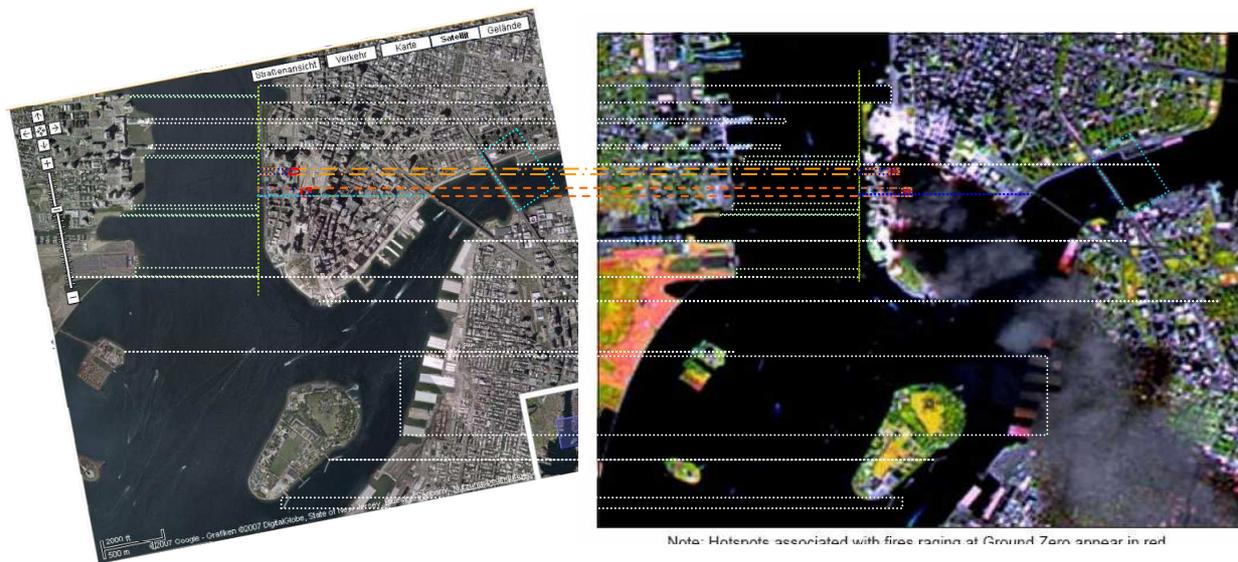


World Trade Center 5

DAVE PERAZA: Nine stories high, World Trade Center 5 was hit by heavy debris from the collapsing towers and planes. Fires raged throughout the building causing internal collapses. A total loss, the building was demolished as part of the cleanup work.

For the fire in building WTC 6 see photograph and quote above⁴⁸.

It is possible to locate the sources of the infrared radiation by matching the SPOT image to an aerial image⁴⁹.

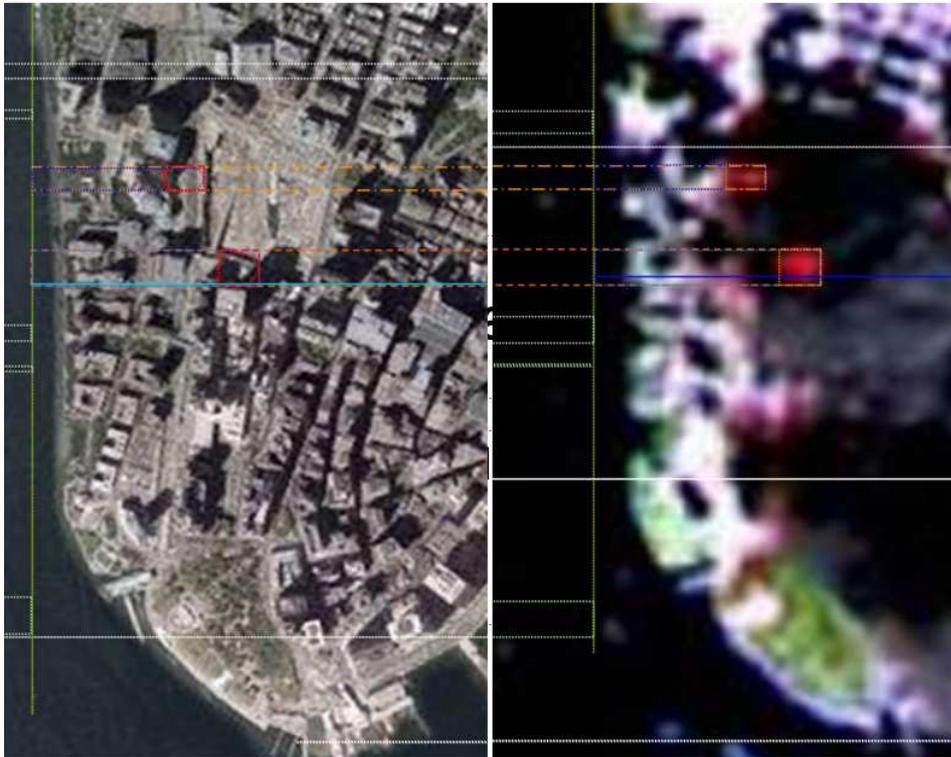


⁴⁷ http://www.pbs.org/americarebuilds/engineering/engineering_buildings_11.html

⁴⁸ In: (E) Statement by engineer R. Garlock.

⁴⁹ The aerial photograph is from "Google maps" (it shows Ground Zero without collapse piles). The angle is adjusted using the blue rectangles that run parallel to Manhattan Bridge. The size is adjusted using the white lines and some landmarks. Because the shore line is not precisely assignable on the SPOT image a line was inserted (bright green) using the distance to some landmarks (green and blue lines).

The hot spots are caused neither by WTC 6, or by WTC 5, nor by other burning buildings, and not by fires on the whole of Ground Zero (note that WTC 7 was still standing when the image was acquired). Instead, the visible hot spots are most likely a pile of parts of the North Tower located east from the footprint of this tower across West Street (between the American Express Building and Merrill Lynch Building), and a pile of parts from the South Tower located between the former footprint of this tower and the Bankers Trust Building. Detail from the above:

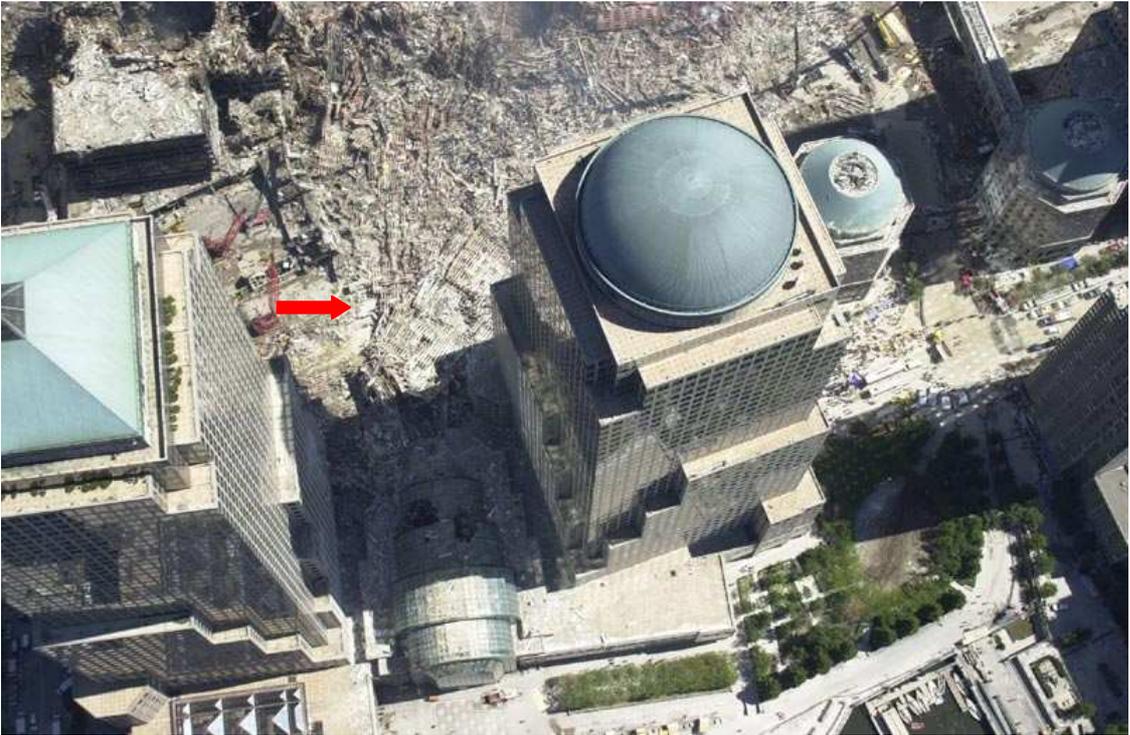


Aerial image with map of the area⁵⁰:



⁵⁰ Aerial image with map from a presentation by Dr. William Grosshandler, Building and Fire Research Laboratory, NIST, U.S. Department of Commerce, 03.October 2005
<http://www.scienceaccelerator.gov/dsa/resultNavFrameset.html?ssid=446c3d23%3A117cd0434e1%3A-4de9&requestType=USER&displayMode=RANK&startPosition=0&resultItem=8&resultCount=39&resultId=67551962&ranked=true&index=8&mode=RESULT>

Both piles are captured on **photographs**⁵¹:



⁵¹ Source of the second and the third photograph (quote from 911research.wtc7.net): “Photos from 9/15/01 Aerial Photos of Ground Zero Provided by New York City’s Office of Emergency Management”.



The SPOT thermal image raises the question of how to explain that raging building fires in WTC 5 and WTC 6 are not visible as infrared emitters on the SPOT image while two parts of the collapse piles are. The possibility exists that a variably thick (or partly absent) smoke and dust layer above Ground Zero might have caused the strange effect that two parts of the collapse piles, containing mostly metal and other non burnable building parts, appear as apparently hotter than raging building fires (note that building WTC 6 even had a big hole in the middle, so for this part it can be ruled out that there were any insulating effects from ceilings).

On one hand, smoke does not necessarily obscure infrared radiation, while on the other hand, some photographs captured at 9-11 show parts of Ground Zero in sunlight and other parts with smoke. If you want to assume that the hot spots were generated by fire you would have to assume that these fires produced a smoke layer too, so you still have the odd situation that only the building fires, which must have been hotter as compared to fires in dust covered collapse piles, are not visible but obscured by their smoke-production. In addition, the SPOT image shows smoke-obscured parts all around the southern hot spot, and at three sides of the northern hot spot. This does not prove the existence of a smoke layer above the visible hot-spots but it makes the existence of such a layer at least above the southern hot spot likely.

Enlarged detail from the SPOT image:



Note, that not only the burning buildings but also other heat sources, such as all the single ground fires burning in adjacent streets, are not visible. It would be useful to know the sensitivity of the SPOT sensor used to discuss the image.

The thermal image from the Multispectral Thermal Imager

The following thermal image was acquired by the Multispectral Thermal Imager on September 12⁵²:



Multispectral Thermal Imager



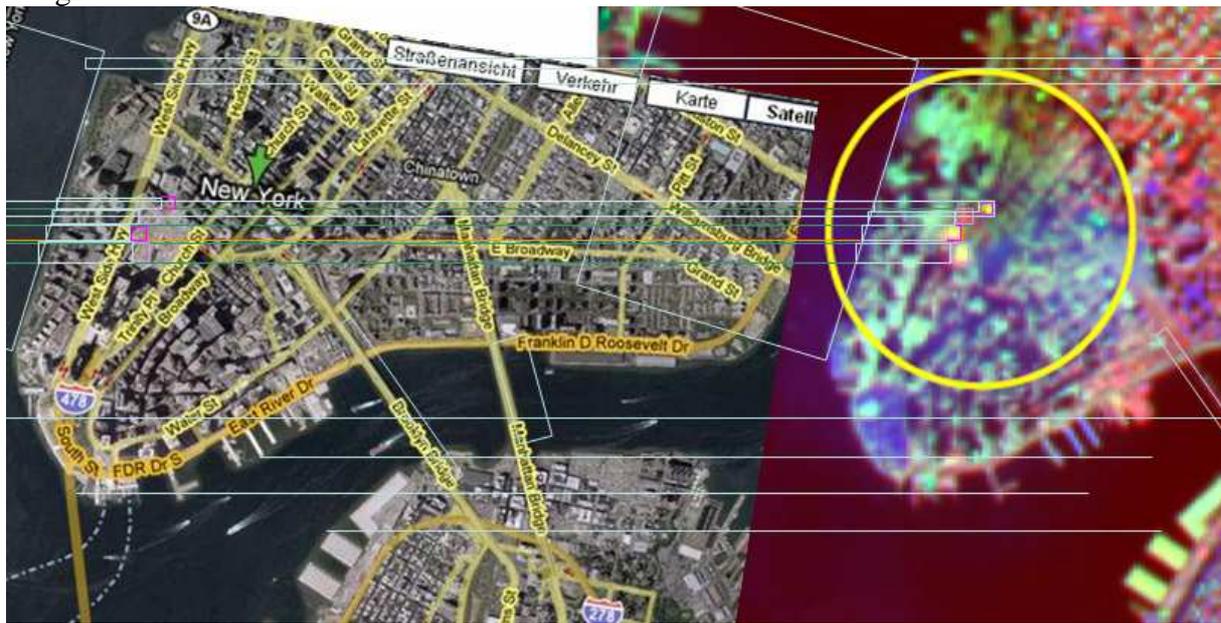
The thermal-near infrared image is a combination of thermal infrared (red), short-wave infrared (green) and near-infrared (blue). This image has approximately 20-meter resolution. The smoke is more transparent in the infrared bands than for a visible image. This image shows differences between the four hotspots in the disaster area due to temperature variations. The hottest areas are yellow and a slightly cooler hotspot is red-orange.

Enlarged detail:

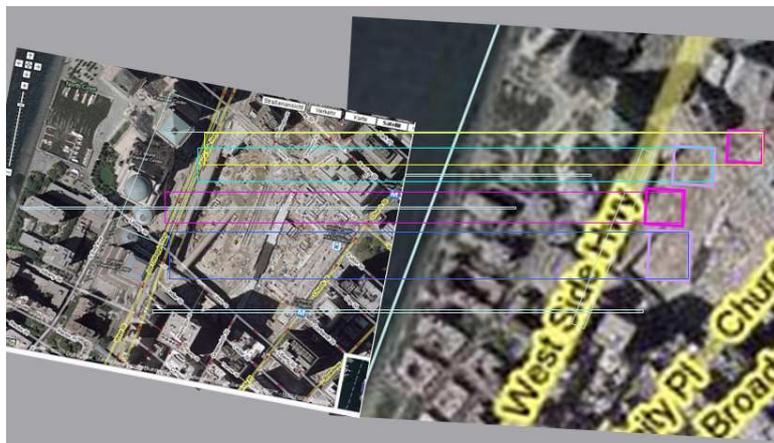


⁵² <http://www.lanl.gov/orgs/pa/News/NYCphotos.html>.

Below, a rough match of the hot spots to a “Google maps” satellite image:



Below, a detail from the above (right), matched for the horizontal position to an enlarged satellite image (left). The vertical positions are deducible from the distance to landmarks like ramps and buildings.



The “*hottest areas*”, the yellow-coloured hot spots, can be assigned as the three collapse piles from WTC 1, WTC 2 and WTC 7. The “*slightly cooler*” hot spot in red-orange can be associated with WTC 6. WTC 6 was still burning on September 12 (see above), as was the building at 90 West Street; see the following **photograph and quote**⁵³:

⁵³ From: http://www.pbs.org/americanbuilds/engineering/engineering_buildings_04.html



“90 West Street

DAVE PERAZA: Aircraft parts were found on the roof of this 24-story building, which sustained structural damage on its north face and burned for days after the attack. Nevertheless, the steel-framed structure, a landmarked building designed by Cass Gilbert with heavy terra cotta floors, survived remarkably well.”

The MTI image raises the question how to explain that the building fire in WTC 6 does appear as “slightly cooler” as the collapse piles of WTC 1, WTC 2 and WTC 7 on the image, and it raises the question how to explain that the building fire in building 90 West Street is not visible on the image.

See three still images from a video (from www.history.com) that show parts of Ground Zero (including a part of the footprint area of one tower) on the evening of September 11. The areas where smoke rises are limited. It certainly does not appear as if there would be fires that would burn hotter than building fires.

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A closer look at the timeline of the September 11th attacks on the World Trade Center.

It is very unlikely that any variable smoke layer caused the effect. See the caption of the thermal image “*The smoke is more transparent in the infrared bands ...*” (see above). In addition, two other **images**⁵⁴ that were acquired by the Multispectral Thermal Imager on September 12 show that parts of the very hot ‘yellow’ hot spots from the collapse piles of the former North Tower and WTC 7 are covered with a dark smoke layer:

⁵⁴ From <http://www.lanl.gov/orgs/pa/News/NYCphotos.html>

Infrared Imagery from Space
True Color



Multispectral Thermal Imager



The true color image combines the three red, green, blue bands with spatial resolution of about 5 meters. The 5-meter imagery in the area of the attack is dominated by cover from the smoke.

Infrared Imagery from Space
False Color



Multispectral Thermal Imager



The false color image combines visible and near infrared imagery with spatial resolution of about 5 meters. Areas with vegetation show up as bright red.

Furthermore, another **thermal image**⁵⁵ by MTI (see below) also shows that the smoke layer can only have had limited impact on the visibility in the infrared bands. On this image, that uses other wavelength bands, which pick up ‘cooler’ wave lengths, more hot spots are visible. It is therefore unlikely that any smoke layer caused some of these spots to be less visible or invisible on the above MTI thermal image. Instead, it seems to depend mostly on the temperature of a hot spot for it to appear on a thermal image that picks up certain wavelengths.

⁵⁵ From <http://www.lanl.gov/orgs/pa/News/NYCphotos.html>

Infrared Imagery from Space
Thermal-Visible Image



Multispectral Thermal Imager

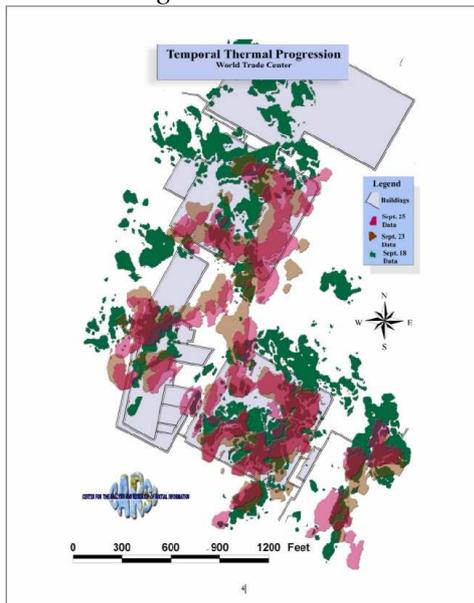


The thermal-visible image is a false color combination of thermal infrared (red) and green and blue. In the thermal infrared hot spots at the former site of the twin towers are visible through the clouds which are otherwise dark in those bands. This imagery has approximately 20-meter resolution.

The MTI thermal images are inconsistent with the assumption that the heat in the collapse piles was caused by fires alone.

(6) The mapping of hot spots by Hunter College New York/ Center for the Analysis and Research of Spatial Information

Quote and map⁵⁶: “Left [here: see below]: *Thermal Imagery of the progression of molten steel hotspots from September 18 to September 25. Notice how the heat becomes concentrated towards the center from the fringe areas. The threshold between color ranges was 1/2 of the energy, so that in a range of 0-255, everything above 127.5 was kept (0-127.5) and everything below was ignored.*”⁵⁷



⁵⁶ This quote with map can be found in: “Mapping Ground Zero”, by Maddalena Romano, in “Geo News” Hunter College, Department of Geography, City University of New York, Volume 15, number 1, October 2001, —p. 1, 3, 4, 5; here: page 4 and 5; <http://www.geo.hunter.cuny.edu/geonews/october2001.pdf>

⁵⁷ Regarding the scaling: See below the quote from “Geo News”, paragraph: *September 16*. The coloured areas identify, for each of the three days, those parts of the surface that are much hotter than all other areas.

Background of this quote and map, **quote**⁵⁸:

“Last spring, Hunter College's Center for the Analysis and Research of Spatial Information, or CARS, introduced the NYC Map, an ortho-rectified photograph of the five boroughs of New York City accurate to within 18 inches. On September 11, the geographers at CARS used this map to aid in the rescue effort at the World Trade Center (WTC) attack site [...]. Jeff Bliss, a research associate at the CARS Lab, gave a timeline of the development, and explained how the visual spectrum, LIDAR (Light Detection and Ranging), and thermal imagery were brought into play to detect areas of possible collapse.

September 11—Researchers began at 7 pm on the day of the attack, assisting the New York City Office of Emergency Management (OEM) by printing 54” by 70” cartographic maps from the NYCMap database. [...] Once completed, these maps were delivered to bunkers at the temporary command center at the policy academy.

[...]

September 16—Thermal imagery measures the progression of underground heat on about a weekly basis. These images are produced in 8-bit grayscale, with brightness levels of 0-255, 0 being the hottest and expressed as pure white. This is known as emissive data, or heat being given off from the structure from underlying hot debris or molten steel. Smoldering is yet undetectable, because potential fires appear cold until they are exposed to air. The first thermal images produced began on September 16, and are repeated on two-day intervals.

I would like to thank Jeff Bliss for the wonderful information and imagery he provided for this story, and acknowledge the 16-20 hours days CARS Lab director Dr. Sean Ahearn has been putting in at the OEM. I would also like to credit Jeff Bliss, Constandinos Theophilides, and Bob Sklar for their tireless analysis. [...]

The scientists who produced the map that is referred to in the “Geo News” Journal as “Thermal Imagery of the progression of molten steel hotspots from September 18 to September 25” cooperated with the management of the rescue operation. See the following quotes for this.

Quote⁵⁹:*“Wednesday 12th September 2001• NY State Office of Technology (OFT) coordinates with Alan Leidner [City of New York, Department of Information, Technology and Telecommunications] and Sean Ahearn (Professor of Geography at Hunter College), to develop a list of remote sensing needs. This includes orthophotography, LIDAR and thermal data.” and “A backup copy of the New York City GIS [Geographic Information System] database [...] is set up as a base map for GIS operations, by Al Leidner and Sean Ahearn, at the temporary Emergency Mapping Center at the NY Police Academy” and “Chief Phiefer and Chief Werner from the New York Fire Department (FDNY) were also frequently at the EMDC [Emergency Mapping and Data Center], gathering imagery for planning purposes.”*

The term “molten steel” is used a second time in the article (“heat being given off from the structure from underlying hot debris or molten steel”). You can at least conclude from the use of this term that the scientists who had access to the raw-data of the thermal images, and who cooperated with persons involved in the management of the rescue operation at Ground Zero, did not see any reason to question the existence of something at the very high temperatures of “molten steel” in the collapse piles.

⁵⁸ Quoted from “Mapping Ground Zero”, by Maddalena Romano, see above.

⁵⁹ Quoted from: “Emergency Response ...”, see above, pages 1 and 5f.

http://imagecatinc.com/reportspubs/wtc_mceer.pdf.

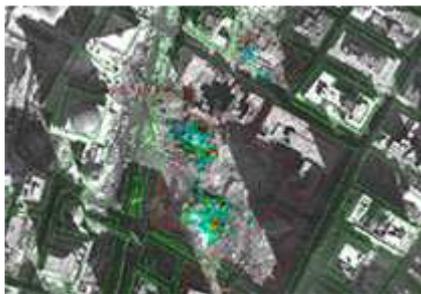
Three more thermal images from CARSI can be found in the public domain (at the Library of Congress⁶⁰). Note, that one part at Ground Zero still appears warmer than ambient temperature on February 12, 2002.⁶¹ **Quote and maps:**

Aerial Views and Maps of the WTC - Thermal Imagery

A thermal sensor flown at 5,000 feet over Ground Zero, provided imagery to track the underground fires that burned for weeks. The hottest areas of the rubble appear in shades of purple. The thermal imagery was overlaid on a map database that shows the footprints of the destroyed buildings in red lines. The standing buildings are indicated by green lines.



[WTC – Thermal Imagery, September 16, 2001.](#) New York State, Office for Technology (c2001) and EarthData International.
[Geography and Map Division](#)



[WTC – Thermal Imagery, October 18, 2001.](#) New York State, Office for Technology (c2001) and EarthData International.
[Geography and Map Division](#)



[WTC – Thermal Imagery, February 12, 2002.](#) New York State, Office for Technology (c2001) and EarthData International.
[Geography and Map Division](#)

⁶⁰ GEOGRAPHY and MAP DIVISION; <http://www.loc.gov/exhibits/911/911-maps.html>; For the same images in higher resolution see <http://www.loc.gov/exhibits/911/911-maps.html>.

⁶¹ See also the quote by chaplain Herb Trimpe, at <http://911research.wtc7.net/wtc/evidence/moltensteel.html>, with regard to this.

(II) Disinformation

Rewriting chemistry

Rewriting chemistry (I): Confusing iron powder and construction steel

The website debunking911.com features a section: “*Molten Steel Explained*” where it is stated, **quote**⁶²:

Conspiracy sites like to bring up molten metal found 6 weeks after the buildings fell to suggest a bomb must have created the effect. The explanation doesn't go into the amount of explosive material needed because it would be an absurd amount. There is another explanation which is more plausible.

Some **quotes/excerpts** from this article:

[Oxidation of iron by air is not the only EXOTHERMIC reaction of iron](#) (= structural steel which is about 98 % Fe, 1 % Mn, 0.2 % C, 0.2 % Si....). There is at least one additional reaction of iron with the capability of keeping the rubble pile hot and cooking!

The reaction between IRON AND STEAM is also very EXOTHERMIC and fast at temperatures above 400 deg C. This reaction produces Fe₃O₄ AND HYDROGEN. It is the classic example of a REVERSIBLE REACTION studied in Chemistry labs at high school. But believe it or not, back at the turn of the century, the reaction of iron and steam was used as an industrial process for the manufacture of hydrogen.

I think iron and steam could have reacted in this way (at least for a while) and generated a lot of heat. What is more, the hydrogen released would have been converted back to water by reaction with oxygen, thereby generating even more heat. In this case spraying water on the rubble pile was like adding fuel to a fire!

[...]

Water vapor was present in the rubble pile and water vapor reacts with iron releasing HYDROGEN.

ITS CALLED A CORROSION REACTION:

METAL + WATER = METAL OXIDE + HYDROGEN

WHEN IT HAPPENED AT THREE MILE ISLAND IT CREATED A HYDROGEN BUBBLE

- NEU-FONZE

[...]

In a vehicle application, the hydrogen is generated by passing water or low-temperature steam over desirably freshly-ground iron, which then becomes iron oxide."

⁶² Quoted from www.debunking911.com/moltensteel.htm. The article by Ferran was posted on debunking911.com at some time between April and August 2006. The website debunking911.com was featured with a link in a widely distributed article by Associated Press (see below). Note, that the statement misrepresents the controlled demolition hypothesis, which ascribes the “molten steel” phenomenon to the use of thermite, but not to a “bomb”.

"The instantaneous grinding of the iron particles in situ is necessitated because iron becomes rapidly oxidized after grinding."

<http://www.freepatentsonline.com/6093501.html>

+ Also: <http://ieeexplore.ieee.org/Xplore/login.js...&isnumber=29811>

Evidently, iron will oxidize about the same rate in air, or in a steam-atmosphere. The addition of water to the piles from the top or pools of it at the bottom thus may have served as an additional source of oxygen, upon combining with hot steel or aluminum.

The article, written by Mark R. Ferran⁶³, features around 82 lines about this “*reaction of iron with the capability of keeping the rubble pile hot and cooking*”. Ferran describes, inter alia, a standard laboratory experiment that is used to demonstrate this reaction. He gives some accounts regarding the commercial use of this reaction for the generation of hydrogen gas, he gives quotes from patents and links to patents, he mentions an actual accident, and he gives reaction equations. In addition, Ferran claims that even more heat will be generated if the hydrogen oxidizes again:

Quote:

The hydrogen generated may have then combined with other materials in the piles, or with oxygen in air, to produce additional heat. (Net thermal result would be same as directly oxidizing iron with oxygen).

The claim by Ferran might appear substantiated to someone who does not have specialized knowledge (either about hot iron and steel, or about chemistry). Ferran seems to provide independent evidence for his claim. Ferran also stresses that all that was required for this “very exothermic” reaction between water and iron was available at Ground Zero anyway. But what Ferran claims does not work. The exothermic reaction between iron and steam does exist, but the crucial factor that needs to be taken into account is whether the iron is a powder (or granule, or very thin foil, or iron wool) that has a relatively high surface to volume ratio, or whether the iron is a large solid form (for example a piece of construction steel, or the iron top of an old fashioned kitchen stove) that has a relatively small surface to volume ratio.

The reactivity of solid substances is influenced by the relative exposed surface area (or surface to volume ratio) of those substances. See the following **quote**⁶⁴ from a chemistry textbook for this:

“12.3 Factors influencing the rate of reaction

[...] *The effect of surface area*

Similarly, with a reaction involving a solid surface, increasing the surface area of the solid increases the number of collisions with the surface [...]

So making a solid reactant in lump form into powder considerably increases the surface area. You only have to compare the effect, for example, of heating aluminium powder in a firework or in a Bunsen flame and heating an aluminium saucepan on a gas cooking ring. [...]”

And, from another chemistry textbook, **quote**⁶⁵:

⁶³ Please note that the New York fire-fighter M. Ferran is a different person.

⁶⁴ Quoted from: “AS and A Level Chemistry” by Eric Lewis and Martyn Berry, Longman, 2000, pages 298f.

⁶⁵ Quoted from “Collins Advanced Science: Chemistry” by Chris Conoley and Phill Hills, 1998, page 594.

“Explaining the effect of increasing the surface area of solid reactants on the rate of reaction

If solid particles are large, they have a small surface area compared to the amount of reactant molecules they contain, and only the reactant molecules at the surface can take part in collision with other molecules. If a solid particle is ground into a fine powder, then many more molecules are available for effective collisions.”

The increase in the surface to volume ratio does increase the surface where collisions between molecules and/or atoms can take place. In addition, the process of grinding consumes energy; the forces by which the particles of a substance are attracted to each other must be overcome. This energy is contained in the powdery substance after the grinding process, with the result that it reacts much more readily. For example, very fine iron powder can ignite spontaneously by itself in air at ambient temperature, but any large solid piece of steel cannot even be ignited if placed in fire.⁶⁶

The rate of reaction can be very slow, even to the point where no reaction occurs, **quote⁶⁷**:

“The description of a reaction as ‘spontaneous’ does not mean that the rate of reaction has to be fast. In fact, the rate of reaction may be so slow that the reaction does not actually take place. In this case, one of the reactants is said to be kinetically stable but energetically unstable.”

And, **quote⁶⁸**: *“A high exothermic energy change could predict that a reaction is possible, i.e. the system is thermodynamically unstable. But if the rate of reaction is too slow there will be no obvious chemical change, i.e. it is kinetically stable.”*

Ferran provides four websites as references to support his claim. However, it is consistent with the above mentioned that none of those references describes a reaction of a large solid form of iron. In the three references, where it is specified, iron with a relatively large exposed surface area is used. In the first reference a reaction based on a mixture of molten iron and tin is described. The molten metals are whirled in high turbulence in a special reactor. Such whirling movement results in a relative large surface area⁶⁹ and in volatile particles that readily react. Note that the historical commercial process (to which Ferran refers explicitly in his article) used “*iron particles*” according to this reference provided by Ferran, **quote⁷⁰**:

“The HydroMax technology is a two-step process. First, steam contacts a molten metal to form metal oxide and produce hydrogen. [...]

The hydrogen production step is the same chemical reaction that occurs in the steam-iron process which was used to produce hydrogen commercially 100 years ago. In that technology steam was passed over iron particles to produce hydrogen and iron oxide.”

⁶⁶ For the reasons for the dependence of the reactivity on the relative surface area in solids as well as in liquids see: “Lehrbuch der Anorganischen Chemie“, begründet von A. F. Hollemann, fortgeführt von Egon Wiberg, 91.-100., verbesserte und stark erweiterte Auflage von Nils Wiberg, Walter de Gruyter, Berlin, New York 1985; pages 885ff. For the self-igniting iron powder see below.

⁶⁷ Quoted from “Collins Advanced Science: Chemistry”, see above, page 572.

⁶⁸ Quoted from: “AS and A Level Chemistry”, see above, page 293.

⁶⁹ See “Lehrbuch der Anorganischen Chemie“, see above, pages 885f about the increase of surface areas in liquids.

⁷⁰ Quoted from „<http://www.alchemix.us/TechnologyDescriptionweb710.pdf>“.

And, **quote**⁷¹:

“Contact is further enhanced by injecting steam into the metal bath at roughly 500 miles per hour which creates high turbulence and smaller particles of iron which increases available surface area which enhances contact.”

In the second and third references reactions are described where solid iron with a relatively large surface area (either iron powder, or iron wool) reacts:

Quote⁷²: *“Let me show you another reaction involving water and a metal. This time the metal is common iron in the form of iron wool.”*

Quote⁷³: *“An improved fuel cell system that utilizes hydrogen and air. The hydrogen of the fuel cell is derived from a hydrogen-generating process wherein H₂ O is passed over a bed of iron material. The hydrogen generating process uses a catalyst, or freshly-ground iron material, or both, and generates the hydrogen for the fuel cell in situ at lower-than-normal temperatures when the H₂ O reacts with the iron material.*

The low-temperature process of this invention is made possible by catalyzing the reaction, by utilizing freshly-ground particles that increase the efficiency of the iron, or both, so that the iron is able to enter into the water/iron reaction at lower-than-normal temperatures.

The iron particles are ground when the vehicle is initially powered and during hydrogen generation. The instantaneous grinding of the iron particles in situ is necessitated because iron becomes rapidly oxidized after grinding. Fifteen minutes after grinding, iron will lose its enhanced reactivity. Therefore, after the initial grinding, the grinding process should continue. [...] The particles range in diameter size from approximately 25 to 1,200 μm; an average-sized distribution is one in which at least 20% of the particles are less than 300 μm in diameter. It is preferable that at least 50% are less than 300 μm in diameter.”

The fourth website to which Ferran refers provides only limited information⁷⁴.

Only a reaction on a very small scale, or no reaction at all, occurs if any large hot solid forms of iron or steel (such as construction steel) are in contact with water or steam. This can be concluded from the following two quotes.

Quote [in excerpts]⁷⁵: **MATERIAL SAFETY DATA SHEET**

PRODUCT IDENTIFICATION

⁷¹ Quoted from

<http://web.archive.org/web/20050819071910/www.alchemix.us/index.php?module=ContentExpress&func=display&bid=18&btile=Navigation&mid=10&ceid=2>.

⁷² Quoted by Ferran from <http://www.woodrow.org/teachers/ci/faraday/lab3.html>

⁷³ Quoted from: <http://www.freepatentsonline.com/6093501.html>, Note that the process that uses a catalyst would use iron powder as well.

⁷⁴ The link http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?tp=&arnumber=1359020&isnumber=29811 directs to the abstract of the article “Hydrogen: automotive fuel of the future” by T-Raissi, A. and Block, D.L. from the Florida Solar Energy Center. The article itself is available for subscription or pay per view only. However, in other articles by these authors (e.g., at

http://www.fsec.ucf.edu/en/research/hydrogen/analysis/documents/FY03_TechnoeconomicFinal.pdf) hydrogen production is discussed that uses either sub-quality natural gas, or ammonia (NH₃), or water (by using so-called *thermochemical circles for splitting water*), but no reaction is mentioned based on large solid forms of iron.

⁷⁵ Quoted from <http://www.espi-metals.com/msds/s/iron.htm>. This is not a textbook but the company that published the material safety data sheet is “specializing in the fabrication of high purity metals, alloys, and compounds”, and they mention customers like Los Alamos National Laboratory, Department of Energy, MIT, Boeing etc. It is therefore likely that the product information contains proven facts only.

The reference provided by Ferran “*WHEN IT HAPPENED AT THREE MILE ISLAND IT CREATED A HYDROGEN BUBBLE- NEU-FONZE*” refers to a reaction of hot metal with steam that created in fact lots of hydrogen. However, it refers to a very special reaction under very special conditions, **quote** [in excerpts]⁷⁷:

Now the situation went from bad to worse. About 100 minutes after the accident started, steam bubbles appeared in the coolant pumps, causing them to vibrate. Fearing a complete failure of these pumps, the operators turned them off. With no water flowing into the reactor and water and steam escaping the reactor, large portions of the reactor core became uncovered. With no water to remove the heat, the fuel pellets started to melt, resulting in a partial meltdown.

[...]

While the reactor core was melting, the hot zirconium (that held the fuel) was reacting with the water. This chemical reaction produced hydrogen gas, which is combustible. Some of the hydrogen gas escaped from the reactor and into the containment building.

The hydrogen releasing reaction, Ferran refers to, happened during the partial melt down of a fission reactor core, and the metal that reacted with the steam was not iron but zirconium. This reference is useful in a discussion of the reactions of zirconium, but not to discuss the reactions of steel.

Ferran quotes one patent: “*The instantaneous grinding of the iron particles in situ is necessitated because iron becomes rapidly oxidized after grinding.*”, then he claims: “*Evidently, iron will oxidize about the same rate in air, or in a steam-atmosphere.*” Ferran missed one crucial word in his claim: ground. Only ground *iron will oxidize about the same rate in air, or in a steam-atmosphere*, but not construction steel. His explanation for the exceptionally high temperatures in the collapse piles is invalid. In addition, if any higher amounts of hydrogen had been released into the collapse piles it would have been noticed (see Rewriting science).

Rewriting chemistry (II): “Iron Burns!!!”

Ferran states at the start of the article that was discussed above, **quote**:

Before reading the below, it might be a good idea for the novice to read Mark Ferran's explanation on how “Iron Burns!!!”

Some **quotes/excerpts** from “*Iron Burns!!!*”⁷⁸:

“*Not only does it [iron] burn/oxidize, but it can burn/oxidize at low temperatures.*”
[...]

⁷⁷ Quoted from the website ThreeMileIsland.org by Dickinson College:

Dickinson College's Three Mile Island web site is made up of a variety of documents related to the nuclear emergency that occurred at the Three Mile Island nuclear power plant in March of 1979.

Section “science”/“What went wrong?” http://www.threemileisland.org/science/what_went_wrong/index.html

⁷⁸ All above quoted from: www.debunking911.com/ironburns.htm, posted on debunking911.com at some time between April and August 2006.

The Truth is that: HOT STEEL WILL CONTINUE TO UNDERGO EXOTHERMIC OXIDATION REACTIONS WHILE EXPOSED TO AIR, CAUSING IRON TO INCREASE ITS TEMPERATURE UNTIL IT MELTS, FORMING POOLS OF MOLTEN IRON.

[...]

For perspective, I found this children's educational webpage that further illustrates that "

[...]

he ignores the scientifically provable (or disprovable) fact that iron metal itself burns, and that when amassed in large piles can ignite fires (and can even melt itself). The article discusses child-safe experiments observing a very slow oxidation of iron (rusting at room temperature), but also mentions:

"Sometimes a big load of iron in a ship can get hot. The heat can even set other materials on fire. That's because the iron is rusting, which means it is burning very, very slowly. Iron rusts in a chemical reaction called *oxidation*. That means the iron reacts with oxygen gas from the air. Oxidation is the chemical reaction that occurs when anything burns in air. Like most oxidations, rusting gives off heat."

[...]

Beyond the scope of this child-oriented article, it is important to understand that general rule in chemistry that most chemical reactions (e.g., oxidation of iron) are accelerated by higher temperatures. This is especially true of iron oxidation. This means, that the hotter iron metal in contact with oxygen is, the faster it will oxidize (burn). For example, it is a familiar sight at iron foundries to see hot iron rust forming instantaneously on red-hot iron beams. This hot rust usually falls off spontaneously (because of the difference in thermal expansion properties between iron and rust). Meaning, a hot iron beam, if combined with a large enough number of other hot iron beams in a confined or semi insulated pile (e.g., covered with cement dust), will burn CONTINUOUSLY until it consumes itself,

[...]

Also of note: Faraday's lectures and a demonstration of iron powder burning incandescent in air (and more brightly in pure oxygen):
<http://www.fordham.edu/HALSALL/MOD/1859Faraday-forces.html>
(*"Michael Faraday was the son of a blacksmith, and was born at Newington Butts, near London, September 22, 1791."*)

A WWII witness in Germany recounts seeing the "iron" of three Russian tanks "burn" from March 9, 1945 until November 3, 1945: <http://members.tripod.com/~radde/RaddesFlight.html> ("The three Russian tanks before Bresin still burned as we passed by them on the morning of 11-3, and this taught me something surprising: iron burns.") This account suggests that the "critical mass" of iron metal that will sustain itself burning hot may be quite small compared to the huge amounts of iron debris the WTC piles. This account of prolonged iron combustion also supports the conclusion that the main source of high heat in the piles of the WTC 1, 2 and 7, weeks and months after their collapse, was due to burning iron in these piles. This conclusion could be readily verified or disproved through simulation or experimentation.

[...]

Theoretically, there is no limit upon the temperature that such a large air-metal-fire could attain. It could, in theory, attain a temperature high enough to not only melt iron, but also to boil (vaporize) iron, but not at the same location at the same time.

[...]

While a mixture of aluminum and (oxygen and iron) (e.g., rust) called "Thermite" is capable of producing molten iron, evidently, a combination of metallic Iron and Oxygen (or Carbon Monoxide) is itself capable of melting iron in a large pile furnace. Large piles of pure iron dust are capable of "burning" themselves into a molten mass solely due to the heat of combustion of the iron itself. **Iron itself is a combustible material** (and is commonly used in powder form to warm hands and feet in little packs sold at Wal-Mart etc., and in MREs).

[...]

For practical purposes, all this means that a huge pile of iron beams (e.g., mixed in with tons of other materials initially burning) can itself begin to burn like huge iron logs in a pile furnace, and there is no reason not to expect this system to reach a temperature high enough to melt iron.

In his 36 page article "*Iron Burns!!!*" Ferran confuses different oxidation processes, and he confuses powder and large solid forms in regard to their abilities to react, and he confuses the reactivity of so-called pyrophor iron, which must be produced in a special process, with the reactivity of normal steel.

The confused processes one by one:

(1) Rusting of iron

The heat energy released by rusting is released only over a long period of time, because the reaction is relatively slow (compared to the time that is needed, for example, to burn coal in a furnace). This is even stated in the reference provided by Ferran. The **quote**⁷⁹ from Ferran's reference is here quoted with two additional sentences: "*Sometimes a big load of iron in a ship can get hot. The heat can even set other materials on fire. That's because the iron is rusting, which means it is burning very, very slowly. Iron rusts in a chemical reaction called*

⁷⁹ Quoted from: http://www.highlightskids.com/Science/TryThis/h3TT1004_ironBurns.asp?subTitleID=159. The ignition temperature of newspapers is about 175°Celsius.

oxidation. *That means the iron reacts with oxygen gas from the air. Oxidation is the chemical reaction that occurs when anything burns in air. Like most oxidations, rusting gives off heat. But rusting is a slow process that gives off very little heat. It becomes a fire hazard only when a lot of iron is allowed to rust in a closed-up space.*"

So how will you melt steel beams at about 1500°Celsius by “*a slow process that gives off very little heat*”? Ferran seems to expect that some objections might be raised in this regard and offers the following solution: “*Beyond the scope of this child-oriented article, it is important to understand that general rule in chemistry that most chemical reactions (e.g., oxidation of iron) are accelerated by higher temperatures. This is especially true of iron oxidation. This means, that the hotter iron metal in contact with oxygen is, the faster it will oxidize (burn).*”⁸⁰

However, you will find in textbooks that deal with the subject “rusting” that, **quote:** “*Rusting requires the presence of both oxygen and liquid water. Water vapour is not enough.*”⁸¹

Liquid water (it can be tiny drops) must form with the iron surface a kind of battery (an electrochemical cell) at the start of the rusting process⁸². If it is too hot to have any liquid water on the surface of the steel (say at about 100°Celsius at normal atmospheric pressure) rusting cannot be “*accelerated by higher temperatures*”. That rusting cannot have melted steel at Ground Zero conforms to daily life experience: rusty cars and big piles of steel in scrap yards do not turn into pools of molten steel.

(2) Pyrophore iron powder that oxidizes at room temperature / very fine iron powder

You can produce a special form of iron by reduction of iron-(III)- hydroxide with hydrogen. The reduction process must happen at temperatures of about 300°Celsius. Such a so-called “pyrophore iron” powder will oxidize accompanied by light emissions at room-temperature. This phenomenon is due to the fact that the special production process causes an unusual lattice structure that conserves energy.⁸³

Very fine powder of ‘normal’ (non pyrophore) iron shows a similar but less intense reactivity. This is based on the above mentioned fact that an increase in the relative surface area, for example by grinding, increases the surface area where reactions can take place, and it increases the energy that is contained in the solid substance. See the following quote from a fact sheet for iron powder in regard to this:

Quote, excerpts⁸⁴:

„*Eisen, Pulver* [iron, powder]

[...] *Leichtentzündlicher Feststoff*. [~Easy to ignite solid.]

Kann durch kurzzeitige Einwirkung einer Zündquelle leicht entzündet werden und brennt nach deren Entfernung weiter. [~ Can be ignited by short exposure to an ignition source and will continue to burn when the ignition source is removed.]

⁸⁰ Quoted from the article “*Iron Burns!!!*”

⁸¹ Here quoted from “AS and A Level Chemistry” by Eric Lewis and Martyn Berry, Longman, 2000, page 670.

⁸² Reference: see chemistry textbooks (e.g. “AS and A Level Chemistry”, see above, pages 629f and 670f).

⁸³ Source: “Lehrbuch der Anorganische Chemie“, begründet von A. F. Hollemann, see above, page 888f. Iron powder that is produced by reduction of iron-(III) hydroxide at 600°Celsius will show this effect too, but only at about 300°Celsius.

⁸⁴ Quoted from <http://www.hvbg.de/d/bia/gestis/stoffdb/index.html>. The quoted fact sheet is provided by a German institute for maintenance of industrial health and safety standards that works in cooperation with a German public body. The translations provided in brackets might not be perfect but gives the gist.

Die Entzündungsgefahr ist umso größer, je feiner der Stoff verteilt ist. [~ Danger of ignition increases the finer the powder is dispersed.]

Sehr feines Pulver: Kann sich bei Raumtemperatur an der Luft ohne Energiezufuhr erhitzen und schließlich entzünden. [~ Very fine powder: in air at room temperature it can become hot without any supply of energy and eventually ignite by itself.]

Die Zündbereitschaft hängt u.a. sehr stark von der Korngröße und dem Verteilungsgrad ab. [~ Whether the powder ignites is very dependent on the grain size and on the degree of dispersion.]

Das Metall in kompakter Form ist nicht brennbar. [~ This metal in its compact form is not combustible.]”

It is safe to assume that any steel in the collapse piles was made from iron that was produced in a blast furnace but not by a reduction of iron-(III)-hydroxide with hydrogen at 300°Celsius. Furthermore, the steel in the collapse piles was not a powder or a very fine powder but it was in large solid forms.

(3) Scale formation on the surface area of iron at high temperatures

The effect of scale formation is common in steel processing plants. The forming surface layer of iron oxides and maybe of some other substances is called “scale” or “millscale”. It is not rust, and it is not called “rust”. Scale formation is mentioned in the metallurgical literature and in encyclopaedias. Some problems in regard to scale formation can be found discussed in the literature, for example, how to avoid scale formation and how to remove scales⁸⁵. But there was no mention in the consulted literature that scale formation would melt the work piece. Furthermore, not even the heat released by scale formation was discussed. This means that the heat that is released by scale formation is not of concern during the production process of steel and iron products. In addition, if steel or iron were to melt due to the heat released by scale formation any shaping process at high temperatures (like rolling, forging and casting) would be severely affected.

Photographs of scales on WTC steel demonstrate that scale formation on WTC steel did not result in pools of molten steel but in steel parts with scales⁸⁶:

⁸⁵ See, e.g., “Hot strip” and “Pickling” in the article “steel” *Encyclopædia Britannica*. 2007. Encyclopædia Britannica Online. 24 2007 <http://www.britannica.com/eb/article-9110660>. Two examples for the discussion of problems due to scale formation: **Quote:** “As the scale becomes more voluminous cracking and spilling often occurs with consequent increase in rate of oxidation. When an oxide adheres tightly to a metal there is usually a well-defined atomic relation-ship between the oxide and the underlying metal grain. The scale is often multi-layered, containing different oxides, for example iron oxidised at 1000°C has scale layers:[...]” Quoted from: “Metallurgy for Engineers” by E. C. Rollason, first published in Britain 1939, fourth edition 1973, reprinted 1992, London, New York ...; page 149.

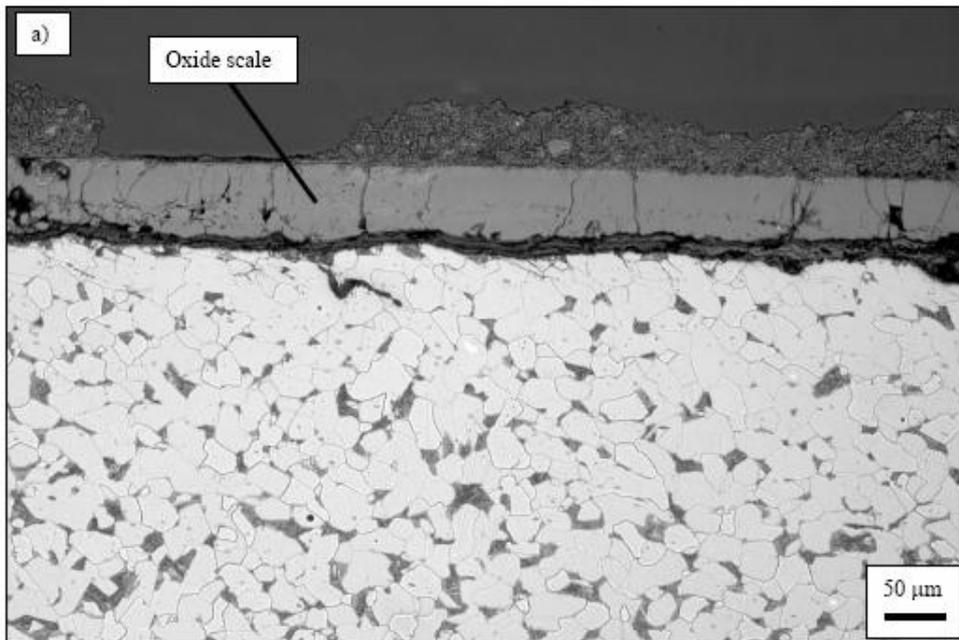
Quote: “Scale pits with grain boundary oxidation - 1.4303

Because of unfavourable parameter during the solution annealing, too high temperature or too long holding time, strong scale layers can be formed. This scale layer is partly accompanied by stronger formation of scars. Unless by wrongly selected annealing parameters, a furnace disturbance yields the same defect picture. By influence of oxygen at increased temperatures metals (steel in this case) can form oxidic layers on the surface. These are described as a scale. Grain boundary oxidation is a type of the scaling hurrying on ahead at the grain boundaries.” Quoted from the website: “Information about steel for metallographer”,

<http://www.metallograf.de/start-eng.htm>.

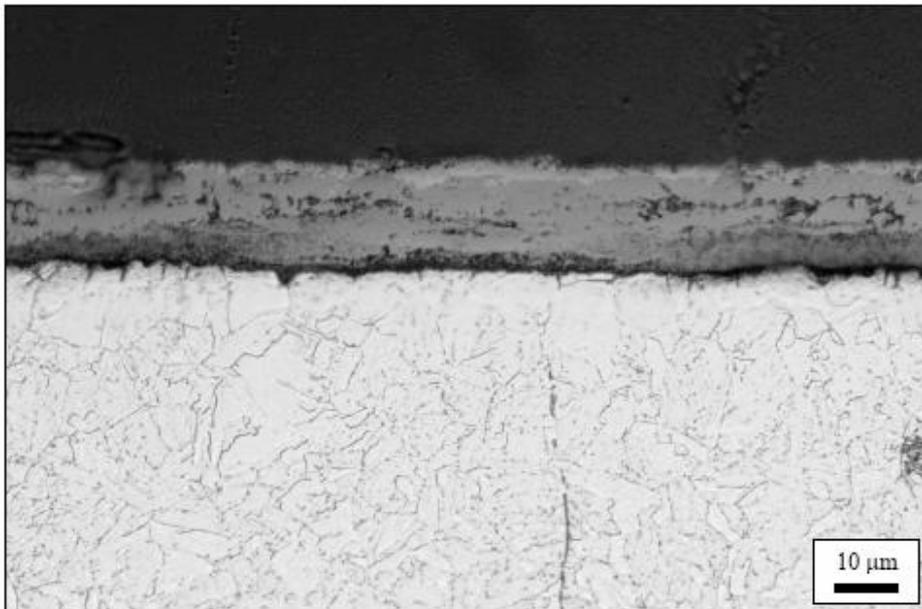
Partial remelting of castings in the mould is discussed in the book “Castings”. The only reason given for such remelting are changed heat flows in the casting but not any scale formation despite the fact that formation of oxide layers and their effects on the quality of the casting are widely discussed in this book. See “Castings”, by John Campbell, first published 1991, second edition 2003, reprinted 2004, Elsevier, Oxford, page 129.

⁸⁶ First photograph and caption from NIST, NISTNCSTAR1-3Cchaps, page 247 (showing a scale developed by fire exposure in the WTC or at Ground Zero). Second photograph and caption from NISTNCSTAR1-3Cchaps, page 234 (showing a scale developed in a furnace in a test by NIST)



Source: NIST.

Figure 6–12. Light optical micrographs of the microstructure of a perimeter floor truss seat from the 99th floor of WTC 1, panel N-8 (A142: 97-100). a) Ferrite-pearlite microstructure and developed oxide scale. Two percent nital and 4 percent picral etch.



Source: NIST.

Figure 6–8. Iron oxide scale that developed on a 100 ksi quenched-and-tempered flange plate after isothermal exposure at 625 °C for 2 h. Sample was from panel C-10 (WTC 1, column 451, 88th floor). Two percent nital and 4 percent picral etch.

(4) Combustion of iron

The encyclopaedia Britannica gives the following definition for the term “combustion”,

quote⁸⁷: “*Combustion and flame*

Combustion is a chemical reaction between substances, usually including oxygen and usually accompanied by the generation of heat and light in the form of flame. The rate or speed at which the reactants combine is high, in part because of the nature of the chemical reaction itself and in part because more energy is generated than can escape into the surrounding medium, with the result that the temperature of the reactants is raised to accelerate the reaction even more. [...] In general terms, combustion is one of the most important of chemical reactions and may be considered a culminating step in the oxidation of certain kinds of substances. Though oxidation was once considered to be simply the combination of oxygen with any compound or element, the meaning of the word has been expanded to include any reaction in which atoms lose electrons, thereby becoming oxidized. As has been pointed out, in any oxidation process the oxidizer takes electrons from the oxidizable substance, thereby itself becoming reduced (gaining electrons). Any substance at all can be an oxidizing agent. But these definitions, clear enough when applied to atomic structure to explain chemical reactions, are not as clearly applicable to combustion, which remains, generally speaking, a type of chemical reaction involving oxygen as the oxidizing agent but complicated by the fact that the process includes other kinds of reactions as well, and by the fact that it proceeds at an unusually fast pace.”

If steel beams would burn “*like huge iron logs in a pile furnace*” this would mean that such steel beams would actually combust. But in none of the chemistry textbooks consulted and in none of the metallurgy books consulted was the question discussed whether iron can burn “*like huge iron logs in a pile furnace*”. Nor was it stated at what temperature large solid forms of iron will combust. You can find statements in regard to the question whether or not iron combusts on material safety data sheets or at some web pages of fire departments. Here you will find stated that large solid forms of iron will not combust⁸⁸. You can conclude from those statements that construction steel will not start to combust in any kind of fire that fire fighters might have to face.

According to the literature NASA established flammability data for iron that burns at high pressure in pure or almost pure oxygen, **quote**⁸⁹:

Although the three metals considered, Fe, Co, and Ni, are Group VIIIA in the first transition series of the periodic table and they have similar properties as shown in Tables 1 and 4, and react with oxygen, the nature of their burning in oxygen as observed in standard NASA/ASTM flammability tests are significantly different. This difference is emphasized by consideration of the reported threshold pressures for these metals as shown in Table 5 [22].]

[...]

⁸⁷ Quoted from: " **oxidation–reduction reaction** ." Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 2 2007 <http://www.britannica.com/eb/article-49305>.

⁸⁸ See the above quote/excerpt from the German material safety data sheet (in Rewriting chemistry I) as an example.

⁸⁹ Quoted from “The Presence of Excess Oxygen in Burning Metallic Materials” by Wilson DB, Steinberg TA, DeWit JR, in Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Ninth Volume, Theodore Aaron Steinberg, B. E. Newton, Harold Deck Beeson, Published: 2000, pages 145 - 162.

Table 5. Reported Threshold Pressures for Iron, Cobalt and Nickel Burned in Oxygen as 0.32-cm Diameter Rods.

Metal	Threshold Pressure (kPa)
iron (Fe)	500
cobalt (Co)	> 69,000
nickel (Ni)	> 69,000

[...]

Iron is considered flammable at oxygen pressures ≥ 500 kPa (Table 5).

In other words: you can have 0,32 cm diameter “*iron logs in a pile furnace*” if the pile is placed in a pure oxygen atmosphere at about five times the standard atmospheric pressure. The reaction has to be started with a suitable igniter (for example with a “Pyrofuse™”). There was no pure oxygen at Ground Zero, there was no suitable igniter, and most of the steel was not in tiny rods⁹⁰.

Ferran does not cite any textbook that states a temperature at which iron will burn like *logs in a furnace*. Instead, he provides the following quotes containing temperature data that the reader of “*Iron Burns!!!*” may interpret as references regarding combustion of iron:

Quote⁹¹:

19th Century:

"Iron commences to 'burn' at 2500[F], while at the end of the operation in the Bessemer process, when the temperature reaches some 3000[F], the iron burns violently, as demonstrated by examination of the Bessemer flame with the spectro- scope. (See p. 46, Vol. II.)"

[http://memory.loc.gov/cgi-bin/query/r?ammem/hcps:@field\(DOCID+@lit\(ABS1821-0003-230\)\)](http://memory.loc.gov/cgi-bin/query/r?ammem/hcps:@field(DOCID+@lit(ABS1821-0003-230))):

Manufacturer and builder / Volume 3, Issue 6, June 1871

"At 1000C iron burns as easily as wood." <http://www.learning-org.com/01.09/0073.html>

Iron smiths (Blacksmiths) modern and ancient are aware that glowing Iron Burns:

"With bellows blowing additional air through the fire, it can reach temperatures of about 3,000° Fahrenheit. Iron burns at 2,800°, however, so the smith has to be careful to not ruin his work! ... The smith's fire contains too much oxygen to allow iron to melt; as it approaches its melting point the iron burns instead."

<http://www.osv.org/cgi-bin/CreatePDF.php?/tour/index.php?L=12&PDF=Y>

⁹⁰ An article refers to an experiment that a tiny iron rod burned in pure oxygen at normal atmospheric pressure. So the high pressure that is suggested by the NASA data is here not named as a prerequisite.

⁹¹ Quoted from: debunking911.com, article “*Iron Burns!!!*”

The "At 1000C iron burns as easily as wood." statement is not based on any chemistry, metallurgy or combustion science dedicated website, but it is contained in an unedited email by someone who is reflecting on 9-11 in September 2001. The website that posted this email describes itself as "an internet dialog among people interested in the Learning Organization concept, as described by Peter M. Senge in *The Fifth Discipline*, (1990, New York, Currency Doubleday). [...] It is a flow of messages over the internet. [...] To add your contribution to the flow, you send a simple e-mail message to our address and the robot takes care of everything else."⁹² The 1000°Celsius data cannot be right, it is even in contradiction to the other quotations provided in "Iron Burns!!!", and the making of steel and iron products in the usually way would be impossible if iron burnt at 1000°Celsius.

The temperatures given in the other quotes provided in "Iron Burns!!!" are much higher, 2500°Fahrenheit, 2800°Fahrenheit, and 3000°Fahrenheit (between 1371⁰ Celsius and 1649⁰ Celsius). As steel melts at about 2800°Fahrenheit it makes no sense to refer to the possibility that iron might burn at this temperature (and at a higher temperature) in order to give evidence that burning iron melted steel at Ground Zero. The 2500°Fahrenheit data applies to the carbon rich molten iron⁹³ at the start of the Bessemer process but not to solid construction steel. In the Bessemer process molten iron is converted into steel by adding oxygen to the charge. However, even if you can observe "violently burning" during the Bessemer process this proves exactly the opposite of what Ferran claims: not even the molten iron/steel with added oxygen will start to combust in a self sustaining process⁹⁴. Other processes, for example the cutting of steel with an oxyhydrogen-torch⁹⁵, steel on the hot strip of an iron foundry, or the bloomery process⁹⁶ are also proof that iron or steel cannot be ignited in normal air.

To summarize: Rusting will release heat only very slowly and stops for certain if it is too hot for water to remain liquid. Scale formation on steel pieces will not cause the steel pieces to melt. The iron at Ground Zero was in steel beams and steel parts that were large solid forms, but there were no piles of iron powder at Ground Zero, neither piles of normal iron powder, nor piles of pyrophore iron powder. The steel at Ground Zero did not burn like "huge iron logs in a pile furnace". There is no possibility that "burning iron" can account for the high temperatures and the persistent heat at Ground Zero, and there is no possibility that any "burning iron" produced molten steel at Ground Zero.

Rewriting chemistry as disinformation

It happens that mistakes are made in science; even textbooks may contain some mistakes. So Ferran might have got it wrong unintentionally. But there are several reasons to suspect the opposite. M. Ferran *BSEE scl JD mcl* describes himself as an "engineer of high academic

⁹² Quoted from <http://www.learning-org.com/LOinfo.html#topics> ; if the web-address given in "Iron Burns!!!" will not work, you can go to www.learning.org , click [Learning Org Discussion Pages](#) and you can find it between the September 2001 messages: "[Reflections on September 11 LO27277 AM de Lange \(09/25/01\)](#)".

⁹³ See below, Appendix M/metallurgy for the dependence of the melting point of iron on the carbon content. See encyclopedias or metallurgy books for the Bessemer process.

⁹⁴ After the carbon is oxidized the excess oxygen oxidizes iron from the charge. Therefore you have the "violently burning" at the end of the process. It might be the case that the term 'auto-oxidation of volatile iron particles' was more appropriate. Conspicuously, Ferran added inverted commas around the word "burn" with respect to the 2500°Fahrenheit data. The original text from the 19th Century does not have them.

⁹⁵ *In Oxy-fuel cutting, a cutting torch is used to heat up ferrous metal to kindling temperature (about 980°C). A stream of pure oxygen is trained on the hot metal which chemically combines with the iron which then flows out of the cut, or kerf, as an iron-oxide slag* http://en.wikipedia.org/wiki/Oxy-fuel_welding_and_cutting

⁹⁶ See below, Rewriting metallurgy, for the bloomery furnace.

achievement”⁹⁷ and he provides in his article “*Iron Burns!!!*” a link to his own website on which you can find another link to an older newspaper article about a bright teenager Mark Ferran who does a lot of scientific experiments by himself⁹⁸. It is hard to believe that such a person really thinks that rusting can melt steel in collapse piles, or that different oxidizing reactions can be mixed up in their requirements and outcomes.

You can conclude that Ferran knows the relevant chemical principles when you consider the email exchange that is published at the end of the “*Iron Burns!!!*” article. Ferran tries hard not to answer clear-cut questions with clear answers. However, his emails prove that he can distinguish at least three of the different oxidation processes that he confuses in “*Iron Burns!!!*”, **quote**⁹⁹:

So, "oxidation" is the proper terminology to describe both slow oxidation (rusting) and medium oxidation (hot, but sub-ignition) and very fast oxidation (ignition with incandescence).

And similar, **quote**¹⁰⁰:

It is an immaterial and unnecessary semantical debate whether all "oxidation" including very slow oxidation (e.g., rusting) is "burning." I do not believe that the acceptable usages of "burning" necessarily requires that the rate of oxidation "is sufficiently high to transform the oxidizing material into a gaseous state."

And, **quote**:

Let us use the word "oxidizes" instead of burns. "Burns" is not a precise term. "Burning may be a slow oxidation like that which occurs when a iron rusts, or it may occur quickly in a very fast oxidation ..."
<http://www.newton.dep.anl.gov/askasci/chem03/chem03035.htm>

So it is deliberate that Ferran makes a lot of effort to cause confusion based on the terms “oxidation” and “burning”.

Ferran is also well aware of the impact of the relative surface area, **quote**:

If you somehow shave off a razor-thin slice of a red-hot block of iron, (the only thing changed being the ratio of mass to surface area of the shaving) the shaved slice will likely ignite and incandesce just like burning "steel wool" because of the change of the mass associated with its reactive surface area (also doubling the surface area).

So it is deliberate that the influence of the relative surface area is not considered.

Furthermore, at links that are given by Ferran to prove his case, you can find statements that do not support his claim (see the example with the rusting on the ship). Ferran quotes selectively what supports his case but leaves out anything that is contrary to his claims.

⁹⁷ Quoted from “*Iron Burns!!!*”.

⁹⁸ www.billstclair.com/ferran/bio.html

⁹⁹ Quoted from “*Iron Burns!!!*”.

¹⁰⁰ Quoted from “*Iron Burns!!!*”.

Conspicuously, Ferran discusses detailed problems that might be irrelevant¹⁰¹ but he fails to mention the details that matter (like the difference in the reactivity between construction steel and iron powder). However, some of the irrelevant problems discussed by him reveal his knowledge of chemistry.

Finally, how can an engineer seriously refer to the reactivity of zirconium in a fission reactor core in melt down to discuss the chemical behaviour of hot steel in a collapse pile?

The chemistry that is confused by Ferran is basic rather than highly specialized knowledge. So why does he think his articles are worth the effort and might ‘work’ in the sense of debunking911.com? Ferran provides an answer. He writes in “*Iron Burns!!!*” that he was [quote:]

aware that there are millions of science-ignorant people and some total morons walking around America babbling about the World Trade Center [...]

Of course, there is a good chance that it is possible to deceive “*science-ignorant people*” successfully with tweaked ‘chemistry’.

Only some of the faulty claims in “*Iron Burns!!!*” can be falsified relatively easily. That rusting needs liquid water is regularly explained in textbooks. Other claims from “*Iron Burns!!!*”, and the claim from Ferran’s other article are not easy to contest without much expenditure of time unless you have specialized knowledge. For example, if you consult a chemistry textbook it might prove difficult to find out why the hydrogen releasing reaction will not keep “*the rubble pile hot and cooking*”. With some likelihood you will turn in the textbook to the chapter about the reactions of iron. You might find there (if the chemistry book is detailed enough) that the exothermic reaction between hot iron and water/steam does indeed exist. But the crucial fact, that this reaction works reasonably well only if the iron has a relatively large surface area will most likely not be explained in a chapter about reactions of iron. The influence of the surface area is explained in many textbooks in a separated general chapter about the rate of reactions and the general role of the surface area, and the examples used are normally dust-explosions but not the reactions of iron. Therefore, a brief look in a chemistry book might give the impression that Ferran’s claim was right.

¹⁰¹ For example: “It is irrelevant whether or not the steam was wet or dry, that is a chemical engineering notion only of interest in a closed and controlled system, usually under high-pressure, such as a steam generator in a power station.”

Rewriting metallurgy

NIST appears to claim that steel might have melted at Ground Zero, quote¹⁰²:

Under certain circumstances it is conceivable for some of the steel in the wreckage to have melted after the buildings collapsed.

At debunking911.com/ article “Iron Burns!!!” it is repeatedly claimed and suggested that the steel at Ground Zero might have melted due to combustion. See, for example, the following quote¹⁰³:

As we all know, the debris field of the WTC was an oven of steel-melting intensity.

And, quote¹⁰⁴:

Even ordinary dry WOOD (charcoal) in a large enough furnace, is capable of melting iron:

<http://www.uky.edu/KGS/geoky/fieldtrip/BigSinking/Furnace/furnace.htm>

The argument that steel might have melted at Ground Zero is often countered with the statement, that fire does not burn hot enough to melt steel. This statement does not enable someone who does not have specialized knowledge to decide which claim might be correct: Firstly, the argument “fire melted steel in the collapse piles” is often combined with a reference to special conditions in the collapse piles (see NIST’s “*certain circumstances*”). Secondly, although many people will know that their iron barbecue does not melt in fire they will know as well that iron and steel have been melted commercially by the use of fire that burns hot enough to melt iron or steel.

The metallurgy and chemistry books and encyclopaedias consulted do not give any direct statements that were suitable to verify or falsify NIST’s suggestion and debunking911.com’s claim directly. Melting steel in piles is not discussed in the consulted literature. However, some sophisticated furnace-based technologies used in iron metallurgy are explained. These technologies will be presented below regarding their requirements and outcomes. Only some of these furnace technologies are capable of melting steel, while others are not. From a comparison of them it is possible to deduce the basic requirements (such as quality of fuel, etc.) that are needed to melt steel with fire. These basic requirements will be compared with the supply of combustibles and of oxygen in the collapse piles. In addition, heat release rates of burning office contents assessed by NIST are considered. You can conclude that the suggestion that steel might have melted in the WTC collapse piles is inconsistent with any experience the discipline of iron metallurgy can offer regarding furnace technologies, and that it is inconsistent with the heat release tests carried out by NIST itself.

¹⁰² Quoted from the fact sheet “National Institute of Standards and Technology (NIST) Federal Building and Fire Safety Investigation of the World Trade Center Disaster Answers to Frequently Asked Questions”. Part of the answer to the assumed question: “13. Why did the NIST investigation not consider reports of molten steel in the wreckage from the WTC towers?” http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm

¹⁰³ Quoted from www.debunking911.com, article “Iron Burns!!!” by M. Ferran.

¹⁰⁴ Quoted from www.debunking911.com, article “Iron Burns!!!” by M. Ferran.

In addition to this main argument, the single claim that “*ancients*” would have “*used piles to make and refine and melt iron from ore*” is discussed. This claim is used at debunking911.com as a kind of reference to support the “fire melted steel in the collapse piles” argument. (The discussion of this claim will be found in the first subsection below.)

Furthermore, several statements that praise successful inventors and technologies are compiled. These statements show that steel melting was once a huge technical challenge. It is unlikely that random fires in random collapse piles would solve such a technical challenge by chance. (The compilation of these statements is included in the main argument).

Ferran suggests that heat accumulation due to insulation effects caused the fires at Ground Zero to burn hot enough to melt steel. NIST suggests the steel melted in the collapse piles based on “*long exposure to combustion*”. These two suggestions are addressed in a separate subsection following the main argument.

Rewriting the history of iron metallurgy

On www.debunking911.com M. Ferran stresses in the article “*Iron Burns!!!*”, **quote:**

A large pile of debris forms an insulating furnace retaining much of the heat of combustion, raising the internal temperature, evidently high enough to melt iron. That is how the ancients used piles to make and refine and melt iron from ore.

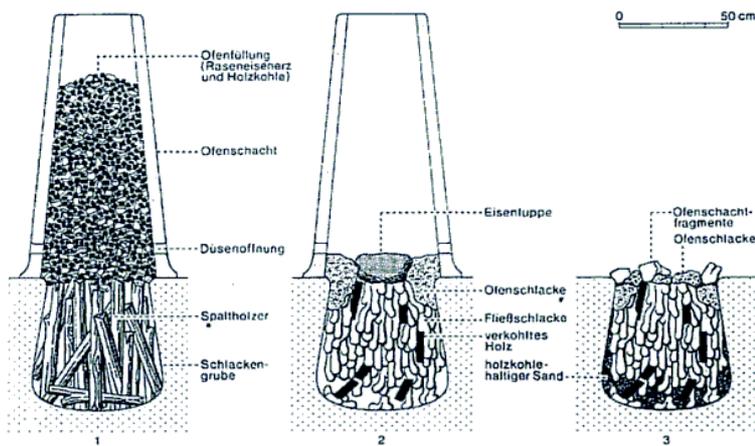
Ferran does not give any independent reference for the claimed “*evidently high enough*” “*internal temperature*”. Instead he refers to ancient technology. But have the *ancients* indeed “*used piles to make and refine and melt iron from ore*”, and did they achieve temperatures of 1500 degrees Celsius¹⁰⁵ or more using piles?

Mankind has been using iron since the Iron Age. But while the useful process of casting was already widely in use for certain metals and metal alloys with relatively low melting points (like silver and bronze) nobody made cast iron in the Iron Age, and nobody made cast iron in all the ancient cultures around the Mediterranean (like Egyptians, Greeks, Romans etc.), and nobody made cast iron in the European Middle Ages up to the 13th century. The reason why the people in those and in many other cultures had to do without is that they were unable to produce molten iron intentionally because they were unable to achieve, with the furnace technologies known to them, the high temperatures necessary for melting iron. Instead they used iron from meteorites and iron that was produced in so-called “*bloomeries*” by reducing iron ore to a solid iron “*lump*” or “*bloom*”.

¹⁰⁵ NIST states the melting point of the WTC steel as follows: “*The melting point of steel is about 1,500 degrees Celsius (2,800 degrees Fahrenheit)*”. Quoted from the fact sheet “Answers to Frequently Asked Questions”, answer to 7a, http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm. Melting steel needs temperatures between about 1400 degree Celsius (carbon content of about 2%) and about 1538 degree Celsius (melting point of pure iron). For the dependence of the melting point on the carbon content see Appendix M. The WTC steel was a low carbon steel.

Basically two kinds of bloomery furnaces are known, **quote**¹⁰⁶: “When iron making was properly established, two types of furnace came into use. Bowl furnaces were constructed by digging a small hole in the ground and arranging for air from a bellows to be introduced through a pipe or tuyere. Stone-built shaft furnaces, on the other hand, relied on natural draft, although they too sometimes used tuyeres. In both cases, smelting involved creating a bed of red-hot charcoal to which iron ore mixed with more charcoal was added. Chemical reduction of the ore then occurred, but, since primitive furnaces were incapable of reaching temperatures higher than 1,150° C (2,100° F), the normal product was a solid lump of metal known as a bloom.”

The **figure**¹⁰⁷ below shows the process in a shaft furnace bloomery schematically:



1 Rennfeuerofen vor dem Betrieb; 2 Rennfeuerofen nach Beendigung des Verhüttungsprozesses; 3 Überrest eines Rennfeuerofens nach Entnahme der Luppe (nach Backer u.a.), wie er im archäologischen Befund nachzuweisen ist.

Some translations regarding the diagram above:

Raseneisenerz	iron-ore
Holzkohle	charcoal
Düsenöffnung	opening(s) for blast(s)
Eisenluppe	iron-lump
Ofenschlacke	oven-slag

¹⁰⁶ Quoted from: article "**iron processing**" *Encyclopædia Britannica*, 2007. Encyclopædia Britannica Online. 3 2007 <<http://www.britannica.com/eb/article-9110659>.

The statements about the temperatures that were achievable in a bloomery vary in the literature. The chemical reaction that reduces the iron oxide ores to iron can start working at about 750 - 800 degree Celsius (see “An Introduction to Metallurgy” by Sir Alan Cottrell, second edition, 1975, reprinted 1995 Cambridge, UK; page 122). On the other hand some kinds of slag will be liquid at about 1200 degrees Celsius: “Since a bloomery operated at 1200 to 1400 degrees Celsius [...], the melting temperature of the slag was about 1200 degrees Celsius, and since pure iron melted at 1534 degrees Celsius, the iron metal was formed as a solid while the slag remained liquid.” (Quoted from Collier’s Encyclopaedia, Volume 13 of Twenty-Four Volumes, Lauren S. Bahr, 1997, page 279.) The differences in the stated working temperatures of bloomery furnaces might be due to experiments with differently constructed furnaces, and in addition due to the use of different ores (which result in different kinds of slag with different melting points) in such experiments. But there were no statements to be found in the literature that any bloomery furnace was capable of achieving temperatures in excess of 1400 degrees Celsius. Instead it is explicitly stated that bloomery furnaces were not capable of melting wrought iron.

¹⁰⁷ From: Hauke Jöns, “Eisenverhüttung in Jodelung, Kreis Nordfriesland”. UPA 40 [Bonn 1997] Abb. 79, Caption: “Rekonstruktion eines Rennfeuerofens mit Schlackengrube”. Here copied from: <http://www.archlsa.de/funde-der-monate/07.04/index.htm>

The following photograph¹⁰⁸ shows the remains of such a bloomery shaft furnace with a preserved opening for ventilation (excavation- site near Quedlingburg/Germany, dates from approximately 3rd to 4th Century A.D.):



Unterer Teil eines Ofens mit gut erhaltener Belüftungsöffnung [lower part of a furnace with well preserved opening for ventilation]

After the bloomery process the solid iron product was still mixed with slag (a mixture of variable by-products that were liquid at temperatures of approx. 1150° Celsius and above). As much as possible of the slag was forced out by hammering the hot “lump”, **quote**¹⁰⁹: “*This [the solid lump] may have weighed up to 5 kilograms (11 pounds) and consisted of almost pure iron with some entrapped slag and pieces of charcoal. The manufacture of iron artifacts then required a shaping operation, which involved heating blooms in a fire and hammering the red-hot metal to produce the desired objects. Iron made in this way is known as wrought iron.*”

The tall furnace used in the bloomery process was a basic shaft furnace. Shaft furnaces are efficient: the charge and the fuel are preheated during the way down to the “hearth” where the combustion takes place and the heat transfer is optimised (the charge and the burning fuel are in contact)¹¹⁰. However, mankind needed to develop the shaft furnace technology further and to invent the blast furnace in order to melt and cast iron. The English term “blast furnace” is due to the fact that it needs a very good supply of oxygen for the process: “*The earliest known blast furnace remains are from the Chinese Han period (c. 130 B.C.) The air blast for this furnace probably came from manually operated piston bellows. By the first century A.D. water power was being used to operate blast furnaces [in China]*”¹¹¹ The blast furnace was probably invented in South-East Asia and “*by about 500 B.C. the technology of smelting iron spread [...] to China, probably via India.*”¹¹²

The shaft furnace used in the bloomery process grew taller after water powered blasts came into use. The prolonged preheating zone and the resulting increased carbon content (which

¹⁰⁸ Photograph and caption: <http://www.archlsa.de/funde-der-monate/07.04/index.htm>)

See also: <http://iron.wlu.edu> , a website by people who produce iron ore in bloomeries, and <http://www.die-roemer-online.de/index.html?eisenherstellung/rennofen.html>, a German website that provides many details about the bloomery process, different furnaces types, etc. also based on their own use of this technology.

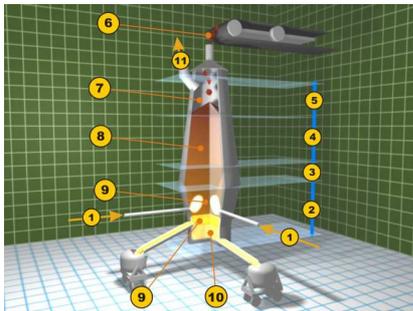
¹⁰⁹ Quoted from: article “**iron processing**” *Encyclopædia Britannica*. 2007. Encyclopædia Britannica Online. 3 2007 <<http://www.britannica.com/eb/article-9110659>>

¹¹⁰ **Quote:** “*Furnaces such as tower or shaft designs are designed to provide a classical counterflow heat exchanger process; the charge is preheated during its course down the tower, while furnace waste gases flow upwards.*” Quoted from: “Castings” by John Campbell, see above, page 37.

¹¹¹ Quoted from “*Collier’s Encyclopedia, Volume 13 of Twenty-Four Volumes*”, Lauren S. Bahr; copyright for 1997; article “Iron and steel” by Robert B. Goron; page 279.

¹¹² Quoted from *Collier’s Encyclopaedia*, Vol. 13, see above; page 279; a more detailed historical account is to be found at: http://www.edinformatics.com/inventions_inventors/steel.htm.

lowers the melting point significantly¹¹³) eventually resulted in the blast furnace where the end product is molten so-called “pig iron”¹¹⁴. The **diagram**¹¹⁵ below shows a basic schematic depiction of a modern blast furnace.



Description English: **Blast furnace diagram**

1. Hot blast from Cowper stoves
2. Melting zone
3. Reduction zone of ferrous oxide
4. Reduction zone of ferric oxide
5. Pre-heating zone
6. Feed of ore, limestone and coke
7. Exhaust gases
8. Column of ore, coke and limestone
9. Removal of slag
10. Tapping of molten pig iron
11. Collection of waste gases

Blast furnaces are all very tall and the terminology in some other languages (e.g. in German, and Spanish) for this kind of furnace translates into “high-furnace”. The shape and the filling from the top have the effect that fuel and iron-ore are already highly preheated when the combustion takes place. In addition, the iron produced in such a high furnace has a lower melting point: it “*contained about 4 wt per cent dissolved carbon, picked up from the furnace fuel. This carbon greatly lowered the melting point and so made the metal easy to re-melt and cast into moulds.*”¹¹⁶ The bloomery-produced iron had a much lower carbon content and thus a much higher melting point: “*The carbon contents of the early irons ranged from very low (0.07 percent) to high (0.8 percent), the latter constituting a genuine steel.*”¹¹⁷

The people in Europe needed some 2000 years to catch up with the Asian shaft furnace technique. A few single blast furnaces were working in Europe from about the 13th Century. The process was common in Western Europe only from the 16th Century. Mankind never used piles (neither sophisticatedly stacked piles nor piles similar to a dust covered collapse pile with a very random distribution of fuel, oxygen supply, and insulation) “*to make and refine*

¹¹³ See Appendix M in regard to the dependence of the melting point on the carbon content.

¹¹⁴ See “An Introduction to Metallurgy” by Sir Alan Cottrell, see above, page 123.

¹¹⁵ From: wikipedia, <http://de.wikipedia.org/wiki/Bild:VysokaPec.jpg>. The older blast furnaces were simpler (the “Hot blast from Cowper stoves” shown on this illustration was only invented in the 19th Century). See <http://www.gutenberg.org/files/17817/17817-h/17817-h.htm>.

¹¹⁶ Quoted from: “An Introduction to Metallurgy” by Sir Alan Cottrell, second edition, 1975, reprinted 1995 Cambridge, UK; page 2.

¹¹⁷ Quoted from article “steel” *Encyclopædia Britannica*. 2007. Encyclopædia Britannica Online. 24 2007 <http://www.britannica.com/eb/article-9110660>, see also “An Introduction to Metallurgy” by Sir Alan Cottrell, see above, page 123.

and melt iron from ore”. Instead they had to use the bloomery process “to make” iron from ore, and they had to develop the blast furnace technology to produce molten iron¹¹⁸.

Combustion based furnace technologies in iron metallurgy and a compilation of quotes regarding successful technologies and inventors

The ‘refining’ of the iron was also never performed in burning piles. Instead, either the red-hot lump produced in the bloomery process was hammered, or the pig-iron product was refined based on sophisticated technologies developed only relatively recently. The purpose of the refining process of pig iron was mainly for lowering the high carbon content of the blast furnace product in order to produce steel. However, lowering the carbon content raises the melting point of the iron significantly¹¹⁹, and it proved difficult to develop furnace technologies to achieve temperatures high enough to melt such low-carbon iron. Casting molten steel has therefore only been possible since the invention of the crucible process.

Below the different furnace technologies used in iron metallurgy are briefly explained in order to deduce the basic requirements (such as quality of fuel, etc.) that are needed to melt steel with fire¹²⁰.

Reverbaratory furnaces

In such furnaces the charge is exposed to the flames and heated from above. These types of furnaces were used in the finery¹²¹ and in the puddling process¹²² and are still in use in the open-hearth process (Siemens-Martin furnace).

¹¹⁸ More information about the bloomery process and the blast furnace technology can be found in books about metallurgy and in encyclopaedias. See, for example, “Engineering Metallurgy. Part I. Applied Physical Metallurgy” by Raymond A. Higgins, Sixth Edition, reprinted 1999 by Arnold, London, Sydney, Auckland; pages 145 [bloomery process] and 141f [blast furnace], and the article “iron processing” Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 3 2007 <<http://www.britannica.com/eb/article-9110659>> (with diagrams of two blast furnaces), and Collier’s Encyclopaedia, Volume 13 (see above), pages 284ff, and “An Introduction to Metallurgy” by Sir Alan Cottrell (see above), pages 122ff. The chemistry involved in the blast furnace process is explained in many chemistry and metallurgy books.

¹¹⁹ See Appendix M in regard to the dependence of the melting point on the carbon content.

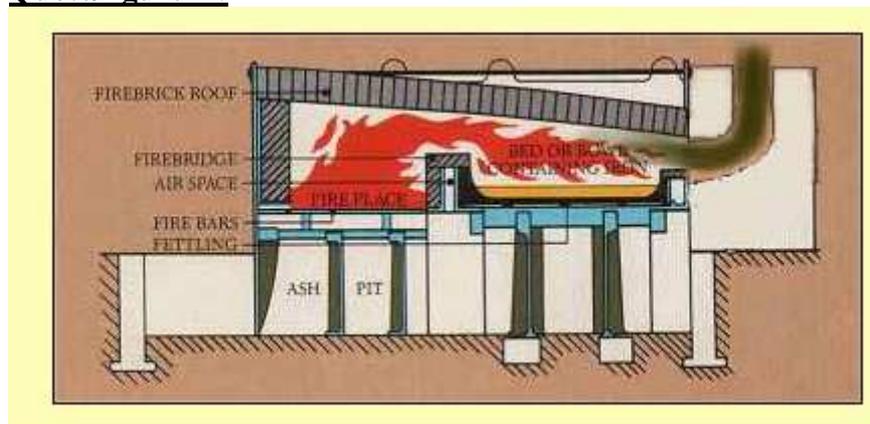
¹²⁰ Details not related to the question how the high temperatures are achieved (like chemical processes in steel-making) are omitted. Steel making technologies that are based on the use of already molten iron like the Bessemer process, or that use electricity (see, for example, “Engineering Metallurgy”, see above, pages 144ff) will not be mentioned further.

¹²¹ The finery process (an early technology in steelmaking) used a variety of the reverberatory furnace (source: http://en.wikipedia.org/wiki/Reverberatory_furnace) and converted “cast iron [the carbon rich product of the blast furnace] to wrought iron [with lower carbon content] by a process known as fining. Pieces of cast iron were placed on a finery hearth, on which charcoal was being burned with a plentiful supply of air, so that carbon in the iron was removed by oxidation, leaving semisolid malleable iron behind.” Quoted from the article “iron processing” Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 2 2007 <http://www.britannica.com/eb/article-81340>.

¹²² A development derived from the finery process was the puddling process: “Next, the advent of the steam engine to drive blowing cylinders meant that the blast furnace could be provided with more air. This created the potential problem that pig iron production would far exceed the capacity of the finery process. Accelerating the conversion of pig iron to malleable iron was attempted by a number of inventors, but the most successful was the Englishman Henry Cort, who patented his puddling furnace in 1784. Cort used a coal-fired reverberatory furnace to melt a charge of pig iron to which iron oxide was added to make a slag. Agitating the resultant “puddle” of metal caused carbon to be removed by oxidation (together with silicon, phosphorus, and manganese). As a result, the melting point of the metal rose so that it became semisolid, although the slag remained quite fluid. The metal was then formed into balls and freed from as much slag as possible before being removed from the furnace and squeezed in a hammer.” Quoted from the article “iron processing.” Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 2 2007 <<http://www.britannica.com/eb/article-81340>.

The coal fired reverberatory furnaces had an enhanced oxygen supply (fresh air was supplied from underneath and was drawn up with the help of a chimney). Nevertheless, these coal fired reverberatory furnaces were not capable of melting steel. The charge in the puddling process was molten only as long as the carbon content of the iron was still high¹²³. The “puddling” lowered the carbon content during steel making. The result was a spongy “semi-solid” lump¹²⁴. According to “An Introduction to Metallurgy” by Sir Alan Cottrell¹²⁵ the temperature at which the reverberatory furnace in the puddling process melted the carbon rich iron was about 1300 degree Celsius.

Quote/figure¹²⁶:



Cort's furnace offered several improvements over previous designs:

- A separate remote hearth kept the iron apart from the fuel and all the fire ashes.
- A high wall between the hearth and the charge guarded further against contamination.
- A tall chimney was on the far side causing a draught to draw heat from the fire across furnace charge.
- A damper in the chimney enabled the draught and therefore the temperature to be controlled by a lever within reach of the furnace operator (puddler).
- Doors set in the side on the furnace through which the charge could be accessed were crucial to hands-on control right through critical part of the operation.

(See one more figure with quote, and a quote from the book "The Iron Puddler" by J.J.Davies, with a picture of puddling furnaces, in Appendix M.)

The Siemens-Martin furnace, in which the air for combustion is preheated (and in some cases the fuel too), is capable of flame temperatures high enough to melt the charge from above. If oil is used as fuel in a Siemens-Martin furnace this oil is supplied atomized and under pressure. The hearth provides insulation and an arched roof reflects the heat onto the charge.

The main invention by Siemens was the use of the combustion gases to preheat the air and fuel before the combustion takes place. See the following **quotes**:

Quote¹²⁷: “William Siemens, a German living in England in the 1860s, seeking a means of increasing the temperature in a metallurgical furnace, resurrected an old proposal for using

¹²³ See Appendix M for the dependence of the melting point of iron/steel on the carbon content.

¹²⁴ **Quote:** “In this country wrought iron is made by the old puddling process, which consists in melting grey pig iron and millscale [mostly iron oxide] in a small coal-fired reverberatory furnace, the hearth being lined with iron oxides. The impurities in the pig iron react with the iron oxide to form a slag, largely iron silicate. The removal of silicon, manganese, phosphorus, and finally carbon, causes the freezing-point of the metal in the furnace to rise, until it is actually higher than the furnace temperature, and hence the metal solidifies into a pasty mass of metal closely intermixed with considerable quantities of slag.” Quoted from: “Metallurgy for Engineers” by E. C. Rollason, first published in Britain 1939, fourth edition 1973, reprinted 1992, London, New York (...); page 153.

¹²⁵ Second edition, 1975, reprinted 1995 Cambridge, UK, page 130.1

¹²⁶ Source: <http://homepage.ntlworld.com/paul.hawkins.tyd/Tyd/PuddledIron.htm>

¹²⁷ Quoted from the article “open-hearth process” Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 24 2007 <http://www.britannica.com/eb/article-9057179>

the waste heat given off by the furnace; directing the fumes from the furnace through a brick checkerwork, he heated the brick to a high temperature, then used the same pathway for the introduction of air into the furnace; the preheated air materially increased the flame temperature. The first to use the device to produce steel were Pierre and Émile Martin of Sireuil, France, in 1864 [...] Natural gas or atomized heavy oils are used as fuel ...”

And, quote¹²⁸: *“The open-hearth furnace was fired with air and fuel gas that were preheated by combustion gases to 800° C (1,450° F). A flame temperature of about 2,000° C (3,600° F) could be obtained, and this was sufficient to melt the charge.”*

And, quote¹²⁹: *“The open-hearth furnace (OHF) uses the heat of combustion of gaseous or liquid fuels to convert a charge of scrap and liquid blast-furnace iron to liquid steel. The high flame temperature required for melting is obtained by preheating the combustion air and, sometimes, the fuel gas. Preheating is done in large, stovelike regenerators or checker chambers, located beneath the furnace (see figure). These contain checker bricks stacked in such a way that they absorb heat from furnace off-gases as they are directed through the chamber. After one chamber has been heated for about 20 minutes, a sliding valve is activated, directing the off-gases to the other chamber and simultaneously bringing air into the heated chamber. This combustion air, after picking up the heat from the checker brick, then enters the furnace through an end-wall above the checker chamber and burns the fuel, which also enters the furnace at the same wall. The combustion flames heat the charge, and the off-gases, after moving across the hearth to the other end wall, are directed downward to heat the other chamber. This cycle, with entry ports becoming exit ports, is reversed every 15 to 20 minutes. [...]*

The two end walls are used as inlets or outlets for gas and air, and they also hold the injection burners for heavy oil, tar, or natural gas, when used.

Above the hearth, an arched roof contains the flames and reflects the heat onto the melt. Since thermal exposure is intense here, the roof is made of high-grade chrome-magnesite refractory bricks suspended from a steel structure”

See Appendix M for three figures: antique Siemens – Martin furnace, “brick checkerwork” (pre-heating chamber), modern Siemens – Martin furnace, and for additional information.

To summarize: A coal fire in a reverberatory furnace using an improved oxygen supply and radiation for heat transfer is not capable of melting steel. For melting steel in a well insulated reverberatory furnace the flame temperature has to be raised significantly by preheating the combustion air and sometimes also the fuel.

Technologies using solid fuel without preheating, the crucible process

In this kind of furnace the “charge is held in a pot, generally of a material with good thermal conductivity [...], covered with a lid and placed in a combustion chamber.”¹³⁰ This technology was widely used in the crucible process that is a “... technique for producing fine or tool steel. The process was invented in Britain about 1740 by Benjamin Huntsman, who heated small pieces of carbon steel in a closed fireclay crucible placed in a coke fire. The

¹²⁸ Quoted from article steel, <http://www.britannica.com/eb/article-81453/steel#623009.hook>.

¹²⁹ Quoted from the article "steel" [Encyclopædia Britannica](http://www.britannica.com/eb/article-9110660). 2007. Encyclopædia Britannica Online. 24 2007 <<http://www.britannica.com/eb/article-9110660>

¹³⁰ Quoted from: “An Introduction to Metallurgy” by Sir Alan Cottrell, see above, page 64.

temperature he was able to achieve (2,900° F, or 1,600° C) was high enough to permit melting steel for the first time ...”¹³¹. The crucibles were placed in the middle of a coke-fired furnace that was integrated into the floor of the workshop. It needed about three hours to melt some 15 –20 kg of steel per crucible. Smaller pieces of steel (approx. ½ kg) were charged in clay pots that were highly pre-heated. The furnace had to be refilled with coke continually until the desired result was achieved. The furnace had an enhanced oxygen supply. A separate storey was built underneath the fire place, connected by holes to the space containing the burning fuel. Fresh air was supplied from underneath and was drawn up with the help of a chimney¹³².

The amateur casting furnace as described in the book “Foundrywork for the Amateur”¹³³ is capable of melting small amounts (up to about 5 kilograms) of steel-scrap in one crucible. This crucible is placed in a relatively small furnace in the middle of the burning fuel. The fuel is coke.¹³⁴ The furnace has to be refilled with coke continually until the steel is molten. The furnace must be built in such a way (e.g. lined with fire bricks) that it provides adequate insulation. The oxygen supply is provided by an electrically powered blast of fresh air.

The use of crucibles slows down the heat transfer to the steel. The steel at Ground Zero was not in crucibles and most of the WTC steel lost the fireproofing due to the collapse. With the small cupola furnace as described in the book “Foundrywork for the Amateur” (see above) a technology can be taken into consideration that melts steel scrap in direct contact with burning solid fuel outside a big shaft furnace. “Basically the cupola is a tall cylinder lined ... with firebrick or the equivalent [this provides insulation to the sides]. There is provision for forced draught in the lower area where the melting takes place.”¹³⁵ The fuel is coke.¹³⁶ After a first layer of coke starts to burn steel scrap and more coke is charged from the top in layers. The small cupola furnace is shaped like a shaft furnace, it is charged from the top like a shaft furnace, and the diagram in the book “Foundrywork ...” is showing a small “pre-heat zone”. However, preheating seems not to play an important role in this small furnace given its size and that the first drops of molten steel should appear “five or six minutes” after the powerful air blast is applied.¹³⁷ It is noteworthy that this combination of high quality fuel, electrically powered air blast, insulation by firebricks, and a small pre-heating zone is not sufficient to guarantee that the steel will melt at the first attempt in such a small cupola furnace: “An earlier appearance than this [five to six minutes] may be taken as an indication that the blast is too severe and steps should be taken to modify the volume of air. Only experience will show with each particular cupola just how much draught is needed to obtain the best results. Conversely, of course, if the appearance of the iron is delayed appreciably beyond this time it

¹³¹ Quoted from “crucible process” Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 31 2007 <http://www.britannica.com/eb/article-9028044>.

¹³² Source in regard to oxygen supply in the crucible process: telephone communication with Sheffield's [Abbeydale Industrial Hamlet](http://www.abbeydaleindustrialhamlet.com), a museum site dating from Huntsman's times, which still makes some crucible steel. Other sources: <http://www.tilthammer.com/timeworks/hunt.html>, and <http://www.tilthammer.com/timeworks/crusteel.html> (These websites are part of the “*The TimeWorks Project - a collection of information about the Industrial History of Sheffield, with particular reference to Abbeydale Industrial Hamlet, an 18th Century Scythe Works.*”); and article “steel” Encyclopædia Britannica Online. 24 2007 <<http://www.britannica.com/eb/article-9110660>; and article “crucible process” Encyclopædia Britannica Online. 31 2007 <http://www.britannica.com/eb/article-9028044>, and http://en.wikipedia.org/wiki/Crucible_steel.

¹³³ By B. Terry Aspin, second edition 1998; Herts, England.

¹³⁴ “Each of the furnaces so described is intended for burning solid fuel and that, of course, means coke.” Quoted from T. Aspin, “Foundrywork ...”, page 18.

¹³⁵ Quoted from “Foundrywork ...”, page 91.

¹³⁶ “Foundrywork ...”, page 18, see quote above.

¹³⁷ “Foundrywork ...”, page 94.

may be taken that, either the blast is too weak or the original coke charge has been too lean."¹³⁸

To summarize: The known processes that can melt steel without preheating the fuel (and/or the air) use coke exclusively as fuel. In the processes with crucibles the coke has to be refilled. The heat transfer takes place mainly by conduction (direct or through the wall of the crucible). The oxygen supply is enhanced by a well-ordered airflow from underneath, or by an electrically powered air blast).

Shaft furnace technologies

A bloomery shaft furnace (see above) makes use of the following advantages:

- perfect heat transfer (fuel and charge are in contact during combustion)
- charcoal as fuel (charcoal is almost pure carbon)
- improved oxygen supply by hand driven bellows
- a preheating zone of about 1 meter long for fuel and charge during their descent through the shaft
- some insulation provided by the wall

It is significant that those smaller shaft furnaces used in the bloomery process were not capable of melting wrought iron or steel despite all of the advances involved. Nevertheless you needed "*considerable skill in the preparation of the ore and fuel, in the operation of the furnace [...]*" and if "*the gas composition and temperature in the furnace were not closely controlled [...]*" no iron resulted."¹³⁹

Additional improvements (compared to the bloomery process) are necessary to raise the temperature in a shaft furnace in order that the furnace will be capable of melting iron or steel. This is achieved by a combination of a much taller shaft with more powerful blasts in the blast furnace and in the cupola furnace¹⁴⁰. The taller shaft results in an extended preheating zone that raises the temperature in the combustion zone. The height of historical blast furnaces and of both the historical and the contemporary cupola furnaces is given in the literature as about 6 to 10 meters. Such a high shaft furnace with water or electrically powered air blasts and charcoal or coke as fuel can achieve a temperature of about 1600 degrees Celsius and more in the combustion zone. Insulation is provided by the walls of the shaft¹⁴¹.

¹³⁸ Quoted from "Foundrywork ...", page 94.

¹³⁹ Quoted from Encyclopaedia Collins, volume 13, page 279.

¹⁴⁰ The cupola furnace is used to melt iron and/or steel-crap (but not to reduce iron-ore). The cupola furnace is (in regard to the question how are high temperatures achieved) very similar to a blast furnace. **Quote:** "*René-Antoine Ferchault de Réaumur built the first cupola furnace on record, in France, about 1720. Cupola melting is still recognized as the most economical melting process; most gray iron is melted by this method.*"

Similar to the blast furnace, the cupola is a refractory-lined steel stack 20 to 35 feet (6 to 11 metres) high, resting on a cast-iron base plate with four steel legs. [...] Forced air [blast] for combustion enters the cupola through the openings (tuyeres) spaced around the rim of the lower portion of the cupola.

Iron, coke, and limestone flux are placed on a bed of coke high enough to hold the iron above the tuyere openings, where the temperature is the highest." Quoted from the article "cupola furnace" Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 2 2007 <http://www.britannica.com/eb/article-9028238>.

¹⁴¹ Modern blast furnaces achieve much higher temperatures due to additional technologies like the use of preheated air and some 30 meter high shafts. In these modern furnaces insulation is provided along most of the shaft but the combustion zone is cooled.

The fact that two furnaces that were once widely used in iron metallurgy (shaft furnace in the bloomery process, and coal fired reverberatory furnace) are not capable of melting steel despite both technologies using an enhanced oxygen supply, proper fuel, some insulation and in case of the bloomery process, preheating and optimised heat transfer, suggests how difficult it is to achieve temperatures high enough to melt steel. The following quotations underline that the establishment of technologies capable of achieving temperatures high enough to melt steel are regarded as remarkable achievements:

Quote (from a “Scientific American” Supplement from 1881) ¹⁴²:

“With respect to steel, in 1831 the process in use was that of cementation, producing blistered steel, which was either piled and welded to make shear steel, or was broken into small pieces, melted in pots, and run into an ingot weighing only some 50 lb. or 60 lb. At that time steel was dealt in by the pound; nobody thought of steel in tons. In 1881, we are all aware that, by Sir Henry Bessemer's well-known discovery, carried out by him with such persistent vigor, [still molten] cast iron is, by the blowing process, converted into steel, and that of Dr. Siemens' equally well-known process (now that, owing to his invention of the regenerative furnace, it is possible to obtain the necessary high temperature), steel is made upon the open hearth.”

And quote (from a metallurgy textbook) ¹⁴³:

“The earliest iron-making processes were, of course, necessarily limited to the solid state. Once the great technical barrier of reaching the high temperatures needed to melt the metal was overcome, however, the technology was transformed. [...] In 1746 Benjamin Huntsmann, making clocks in Sheffield, came to the conclusion that his steel clocksprings broke because the carbon in the metal was not uniformly distributed. To overcome this problem he melted the blister steel to improve homogeneity and so invented the crucible steel process, still used occasionally today. He was able to do this because crucible fireclays and coke-fired crucible furnaces had, by that time, developed to the level at which temperatures of 1600°Celsius could be reached. [...] The higher temperatures which could then be reached [in the Siemens-Martin regenerative furnace] enabled even low-carbon steel to be maintained in the molten state.”

And quote (from the Encyclopaedia Britannica) ¹⁴⁴:

A major development occurred in 1751, when Benjamin Huntsman established a steelworks at Sheffield, Eng., where the steel was made by melting blister steel in clay crucibles at a temperature of 1,500° to 1,600° C (2,700° to 2,900° F), using coke as a fuel. [...] Sheffield became the centre of crucible steel production; [...] The crucible process spread to Sweden and France following the end of the Napoleonic Wars and then to Germany, where it was associated with Alfred Krupp's works in Essen. A small crucible steelworks was started in Tokyo in 1895, and crucible steel was produced in Pittsburgh, Pa., U.S., from 1860, using a charge of wrought iron [with low carbon content, produced in a bloomery] and pig iron. The crucible process allowed alloy steels to be produced for the first time, since alloying elements could be added to the molten metal in the crucible [...]

¹⁴² Quoted from: Scientific American Supplement, Vol. XII, No. 312, December 24, 1881; New York; found at <http://www.gutenberg.org/files/17817/17817-h/17817-h.htm> / [EBook #17817]; The background of the problem discussed in the above quote is that after introducing blast furnaces and coke as fuel high carbon content iron, called cast or pig iron, was relatively easily available. But pig iron cannot be wrought and is brittle. To achieve steel with more useful properties for engineering the carbon content has to be lowered.

¹⁴³ Quoted from: “An Introduction to Metallurgy” by Sir Alan Cottrell, second edition, 1975, reprinted 1995 Cambridge, UK, page 122, 131, and 135.

¹⁴⁴ Quoted from article “steel”/history [Encyclopædia Britannica](http://www.britannica.com/eb/article-9110660), 2007. Encyclopædia Britannica Online. 24 2007 <<http://www.britannica.com/eb/article-9110660>.

An alternative steelmaking process was developed in the 1860s by William and Friedrich Siemens in Britain and Pierre and Émile Martin in France. The open-hearth furnace was fired with air and fuel gas that were preheated by combustion gases to 800° C (1,450° F). A flame temperature of about 2,000° C (3,600° F) could be obtained, and this was sufficient to melt the charge. [...]

The great advantage of the open hearth was its flexibility: the charge could be all molten pig iron, all cold scrap, or any combination of the two. Thus, steel could be made away from a source of liquid iron.”

And quote (from the Encyclopaedia Britannica)¹⁴⁵:

“The eventual decline in the use of wrought iron was brought about by a series of inventions that allowed furnaces to operate at temperatures high enough to melt iron. It was then possible to produce steel, which is a superior material. First, in 1856, Henry Bessemer patented his converter process for blowing air through molten pig iron, and in 1861 William Siemens took out a patent for his regenerative open-hearth furnace.”

These quotations about the successful technologies indicate that it was difficult to develop furnaces capable of achieving temperatures high enough for steel-melting. Mankind was not able to melt steel for centuries despite many attempts to find out how to melt steel. The suggestion of steel melting in WTC collapse piles is inconsistent with the fact that melting steel was once a technical challenge.

Comparison: fuel and oxygen supply in the successful technologies and in the collapse piles

You can conclude from the above that the conditions in regard to fuel and oxygen supply, insulation and preheating, as they are found in successful technologies, represent basic requirements needed to melt steel. These basic requirements are either:

- (1) A high shaft furnace with powered air blasts, an extended preheating zone based on counter flow, solid quality fuel, optimized heat transfer, and insulation (in the blast or cupola furnaces),
- or (2) oil that is atomized and charged under pressure and that combusts with highly preheated air in an insulated space next to the charge (in the open hearth process),
- or (3) a combination of high quality solid fuel, enhanced oxygen supply, efficient heat transfer by conduction and some insulation at the right places (in both amateur furnaces and in the crucible process).

In the following the likely conditions in the WTC collapse piles are assessed on the basis of these basic requirements.

Concerning case (1):

It seems reasonable to rule out that just by chance at Ground Zero there was something similar to a six meter or higher shaft furnace with powered blasts, with an extended preheating zone based on counter flow, with walls providing insulation and filled with a charge of steel and charcoal (or another solid quality fuel).

¹⁴⁵ Quoted from article: " iron processing ." Encyclopædia Britannica Online. 2 2007
<<http://www.britannica.com/eb/article-81340>.

Concerning case (2):

With diesel fuel a high quality liquid fuel was available at some places in the collapse piles comparable to the oil fuels used in the open hearth process in regard to heat releasing properties. But any diesel fuel will not have melted steel in the WTC collapse piles. The diesel fuel was not under pressure and atomized. Moreover, highly preheated fresh air was not available in the collapse piles. Without preheating the flame temperature of is too low to melt steel.

Additionally a lot of the diesel fuel was in fact recovered and did not burn at all. See the following quote¹⁴⁶:

“72,000 gallons of diesel fuel were stored in a tank (on basement level 7) for the WTC complex backup generator/power systems. Final status: The tank was eventually located and inspected. Although slightly damaged, no leaks were found. The fuel was removed.”

And, photograph with quote¹⁴⁷:



“Preventing Spills

RICH GARLOCK: This is the emergency generator fuel for standby generators in WTC 5 — two 10,000-gallon diesel tanks completely intact. Diesel storage for the emergency generators located on the B-6 level, west of Tower One were also found intact. The Environmental Protection Agency was able to remove the diesel from those as well. We didn't want to have a fuel spill, and we wanted to take every precaution to eliminate these threats before a contractor went in and demolished the building.

Concerning case (3):

¹⁴⁶ Quoted from: “Disaster Response ...”, see above.

¹⁴⁷ Quoted from: http://www.pbs.org/americanbuilds/engineering/engineering_hazards_02.html.

You need either coke or something with similar heat releasing properties to coke, to melt steel with solid fuel without a big shaft furnace. Coal fired reverberatory furnaces were not capable of melting steel, and all successful technologies that are based on solid fuel and smaller furnaces use coke. The importance of the fuel quality can be inferred from the following **quotes**.¹⁴⁸:

“He [B. Huntsman, inventor of the crucible process] began experiments to produce a better quality of steel but had difficulty in obtaining suitable fuel for his steel making furnace. In 1740, he moved to Sheffield where there was a better supply of the coke he needed as a fuel”

and¹⁴⁹: *“Coke, extremely important in iron-making and in metallurgy generally, is made by heating a coal containing about 20 per cent volatiles [...]. The volatile constituents are driven off to be used as fuel gas and hard porous coke is left behind. [...] Coke is expensive and coal of the right type for making it is very scarce in many parts of the world. This has important effects on iron making practice; e.g. careful preparation of the furnace charge (by crushing and sintering [...]) to improve the thermal efficiency; injection of other fuels, e.g. gas, oil, powdered coal, in the (heated) air blast in the furnace [...].”*

The properties of a fuel depend mainly on the heat of combustion (the energy released if a given amount of the fuel combusts), and on the heat releasing rate (the time it needs to release a given amount of energy). The solid combustible substances in the collapse piles were mainly office contents. Many construction materials will not burn (e.g. gypsum, cement, plaster, mortar, aluminium, glass) so anything combustible from the buildings themselves were mainly various plastics (e.g. cable insulations and pipes).

It is possible to compare the heat of combustion of typical office contents with the heat of combustion of coke because NIST performed burn tests on replica “WTC workstations” (to establish data with respect to the pre-collapse fires). The average thermal energy released from one kilogram burned workstation content was between 16,9 and 19,8 MJ/Kg. See for this the following **quote (table)** from *NISTNCSTAR 1-5c*¹⁵⁰:

¹⁴⁸ Quoted from: <http://www.tilthammer.com/timeworks/hunt.html>.

¹⁴⁹ Quoted from “An Introduction to Metallurgy” by Sir Alan Cottrell, second edition, 1975, reprinted 1995 Cambridge, UK, page 60.

¹⁵⁰ page 27/ sheet 63 in PDF

Table 3–1. Key results from the workstation fire test burns.

Quantity	Test					
	1	2	3	4	5	6
Workstation	½ Generic	Generic	Generic	WTC	Generic	Generic
Tiles	N	N	Y	N	N	Y
Jet fuel	N	N	N	N	Y	Y
Peak HRR ^a (MW)	5.92/5.77	8.70/8.48	7.56/7.30	9.89/9.66	9.12/8.91	7.960/7.60
Time to peak (s)	490	530	590	510	160	200
Net peak HRR ^a (MW)	3.82/3.67	6.95/6.73	5.53/5.27	7.72/7.46	7.38/7.17	6.17/5.95
Peak MLR (kg/s)	0.197	0.308	0.263	0.420	0.336	0.293
Time to peak (s)	480	530	560	490	160	180
Net heat released (GJ)	1.20	4.05	4.13	2.93	3.60	3.74
Time interval ^b (s)	150 to 265	50 to 3200	160 to 600	30 to 2100	0 to 2500	20 to 2520
Total mass loss (kg)	69.1	205.0	213.6	173.6	200.2	205.3
Effective heat of combustion (MJ/kg)	17.4	19.8	19.3	16.9 ^c	18.0	18.2
FWHH ^d (s)		244	445		318	451
t(75 %) ^e		1311	1453		833	1009
t _{ig} ^f (s) (item ignited)	39 (paper)	67 (paper)	56 (paper)	50 (paper)	90 (Jet A)	114 (paper)

- a. The first number is the calorimeter output; the second is a 10 s average about the absolute peak.
- b. The time interval applies to both the net heat released and to the total mass loss.
- c. There was some spillage of smoke in Test 4, which may partly account for the lower heat of combustion.
- d. Full width half height of net HRR curve.
- e. Time at which 75 percent heat had been released and 75 percent of mass had been lost.
- f. Time of ignition of first object within workstation.

And quote¹⁵¹:

Description of Experiments

Table 2–4. Categories of materials in the WTC workstation.

Material	Mass (kg)	Fraction of Total	Effective Heat of Combustion (MJ/kg)
Wood/laminate	94.8	0.40	14
Paper	63.7	0.27	14
Plastics^a	41.0	0.18	16 to 38
Carpet	34.2	0.15	22

- a. Includes computer monitor shell (16 MJ/kg), wall fabric (30 MJ/kg), and chair composite (38 MJ/kg).
- Note: Bold items have values different from those in the generic workstation.

(For some more details from NIST’s report on these tests see Appendix: workstation burn tests by NIST or see NIST NISTNCSTAR 1-5C).

The average heat of combustion of the burned workstation contents is in any case lower than the heat of combustion of coke, and roughly only two thirds of the heat of combustion of high quality coke. Coke has a heat of combustion between 23 and 31MJ/Kg. In iron metallurgy you would need to use a high quality coke (or a tall shaft furnace). Only certain plastics in the replicated workstations, namely chair composites, had a higher heat of combustion than coke (see the quote above by NIST). But there will not have been any pile consisting of “chair composites only” in the collapse piles to burn effectively enough to melt steel.

You can assume that the burnable matter from the NIST test scenarios was not very different from the overall burnable matter that was to be found in the collapse piles¹⁵². The main difference was that the burnable matter in the collapse piles was likely to be fragmented and

¹⁵¹ Page 9 (sheet 45 in PDF).

¹⁵² In two tests NIST added jet fuel to the workstations. These tests can account for the possibility that solid fuel in the collapse piles was mixed with spilled liquid fuel.

mixed up with huge amounts of incombustible building fragments like cement, glass, and wallboard, and with dust. See the following **quote**¹⁵³:

“People asked me if I saw a lot of furniture in the debris,” said Wagner. “But just about everything from the Towers was pulverized. It was surprising to find anything recognizable.”

And, **quote**¹⁵⁴:

“Firehouse: *Did you find anything that was recognizable?*

Grant: *Parts of chairs, like the whole back of a chair or the whole seat of a chair or the wheels and the metal on the bottom. All the concrete dust was compacted and it was like clay, digging in it. So I’m digging around in it and I pull out an eyeglass case. The glasses were fine. It was like they were brand new, not a speck of dust or a crack or anything on them. And in the same area I got a ladies purse and I opened it and a calculator was on inside. [...]*”

The mix of workstation contents and unburnable cement, gypsum and glass in the collapse piles must have had a much smaller heat of combustion than the pure workstation contents from NIST’s tests¹⁵⁵. The heat of combustion of the mixed up materials in the collapse piles was therefore in any case lower than the heat of combustion of coke and at many locations it must have been very much lower.

The time the coke needs to release the heat energy by combustion (the heat release rate that mainly determines the resulting temperature) is speeded up in all of the technologies used in iron metallurgy with an enhanced, regulated oxygen supply (see above). Furthermore, the heat release rate in the commonly used furnace technologies capable of melting steel, and using solid fuel, is not only high but fairly constant (due to the quality of the fuel). Contrary to this the heat release rates of the burning office contents in NIST’s burn tests have one or more random peak(s) and then they diminish.

NIST also performed burn tests on a compartment of three workstations next to each other:

¹⁵³ From: http://www.pbs.org/americanrebuilds/artifacts/artifacts_08.html.

¹⁵⁴ Quoted from: <http://www.firehouse.com/terrorist/911/magazine/gz/grant.html>, interview with firefighter who worked at Ground Zero.

¹⁵⁵ There exist many statements similar to the above. The following is the only exception known to me, **quote:**
*“Firehouse: Did you find anything that was recognizable besides rebar or steel?
Fenick: As far as debris, recognizable debris? You mean structural type?*

Firehouse: Anything, like a desk or a computer or a chair?

Fenick: Most of it was pretty crushed. You would find a lot of books. One area was filled with books. It must have been in the library. You could tell some chairs.”

Quoted from <http://www.firehouse.com/terrorist/911/magazine/gz/fenick.html>; interview with fire-fighter who worked at Ground Zero. Note, that a pile of burning books would not melt steel.



Source: NIST.

Figure 2–6. Image highlighting the arrangement of ceiling tiles used in Tests 3 and 4. The spray burner and compartment openings are visible towards the rear.

In one of the experiments NIST changed the interior to have a “rubble” version¹⁵⁶:

- **Extent of Rubble.** The airplane impact zone could be expected to involve extensively fragmented workstation components along with fragmented materials from the airplane itself. This type of fragmentation would likely result in what amounts to “packing” of the various fuel surfaces, leading to decreased ease of air access to those surfaces and, thus, a reduced burning rate. This type of burning is difficult to model, given only the fuel characterizations based on Cone Calorimeter measurements reported in NIST NCSTAR 1-5C. This issue was addressed, in a partial manner, in one of the experiments (Test 5) in which the workstations were configured into a “pile of rubble,” or disassembled into a non-standard configuration. In the other five experiments, the workstations were tested in an undisturbed configuration. Results from these five experiments only apply to the extensive areas beyond the immediate impact zones and to WTC 7.

¹⁵⁶ Quoted from NISTNCSTAR1-5E, page 9, or sheet 43 of 158 in PDF. Pictures below NISTNCSTAR1-5E, page 19, sheet 53 of 158 in PDF.



Source: NIST.

Figure 2-7. The arrangement of "rubblized" Workstations 1 (left) and 2 (right) with ceiling tiles before Test 5. Part of the spray burner is visible on the left.



Source: NIST.

Figure 2-8. The arrangement of Workstation 3 before Test 5.

In the "rubblized" burn test the total heat release (as defined by NIST, see quote above) declined significantly (Test 5 is the "rubblized" test), quote/table¹⁵⁷:

¹⁵⁷ Quoted from NISTNCSTAR1-5E, page 57, or sheet 91 of 158 in PDF.

Table 5–2. Total heat release.

Test	Total Heat Release ^a (GJ)	Corrected for Spray Fire (GJ)	Corrected for Spray Fire, Jet Fuel, Tiles & Wall Lining (GJ)
1	16.5	15.3	11.7
2	12.8	11.6	13.4
3	14.6	14.3	12.7
4	14.0	12.8	12.7
5	8.8	8.6	8.2
6	11.3	11.1	10.8
Average (Tests 1-4, 6)	13.8 (± 14 %)	13.0 (± 14 %)	12.3 (± 8 %)

a. Using the definition that the total energy is released between the time of ignition and the time when the HRR falls to 2 MW.

And quote¹⁵⁸:

Although the mass of combustibles in Test 5 was the same as the other tests, the configuration in Test 5 was arranged such that the combustibles were shielded from the fire to simulate “rubble.” The results in Table 5–2 complement the mass loss data shown in Table 4–2. It was not surprising, therefore, that the total heat release was significantly lower in Test 5 than in the other tests.

And quote/diagram¹⁵⁹:

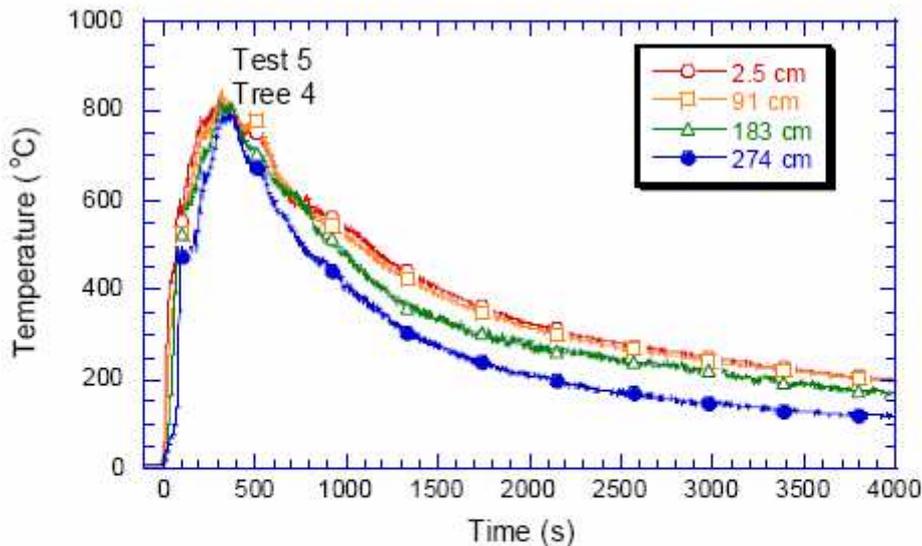


Figure 6–16. Bare bead thermocouple measurements as a function of time at four locations (below the ceiling) on Tree 4 during Test 5.

Note that “rubble” in NIST test means clean surfaces (no dust, no concrete, no gypsum, etc), and the materials burnt in a well ventilated area. Nevertheless the maximum

¹⁵⁸ Quoted from NISTNCSTAR1-5E, page 58, 92 of 158 in PDF.

¹⁵⁹ Quoted from NISTNCSTAR1-5E, page 72, or 106 of 158 in PDF. The different graphs in the diagram above show the temperatures that were measured by measuring devices that were placed at 2.5cm, 91cm, etc. below the ceiling.

temperatures measured in the “rubblized” test were about 300° Celsius/Kelvin lower compared to NIST’s other workstation burn tests.

The “*decreased “ease of air access to those surfaces and, thus, a reduced burning rate”*” (quote by NIST, see above) that lowered the maximum temperature of the fire in the NIST burn test to 800 degrees Celsius must have been much more pronounced in the collapse piles due to the dust, concrete, gypsum, etc., and due to the general very restricted *ease of air access to ... surfaces*. Any supply of fresh air was restricted in many parts of the piles because the WTC was built in a so-called “bath tub”¹⁶⁰. If the dust free “rubblized” version of the burning workstations from NIST’s Test 5 caused a significantly less intense fire, the office contents in the collapse piles that were covered with dust and mixed with concrete, gypsum etc. and that did not have access to fresh air, cannot have burned with a high heat release rate. If they burnt at all they will have only smoldered or burnt as weak fires.

The successful technologies for melting steel with solid fuel without a big shaft furnace need a high quality fuel and an enhanced, regulated oxygen supply. Neither of these were available in the collapse piles. The likelihood of melting steel in WTC collapse piles is therefore close to zero.

You can also conclude from the above that fires from burning office contents in the collapse piles cannot have burned hot enough to account for the surface temperatures stated for the collapse piles hot spots in the USGS (see above, Part I). If 800° Celsius is the maximum temperature of the fire in the “rubblized” NIST workstation burn test you would need an actual surface fire of clean office contents to account for a surface temperature of 800° Celsius. But there were none. NIST’s “rubblized” workstation burn test proves that the hottest hot spots cannot have been caused exclusively by fires.

Heat accumulation based on good insulation and steel melting due to long exposure to combustion

NIST states, **quote**¹⁶¹:

“Any molten steel in the wreckage was more likely due to the high temperature resulting from long exposure to combustion within the pile...”

NIST suggests a kind of “slow melting” technique with the use of the term “*long exposure to combustion*”. But fires that burn at temperatures below the melting point of steel cannot melt steel even if they burnt for an unlimited time. The direction of heat transfer “*is always from the system at the higher temperature to that at the lower temperature*”. This is a fundamental law in physics, the so-called second law of thermodynamics¹⁶². The determined direction of

¹⁶⁰ See, for example, the following **quote**: “*The WTC complex sits over a bathtub-shaped cavern that was hollowed-out to accommodate the underground service areas. During the original construction, an 80-foot tall by three-foot thick slurry wall had been built to keep the Hudson River out, which it successfully did for more than 30 years.*” Quoted from “Disaster Response ...”, see above.

¹⁶¹ Quoted from the NIST fact sheet, see above.

¹⁶² The second law of thermodynamics can be found written down in different statements. The statement quoted here addresses heat transfer directly. **Quote**: “*When two systems are placed in thermal contact, the direction of the energy transfer as heat is always from the system at the higher temperature to that at the lower temperature.*” Quoted from “Thermal physics” by Michael Sprackling, Houndmills, Basingstoke, Hampshire and London, first published 1991, page 74.

heat transfer cannot be reversed by a “*long exposure*” time. Therefore NIST’s suggested “*long exposure*” technique can not explain how steel might have melted at Ground Zero.

The theory by M.Ferran is essentially summarized with the statement: ‘Effects based on good insulation, heat accumulation and preheating allowed steel melting at Ground Zero.’

This argument is contained in the “*Iron Burns!!!*” article but it refers to burning piles in general (and not only to piles of “burning iron”). See, for example, the following **quote** from “*Iron Burns!!!*” (footnotes added):

]

Any combustible material in the "piles" of the WTC that was exposed to heat and to any amount of infiltrating air (oxygen) would contribute to hot-spots. All of the conjectures that say the steel formed before the buildings collapsed are ignorant and preposterous. The Steel in the rubble of the WTC melted, if at all, because of the enormous size of the piles and presence of much combustible materials in them, not merely because of the burning of jet fuel. Those who say otherwise are either lying, or are overlooking something fundamental. While jet fuel flame burning in OPEN AIR will may not maintain the temperature you need to melt steel, if you inject any fuel mixed with air into a huge porous mass that cannot rapidly release the built-up heat of combustion, you will produce a furnace capable of melting steel or practically any other metal. An open flame rapidly dissipates the heat of combustion, but a furnace conserves and accumulates the heat of combustion. Any fuel will produce this effect in the appropriate furnace. Its like the difference between the heat of an open wood-flame of a single stick burning in open air, compared to the (steel-melting) white-hot heat produced in the bottom of a large pile of wood and burning wood-coals.

¹⁶³. [...]

No matter which mechanism is involved, the oxidation reaction will generate heat. If there is some form of insulation, which is usually provided by the mass of the material itself, the heat cannot be dissipated. Because the heat is not dissipated, the temperature of the material increases. The increase in temperature will in turn increase the rate at which the oxidation reaction occurs, which in turn will increase the amount of heat generated, and so on. This increase after increase continues until either the heat is dissipated some way [e.g. by melting steel], or the material reaches its ignition temperature and starts to burn.

¹⁶⁴

¹⁶³ There is no “(steel-melting) white-hot heat produced in the bottom of a large pile of wood and burning wood-coals.” Wood will not produce “white-hot” fire, and charcoal will only produce such temperatures in a tall shaft furnace but not in a pile. Just to put the claim “*capable of melting ... any other metal*” in perspective: the metal niobium melts at 2468° Celsius.

¹⁶⁴ Heat will always *dissipate* to some degree (even if dedicated insulation is provided), not just by the suggested melting of steel. Insulation can slow down heat transfer processes, but insulation cannot stop them. For example: a liquid that is boiling hot and no longer being heated will cool down to ambient temperatures even if it is in a vacuum flask. Any solid insulation layer will conduct some heat to its cooler side. In addition any solid piece of insulation will radiate heat too. Additionally, any combustion can only take place if you have a supply of fresh air and if the waste gases are removed. The latter removes heat. (Ferran himself explains this effect in “*Iron*

Fires within a pile can in fact heat material in the pile. This raises the flame temperature if the preheated material burns. However, Ferran himself states that *“This increase after increase continues until either the heat is dissipated [...], or the material reaches its ignition temperature and starts to burn.”*¹⁶⁵ If some combustible material *reaches its ignition temperature* it will in fact start to smoulder or burn (given there is enough oxygen in the air). This point of spontaneous ignition is between 200° and 300° Celsius for plastics, about 175° Celsius for newspapers, about 360° Celsius for office paper, and between 280° and 340° Celsius for wood¹⁶⁶. Any preheating in a random environment is therefore limited to a maximum temperature difference of about 200 to 300 degrees Celsius/Kelvin¹⁶⁷. Any preheating of air is limited in a similar way: air containing enough oxygen and at temperatures between 500-600 degrees Celsius will ignite burnable matter. Furthermore, you need air with enough oxygen for combustion, but air near a fire is likely to be mixed with waste gases. Preheating in random collapse piles will not result in the high temperatures achievable in a Siemens-Martin furnace. It might ignite some fires but these fires will smoulder or burn with the low heat release rate determined by the dust layer, the lack of a proper fuel, the mixture of the combustible matter with non-combustible matter, and by the oxygen starved air.

Steel melting collapse piles as disinformation

Textbooks and other reference literature are likely to discuss what has significance, and the average textbook only explains the blast furnace technology and the open heart process. Something that does not work is unlikely to be mentioned at all. The difficulty (or even impossibility) of finding any statement in such independent references about *“steel melting due to combustion in piles”* makes *“steel melting due to combustion in WTC collapse piles”* into a perfect disinformation argument.

NIST does not make a clear claim with respect to ‘melting steel in WTC collapse piles’. NIST suggests something by using the term *“combustion”*. NIST performed the above mentioned burn tests, and they must know that dust layers and oxygen starved air will not raise the heat release rate and the temperature of a fire. They must know that fires in the collapse piles burnt with a heat release rate that was much lower as in their “rubblized” Test 5¹⁶⁸. NIST proves with the answer to question 7a (in the WTC fact sheet) that NIST is aware of the fact that building fires, hydrocarbon fires, and the pre-collapse WTC fires were not capable of melting steel¹⁶⁹. So why should NIST assume that the same materials would be capable of melting

Burns!!!”, quote:

Thus, such a carbon fire requires a "convection" current to remove the hot carbon mon/dioxide (out the top) to make room for more cold oxygen to be brought in (at the bottom).

[...] Convection currents are a strong mechanism for REMOVING heat from a fire.)

¹⁶⁵ Ferran fails to mention that a lack of fuel and/or oxygen would stop any *“increase after increase”*.

¹⁶⁶ Source: <http://de.wikipedia.org/wiki/Z%C3%BCndtemperatur>, September 08, 2007.

¹⁶⁷ The inserted *“[e.g. by melting steel]”* (in the last sentence of the above quote from *“Iron Burns!!!”*) suggests misleadingly that *“increase after increase”* might be possible up to the temperature where steel melts without reaching the ignition temperatures of the available combustible materials. It is an example of a manipulation technique repeatedly used by Ferran.

¹⁶⁸ NIST has even a “Building and fire research Laboratory” (see below).

¹⁶⁹ NIST states, **quote:** *“The melting point of steel is about 1,500 degrees Celsius (2,800 degrees Fahrenheit). Normal building fires and hydrocarbon (e.g., jet fuel) fires generate temperatures up to about 1,100 degrees Celsius (2,000 degrees Fahrenheit). NIST reported maximum upper layer air temperatures of about 1,000 degrees Celsius (1,800 degrees Fahrenheit) in the WTC towers (for example, see NCSTAR 1, Figure 6-36).”* Quoted from the NIST fact sheet “Answers to Frequently Asked Questions”, see above, answer to 7a, http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm.

steel when they burn in conditions that lower the heat release rate? NIST certainly knows the effect of restricted air access on the heat release rate for certain (see above NIST's discussion of the "rubbelized" test). It is obvious that the air access in the collapse piles was much more limited as compared to the "rubbelized" test. It is beyond doubt that NIST's engineers and scientists from the relevant research areas know that sufficiently hot temperatures were not achievable in random collapse piles fires. That NIST suggests that steel might have melted in the collapse piles is therefore deliberately misleading.

It is also beyond doubt that NIST's engineers and scientists from the relevant research areas know the second law of thermodynamics¹⁷⁰. That NIST suggests a kind of "slow melting" technique with the term "*long exposure to combustion*" is additionally revealing. If you would melt steel due to "*long exposure to combustion*" the 'energy losses' for maintaining the rising temperature difference between the steel and the surrounding area would increase more than linearly with the exposure time¹⁷¹. With only a limited amount of "fuel" available at any given location in the collapse piles it is nonsensical to suggest that a "*long exposure to combustion*" might do the job and NIST must be aware of this.

Some statements by Ferran indicate that his claims are deliberately misleading. To support his argument Ferran equates charcoal with wood, and claims:

Even ordinary dry WOOD (charcoal) in a large enough furnace, is capable of melting iron:
<http://www.uky.edu/KGS/geoky/fieldtrip/BigSinking/Furnace/furnace.htm>

The purpose of this statement is obvious: there was wood from furniture in the collapse piles, Ferran refers to Ground Zero with the term "*oven*" and furnace¹⁷², and the collapse piles were in fact very large. Ergo, melting steel was possible in the "large furnace" Ground Zero. The sentence structure suggests that the statement was supported by a reference from a website of the University of Kentucky. But if you follow the link provided by Ferran you do not find evidence for Ferran's claim, but several pictures from a neatly built shaft furnace. See three of the [pictures](#)¹⁷³ (note the size of the furnace):

¹⁷⁰ The second law of thermodynamics is basic knowledge and famous in physics.

¹⁷¹ The energy losses to the surrounding area will increase linearly with the exposure time for a given temperature difference. Additionally the heat transfer per unit time through a given insulation layer will increase even more than linearly with the temperature difference. See for this "CHEMICAL ENGINEERING, Volume 1, Fluid Flow, Heat Transfer and Mass Transfer" by J. M. Coulson and J. F. Richardson, Elsevier, first published 1954, Sixth edition 1999, reprinted 2004, chapter 9 "Heat Transfer", pages 381ff and particularly 387ff.

¹⁷² See above the statement by Ferran "*oven of steel melting intensity*". **Quote** from "Iron Burns!!!": "*After they fell, the huge piles of iron beams and combustible materials formed two enormous furnaces, comprising burning office materials, burning metal, and [...] (not to mention many tons of combustible aircraft aluminium and iron, i.e., thermite) which over the course of several weeks and months.*" (To suggest that aircraft aluminium and iron would be thermite is also misleading. But it is perfect for Ferran's purpose. It is only mentioned in passing because it is so nonsensical that he cannot support it with any argument. But by mentioning it in passing it appears as if it were something obvious that does not need any explanations or references.)

¹⁷³ From: <http://www.uky.edu/KGS/geoky/fieldtrip/BigSinking/Furnace/furnace.htm>.



[Full Size Image](#)

”furnace03.jpg
Fitchburg Furnace”



[Full Size Image](#)

”furnace17.jpg”



[Full Size Image](#)

”furnace16.jpg
Looking skyward from within the Blackstone stack”

It is correct that the kind of “*large enough furnace*” that is pictured is “*capable of melting iron*” (but you have to use charcoal, anthracite, or coke as fuel, not wood, and you have to add air blasts). But it is not possible to find any relevant similarities between the purpose built neat shaft furnace and the random WTC collapse piles. The *engineer of high academic achievement* Ferran certainly knows that it makes no sense to refer to a neat shaft furnace when discussing the subject of melting steel at Ground Zero. In addition, you cannot substitute the charcoal with dry wood. If dry wood would do the job charcoal burning would not have been the important industry that it was before coke was invented¹⁷⁴. Ferran knows that charcoal is not simply dry wood, **quote**¹⁷⁵ (from the email exchange at the end of “*Iron Burns!!!*”):

An ordinary wood fire burns down to charcoal (after burning off the volatile constituents of living wood) that can burn red-hot without producing any visible gaseous “flames”.

Ferran also makes the following statement, **quote**¹⁷⁶ (from the email exchange at the end of “*Iron Burns!!!*”):

A pure-carbon (charcoal) fire is very capable of melting steel.

¹⁷⁴ See “An Introduction to Metallurgy” by Sir Alan Cottrell, second edition, 1975, reprinted 1995 Cambridge, UK, page 124.

¹⁷⁵ Quoted from “*Iron Burns!!!*”

¹⁷⁶ Quoted from “*Iron Burns!!!*”

Given that dry wood is obviously not “*pure-carbon*”, and that Ferran certainly is aware of this, it seems deliberately misleading to equate both.

Ferran is also aware of the difference it makes for the fuel quality and for the heat release rate if you have either complex organic compounds (as in dry wood) or if you have smaller compounds and no bound water (as in charcoal). His statement with the super-heated jet fuel (see below) proves that he knows the relevant principle.

It is conspicuous that the information about his knowledge is again revealed in the email exchange that is posted at the end of “*Iron Burns!!!*” but not in the actual argument. Ferran’s published emails contain further remarks that are suitable to prove his knowledge with respect to furnace technologies. He knows that effective preheating works with the exclusion of air (see in the quote below the terms: “*and then expose it to oxygen*”, “*before it combines with oxygen*”, “*before exposing it to air*”), and he knows that furnace technology is necessary to melt steel with jet fuel (**quotes**¹⁷⁷):

Furthermore, there is no such thing as a "maximum temperature" for the combustion of any dry fuel. If you raise the temperature of a dry fuel, like paper, or wood paneling, or . . . , and then expose it to oxygen, its temperature will INCREASE, not remain the same. Duh!!! The bigger the furnace, the higher the temperature of the unburned fuel gets before it combines with oxygen, and thus still higher will its temperature be when it finally combusts.

If you construct a large enough furnace in which the temperature of the liquid fuel itself will be increased to its boiling point and then further heat the fuel vapor before exposing it to air, then there is no limit upon the temperature that may be attained by burning kerosene (Jet fuel) except that the fuel will decompose into carbon at some high temperature (and thus cease to be that fuel). A pure-carbon (charcoal) fire is very capable of melting steel. If you super-heat jet fuel, you can get pure carbon and hydrogen anyway. So, depending on the size and configuration of the furnace, you can melt iron with jet fuel. I do not believe that flaming jet fuel literally melted any iron in the WTC towers. No one with any intelligence does.

If you know that effective preheating of fuel works with the exclusion of oxygen, and if you know that materials have a temperature of spontaneous ignition, and if you know that it needs furnace technology to melt steel with jet-fuel, which is a high quality fuel, than you cannot honestly believe that burning office contents randomly in dust covered collapse piles would turn “*the debris field of the WTC*” into “*an oven of steel-melting intensity*”. Ferran’s publication on debunking911.com is disinformation.

¹⁷⁷ Quoted from “*Iron Burns!!!*”

NIST: manipulating language and a stated lack of interest

Manipulating language

It was shown above that the suggestion in the NIST fact sheet (**quote¹⁷⁸**) “*Under certain circumstances it is conceivable for some of the steel in the wreckage to have melted after the buildings collapsed.*” is inconsistent with any experience the discipline of iron metallurgy can offer regarding furnace technologies. NIST’s suggestion is also inconsistent with the fact that melting steel was once a technical challenge. It is also inconsistent with the heat release tests carried out by NIST itself. Furthermore, the suggestion by NIST that steel might have melted at Ground Zero “*due to the high temperature resulting from long exposure to combustion within the pile*” violates the second law of thermodynamics if you do not have temperatures above the melting point of steel in the first place.

But the statement by NIST is unlikely to be the result of careless writing. To the contrary, it can be shown that NIST’s statement on the fact sheet features several artful details:

(1) The responsibility for explaining the “molten steel” phenomenon, in accordance with the official account, is passed on to the reader

If you make an extraordinary claim you normally add some explanations and/or additional information in order to support it. That it was “*conceivable for some of the steel in the wreckage to have melted after the buildings collapsed*” is such an extraordinary claim that it would need some explanations to be of any value. However, NIST neither specifies nor explains the “*certain circumstances*” that might have made it possible that “*some of the steel in the wreckage to have melted after the buildings collapsed*”. It is up to the reader’s imagination to provide an explanation for the “*certain circumstances*”.

(2) NIST does not claim that it was reasonable to assume that steel might have melted in the collapse piles. NIST merely claims that steel melting in WTC collapse pile fires was more likely than something that has, based on known facts, a likelihood of occurrence of close to zero.

NIST claims that steel melting in the WTC collapse piles was “*conceivable*” under “*certain circumstances*”. The obvious question is how likely was it that “*certain circumstances*” generated conditions in WTC collapse piles by chance that are equivalent to the conditions generated by the advanced technologies used in iron metallurgy to melt steel? NIST seems to have been aware of this because they offer a statement regarding the likelihood of steel melting in collapse piles with the very next sentence in their fact sheet (**quote¹⁷⁹**):

“*Any molten steel in the wreckage was more likely due to the high temperature resulting from long exposure to combustion within the pile than to short exposure to fires or explosions while the buildings were standing* “

¹⁷⁸ Quoted from the fact sheet “National Institute of Standards and Technology (NIST) Federal Building and Fire Safety Investigation of the World Trade Center Disaster Answers to Frequently Asked Questions”; part of the answer to the fact sheet question: “13. Why did the NIST investigation not consider reports of molten steel in the wreckage from the WTC towers?” http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm

¹⁷⁹ Quoted from the NIST fact sheet (see above), part of the answer to question 13. (see above); http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm

NIST does not state the likelihood of steel melting in WTC collapse piles on an absolute scale, but compares the likelihood of three assumptions. The likelihood of assumption (A): melting “*due to the high temperature resulting from long exposure to combustion within the pile*” is compared to the likelihood of assumption (B): melting due “*to short exposure to fires [...] while the buildings were standing*”, and to the likelihood of assumption (C) melting due “*to explosions while the buildings were standing*”.

The likelihood that steel melted due “*to short exposure to fires [...] while the buildings were standing*” was close to zero. NIST knows this. NIST states, **quote**¹⁸⁰:

“The melting point of steel is about 1,500 degrees Celsius (2,800 degrees Fahrenheit). Normal building fires and hydrocarbon (e.g., jet fuel) fires generate temperatures up to about 1,100 degrees Celsius (2,000 degrees Fahrenheit). NIST reported maximum upper layer air temperatures of about 1,000 degrees Celsius (1,800 degrees Fahrenheit) in the WTC towers (for example, see NCSTAR 1, Figure 6-36).”

So NIST merely says with the first comparison that steel melting “*due to the high temperature resulting from long exposure to combustion within the pile*” was more likely than something that has, based on known facts, a likelihood of occurrence of close to zero.

The likelihood that steel melted due “*to explosions while the buildings were standing*” was close to zero too. There does not seem to exist a single definition of the term “explosion” that everyone would agree with, so the following compilation of definitions from the website of the Eastern Kentucky University (“The Fire and Safety Engineering Technology Program”) is used here (**quote**¹⁸¹):

A. General Theory, Definitions

1. Explosion



There are a variety of definitions that have been applied to the term explosion and while each of them are correct, they are based on the community that uses the term.

a. Explosion. The sudden and rapid production and escape of gases from a confined space accompanied by heat, shock & a noise.

b. Explosion. The sudden conversion of potential energy (chemical or mechanical) into kinetic energy with the production and release of gases under pressure, or the release of gas under pressure. These high-pressure gases then do mechanical work such as moving, changing, or shattering nearby materials. (NFPA-921, 1998 Edition)

¹⁸⁰ Quoted from: NIST fact sheet http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm, answer to 7a.

¹⁸¹ <http://www.fireandsafety.eku.edu/VFRE-99/Theory/Definitions/definitions.htm>.

c. Explosion. An explosion is a large-scale, noisy, rapid expansion of matter into a volume much greater than its original volume. This can be achieved by

- (1.) bursting a vessel containing a pressurized fluid;
- (2.) rapid heating of air and plasma by an electric arc;
- (3.) a very fast burning reaction; or
- (4.) detonating an explosive material.

(Introduction to the Technology of Explosives; Cooper, Paul W. and Kurowski, Stanley R.)

d. Explosion. Under the fire and explosion investigation definition, an explosion is a physical reaction characterized by the presence of four major elements or criteria:

- (1.) Rapid Increase in Gas Pressure (Gas Dynamic)
- (2.) Confinement of the Pressure
- (3.) Rapid release of that Pressure
- (4.) Damage or Change to the confining structure of the vessel

"Noise is not an element"

"Explosion Investigation and Analysis, Kennedy on Explosions"; Kennedy, Patrick M. and Kennedy, John P15-16

While this definition is more of an analysis of the results it does provide the user with an understanding of the key components of an explosion and it is useful in both response considerations and investigation.

e. Explosion. A chemical or mechanical action resulting in a sudden bursting accompanied by a loud noise.

f. Explosion. A rapid expansion of gases.

g. Explosion. Simply, a loud boom and a sudden going away of things from where they have just been!

The terms "heat" or "high temperatures" are not even mentioned in five of the seven definitions¹⁸². Heat is relevant in that heat related processes can cause an explosion¹⁸³, and "heat" might also accompany an explosion. Relevant to the discussion of NIST's statement is that any thermal energy that might cause an explosion will be partially converted into kinetic energy (causing the pressure pulse), and that any 'accompanying heat' that is left will be rapidly dissipated by the pressure pulse in the three dimensions of the space. This rapidly dissipated heat carries the thermal energy, theoretically available to melt steel by means of an explosion. Given that explosions are very short processes, and given that the heat capacity of air is low compared to the relatively high amounts of thermal energy necessary to raise the

¹⁸² The definitions "b", "d", "e", "f", "g" do not mention "heat" or "high temperatures". Definition "a" mentions "heat" as something that accompanies an explosion, definition "c" mentions "rapid heating" and "a very fast burning reaction" as options to achieve the "large-scale, noisy, rapid expansion of matter ...".

¹⁸³ Why certain exothermic reactions can result in explosions is explained in chemistry textbooks and encyclopedias. See, for example, "Physical Chemistry" by P.W. Atkins, Third Edition, Oxford University Press, page 720; or the article "oxidation-reduction reaction", Encyclopædia Britannica Online. 2 2007 <http://www.britannica.com/eb/article-49305>.

temperature in steel, it follows that extremely high temperatures in the air are required to melt steel in quantities that can give rise to visible amounts or even “pools” of molten steel. But if you have an explosion that features extremely high temperatures in the air you have an extremely strong pressure pulse too. There were pre-collapse pressure pulses in both WTC 1 and WTC 2 that may have been caused by “*explosions while the buildings were standing*”. NIST discusses this pre-collapse pressure pulse phenomenon and states: “*The pressure changes required to generate such puffs are not large and can be generated by events that result in relatively small volume changes [...]*”¹⁸⁴. It follows that if the pressure pulses, which NIST describes, were due to explosions, the accompanying heat would not have been sufficient to melt any steel because the pressure pulses were “*generated by events that result in relatively small volume changes*”.

“*Explosions while the buildings were standing*”, on a scale capable of melting steel, did not occur in the WTC, and NIST is aware of this. Thus NIST’s other comparison gives - like the first one - no clue about how likely steel melting in collapse piles was. NIST only states that it was more likely than something that has, based on known facts, a likelihood of occurrence of close to zero.

(3) NIST uses phrases suitable to conceal that its arguments are implausible

NIST suggests on the one hand that collapse pile fires might have melted steel (in answer to question 13), but states on the other hand that building and jet-fuel fires do not melt steel (in answer to question 7a). At least from the perspective of someone who can remember mass media statements stressing devastatingly hot burning pre-collapse WTC jet-fuel fires, both statements would not plausibly go together if they were written clearly. NIST solves this problem by using different and long-winded expressions for the same hypothetical process, the melting of steel by random fires. See NIST’s answer to question 7a on the fact sheet, (quote¹⁸⁵):

“In no instance did NIST report that steel in the WTC towers melted due to the fires. The melting point of steel is about 1,500 degrees Celsius (2,800 degrees Fahrenheit). Normal building fires and hydrocarbon (e.g., jet fuel) fires generate temperatures up to about 1,100 degrees Celsius (2,000 degrees Fahrenheit). NIST reported maximum upper layer air temperatures of about 1,000 degrees Celsius (1,800 degrees Fahrenheit) in the WTC towers (for example, see NCSTAR 1, Figure 6-36).”

Conspicuously, NIST avoids any generalized statement that the average random fire (in buildings, collapse piles or wherever) will certainly not melt steel. But even the fact that “*normal building fires and hydrocarbon (e.g., jet fuel) fires*” will not melt steel is not expressed in a direct manner: you have to compare temperatures first in order to obtain the relevant information¹⁸⁶. By using the phrase “*Normal building fires and hydrocarbon (e.g., jet fuel) fires*” NIST makes it impossible to apply the stated maximum temperatures in a straightforward manner to the WTC collapse piles fires¹⁸⁷.

¹⁸⁴ Quoted from NISTNCSTAR 1-5A 1-8pdf; Page 53 [149 of 392 in PDF].

¹⁸⁵ Quoted from the NIST fact sheet “Answers to Frequently Asked Questions”, see above, http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm; The term “*due to the fires*” refers here to the pre-collapse fires in the buildings.

¹⁸⁶ The sentence “*In no instance did NIST report that steel in the WTC towers melted due to the fires.*” is only a statement about NIST, but not a statement about fires and steel melting.

¹⁸⁷ The following statement (by an author who supports the official collapse theory) illustrates that knowledge related to combustion science is limited in the population (quote): “*The [pre-collapse] fire is the most misunderstood part of the WTC collapse. Even today, the media report (and many scientists believe) that the*

The phrasing in the answer to question 13 is completely different from the phrasing in 7a. The word “fire” is avoided. Instead the phrase “*high temperature resulting from long exposure to combustion*” is used.

The phrasing used by NIST appeals in addition to daily life experience: That steel might have melted due to “*high temperature*” sounds reasonable: high temperature will in fact melt steel if the temperature is high enough. But how “*high*” the “*high temperature*” in the WTC collapse piles might have been is the crucial question NIST omitted to answer. Similarly, the statement that a “*long exposure to combustion*” might be more likely to result in “*molten steel*” than a “*short exposure to fires*” sounds reasonable too: it appeals to the daily life experience that heat transfer needs time. You have to remember the second law of thermodynamics and you have to ask if the temperatures were high enough to melt steel if you want to avoid to be misguided by NIST’s reasonable sounding phrases, in which the actual problem is artfully omitted.

NIST’s stated lack of interest

NIST also states in regard to “molten steel” in the fact sheet (**quote**¹⁸⁸):

“13. Why did the NIST investigation not consider reports of molten steel in the wreckage from the WTC towers?”

NIST investigators and experts from the American Society of Civil Engineers (ASCE) and the Structural Engineers Association of New York (SEONY)—who inspected the WTC steel at the WTC site and the salvage yards—found no evidence that would support the melting of steel in a jet-fuel ignited fire in the towers prior to collapse. The condition of the steel in the wreckage of the WTC towers (i.e., whether it was in a molten state or not) was irrelevant to the investigation of the collapse since it does not provide any conclusive information on the condition of the steel when the WTC towers were standing.

NIST considered the damage to the steel structure and its fireproofing caused by the aircraft impact and the subsequent fires when the buildings were still standing since that damage was responsible for initiating the collapse of the WTC towers. [...]

NIST’s lack of interest is strange for several reasons.

NIST examined the *steel in the wreckage of the WTC towers*, and NIST states in its report clearly that it attempted to “*determine the temperature excursions experienced by the steel*

steel melted. It is argued that the jet fuel burns very hot, especially with so much fuel present. This is not true. Part of the problem is that people (including engineers) often confuse temperature and heat. While they are related, they are not the same. Thermodynamically, the heat contained in a material is related to the temperature through the heat capacity and the density (or mass). Temperature is defined as an intensive property, meaning that it does not vary with the quantity of material, while the heat is an extensive property, which does vary with the amount of material. One way to distinguish the two is to note that if a second log is added to the fireplace, the temperature does not double; it stays roughly the same, but the size of the fire or the length of time the fire burns, or a combination of the two, doubles.” Quoted from , <http://www.tms.org/pubs/journals/JOM/0112/Eagar/Eagar-0112.html> , “Why Did the World Trade Center Collapse? Science, Engineering, and Speculation”, by Thomas W. Eagar and Cristopher Musso, , in JOM, 53 (12), 2001, pp. 8-11.

¹⁸⁸ http://wtc.nist.gov/pubs/factsheets/faqs_8_2006.htm .

components”, and that it attempted to “*determine when the excursion occurred (pre- or post-collapse)*”, **quote**¹⁸⁹:

6.6 FIRE EXPOSURE OF THE STRUCTURAL ELEMENTS

Examination of the structural steel components for indications of fire damage is important to provide an indication of the location and intensity of the pre-collapse fires in the towers, as well as the effect of the fires on mechanical properties of the structural steel. This portion of the analysis attempts to (1) determine the temperature excursions experienced by the steel components, (2) determine when the excursion occurred (pre- or post-collapse), (3) determine if pre-collapse fires significantly affected the mechanical properties of the structural elements such that the structural integrity (load bearing capabilities) of the component may have been compromised, and (4) provide this information for input/validation of the fire and thermal models of the reconstruction of thermal and tenability environment (NIST NCSTAR 1-5). Analytical techniques used to carry out these tasks involved assessment of the condition of the primer paint, microstructure, chemistry, and hardness of the steel. A full discussion of these results can be found in Chapter 6 of NIST NCSTAR 1-3C.

NIST declares on the one hand that it was irrelevant for its investigation if there was steel “*in a molten state or not*” in the collapse piles. NIST states on the other hand that they attempted to determine the “*temperature excursions experienced by the steel components*” (based on steel saved from the collapse piles) and when (*pre- or post-collapse*) the temperature excursions occurred. You cannot determine that certain temperature excursions (namely to the melting point of steel or above) were a result of collapse piles fires based on “*the fire and thermal models ...*” that you want to validate by this determination. It would be a circular argument. A visual inspection that “*found no evidence that would support the melting of steel in a jet-fuel ignited fire in the towers prior to collapse*” is just a visual inspection but not a determination of when certain temperature excursions occurred. (Note, that NIST does not state that the *investigators and experts [...] found no evidence* for the “molten steel” phenomenon.)

Furthermore, it was part of the job of NIST to “*determine ... how the two towers collapsed*”¹⁹⁰, this includes the investigation of events after the so-called “collapse initiation” was reached, and not just events in the still standing towers.

The high temperatures and the persistence of the heat at Ground Zero was an extraordinary phenomenon that left renowned researchers puzzled. The dust study by Cahill et al. (see above Part I) aimed to elucidate potential health hazards from the WTC collapse piles dust plumes. It would have been sufficient for the authors to mention the phenomenon as a matter of fact only to meet the purposes of their study. But these authors were apparently so puzzled by the heat related “*not fully understood*” “*continuing emission of... plumes*” that they gave estimates for possible energy sources in the collapse piles – right at the beginning of the

¹⁸⁹ From NIST, NISTNCSTAR 1-3.pdf, page 94 (sheet 142 of 184 in PDF).

¹⁹⁰ NIST writes that it was “*One of the four main objectives of the National Institute of Standards and Technology (NIST) investigation of the collapse of the World Trade Center (WTC) towers ... to determine why and how the two towers collapsed.*” Here quoted from NIST NCSTAR 1-6: “*Structural Fire Response and Probable Collapse Sequence of the World Trade Center Towers*”, <http://wtc.nist.gov/oct05NCSTAR1-6index.htm>. It is not an editing mistake by NIST. It is repeated in other NIST’s publications. For example, **quote**:

The specific objectives were:

1. Determine why and how WTC 1 and WTC 2 collapsed following the initial impacts of the aircraft and why and how WTC 7 collapsed;

Quoted from NISTNCSTAR1-2.pdf, page xxvii (29 of 462 in PDF).

introduction in their published article¹⁹¹. They also discussed the heat phenomenon when they presented their study at the American Chemical Society Meeting 2003¹⁹². NIST has a “*Building and Fire Research Laboratory*”, and NIST’s home-page lists “*Building and fire research*” as one of ten core areas of the NIST Laboratories¹⁹³. NIST would have to assume that the extraordinary heat phenomenon was caused mainly by random fires to keep consistent with their own collapse theory. But NIST, in contrast to independent researchers, seems to be completely disinterested to elucidate the extraordinary “*not fully understood*” phenomenon that occurred simultaneously in three collapse piles.

NIST claims on its website to have the “*vision to lead the world in methods of measurement and prediction of the behavior of fire and its effects*”¹⁹⁴. Conspicuously, NIST never has openly shown any interest to investigate the unusual, allegedly fire related, phenomena in the WTC collapse piles.

NIST’s fact sheet as disinformation

NIST issued the fact sheet in response to the facts that the controlled demolition hypothesis and that the call for a thorough investigation of this hypothesis had become known to more and more people in 2006: “*It is for the masses who have seen or heard the alternative theory claims ...*”¹⁹⁵. NIST certainly knows that the controlled demolition hypothesis ascribes the heat phenomenon to the use of thermite. NIST refers directly to thermite in the fact sheet¹⁹⁶.

¹⁹¹ **Quote:** “*The collapse of the World Trade Center (WTC) buildings #2 (South Tower), #1 (North Tower), and #7 on September 11, 2001 is an unprecedented event in numerous ways. Yet the prompt and massive emissions of smoke and dust in the first days after the collapse were in accord with common understanding of such phenomena. However, the continuing emission of these plumes, especially after the heavy rains of September 14 and the increasingly effective efforts of fire suppression in mid- and late September, are not fully understood. Factors which are essential for an in-depth analysis are the chemical composition of the materials that could be aerosolized and the energy sources available in the collapse piles. In this regard, the kinetic energy of the two aircraft is negligible (<1%) compared to the chemical energy in the roughly 25,000 litres of fuel in each plane (some of which was burned outside the buildings). The gravitational potential energy of the collapse was capable of raising the entire mass of debris only a few degrees K. The largest energy sources available are the combustible materials present in the buildings and furnishings and a significant body of fuel, especially under WTC #7, in the form of diesel fuel for emergency electrical generators and large quantities of oil in various forms in the Consolidated Edison substation, also under WTC#7. Very high temperatures occurred in the burning floors of the buildings prior to collapse and during the first few days of active surface fires, as shown by the melting of metals. Later, infrared surveys showed surface temperatures in the collapse pile were as high as 30 K above ambient in October, and much higher subsurface temperatures were inferred from the lower portions of removed steel beams glowing red. The subsurface of the collapse piles remained hot for months despite use of massive amounts of water to cool them, with the last spontaneous surface fire occurring in mid-December.*” Quoted from: Cahill et al., “*Analysis of Aerosols from the World Trade Center Collapse Site, New York, October 2 to October 30, 2001*”, see above, pages 165f.

¹⁹² See PowerPoint presentation “*Very fine aerosols from the World Trade Center collapse piles: Anaerobic Incineration?*”, by Cahill et al, see above, slide 18. Note that large amounts of the diesel-fuel were in fact recovered; see above, so the possible fuel supply was even smaller than estimated by Cahill et al.

¹⁹³ <http://www.nist.gov/>; July 2007

¹⁹⁴ Quoted from <http://www2.bfrl.nist.gov/projects/2007ProgramContainer.asp?BFRLProgram=AMPM>, July 2007.

¹⁹⁵ From a statement by NIST’s spokesperson Newman, in “*The New York Times*”, “*U.S. moves to debunk 'alternative theories' on Sept. 11 attacks*”, by Jim Dwyer, (here copied from <http://www.iht.com/articles/2006/09/01/news/conspiracy.php>). Published: September 1, 2006. See also media statements. For example: “*But the chatter out there is loud enough for the National Institute of Standards and Technology to post a Web "fact sheet" poking holes in the conspiracy theories and defending its report on the towers.*” Quoted from “*The Washington Post*”, “*The 9/11 conspiracy plots thicken*”, by Michael Powell, September 09, 2006.

¹⁹⁶ See question 12 from the NIST fact sheet: “*12. Did the NIST investigation look for evidence of the WTC towers being brought down by controlled demolition? Was the steel tested for explosives or thermite residues? The combination of thermite and sulfur (called thermate) "slices through steel like a hot knife through butter."*”

But, conspicuously, NIST avoids discussing thermite with respect to the “molten steel” phenomenon. Instead, NIST restricts itself to the subject ‘how to explain molten steel’ in answer to their question 13, and displays disinterest.

NIST’s comparison (“*Any molten steel in the wreckage was more likely ...*”) is able to trick you into assuming that NIST states that the official account provided a more likely explanation for the “molten steel” phenomenon than the controlled demolition hypothesis due to the use of the term “*explosions*”. However, the controlled demolition hypothesis does not propose that explosions in the WTC caused pools of molten steel; but that the use of thermite caused pools of molten iron. NIST avoids addressing the thermite hypothesis directly with respect to the “molten steel” phenomenon. Instead, NIST merely states that melting steel in WTC collapse piles was more likely than two hypothetical options for melting steel in the still standing buildings. Conspicuously, NIST chose two hypothetical options for its comparison that have both, based on known facts, a likelihood of occurrence of close to zero.

NIST’s statement is useless for anyone who seeks information about whether the “molten steel” phenomenon was explicable consistent with the official collapse theory. NIST fails to support with any evidence its statement that it was “*conceivable for some of the steel in the wreckage to have melted after the buildings collapsed*”. Moreover, NIST does not even give any definite, verifiable statement. However, NIST’s statement is ‘supported’ by the authority the institution NIST may enjoy with the sole reader. If you do not expect NIST to publish disinformation, their statement is suitable to trick you into assuming that it was reasonably likely that steel melted in the collapse piles. That NIST left the “*certain circumstances*” undisclosed makes sense from their perspective: you can try to inform yourself about a particular, clearly stated claim (and you might be able to verify or falsify such a claim straightforwardly), but it is much more difficult to come to terms with a claim that involves non specified “*certain circumstances*”. If NIST could give any sound explanation of how steel might have melted in the collapse piles it would have been reasonable for NIST to issue an accurate, meaningful statement. Significantly, they did not.

The manipulating language in NIST’s statement, which is very suitable to hide its true, limited meaning, must have been carefully crafted. It is not possible that someone generates manipulative language of such quality as in NIST’s fact sheet just by chance. That NIST uses manipulating language proves that the statement is deliberately fabricated disinformation.

NIST’s spokesperson Newman states about the impact of the NIST fact sheet, **(quote)**¹⁹⁷:
“*We realize that this fact sheet won't convince those who hold to the alternative theories that our findings are sound,*” Newman said. “*In fact, the fact sheet was never intended for them. It is for the masses who have seen or heard the alternative theory claims and want balance.*”

Why did NIST “*never intend[...]*” to write a fact sheet capable to “*convince those who hold to the alternative theories*”? Either NIST arrogantly postulates without any factual basis that all of “*those who hold to the alternative theories*” would be unable to follow conclusive arguments, or NIST is aware that they cannot produce conclusive arguments in this case. The latter possibility is consistent with NIST’s effort to fabricate disinformation with respect to the WTC. The disinformation NIST resorts to is in fact suitable to give what NIST euphemistically calls “*balance*” to people who do not have much background knowledge of

¹⁹⁷ Quoted from: “U.S. moves to debunk 'alternative theories' on Sept. 11 attacks
By Jim Dwyer *The New York Times*” (here copied from
<http://www.iht.com/articles/2006/09/01/news/conspiracy.php>), Published: September 1, 2006.

the subject and/or who do not have specialized knowledge in relevant engineering disciplines, nor experience in deciphering language that is crafted with the intention to manipulate.

The temperatures reached in certain kinds of fires, and the second law of thermodynamics are certainly matters of fact, but not matters of “*balance*”. It is not possible to give “*balance*” if the underlying question is ‘What was the energy source that caused the exceptionally high temperatures and the persistent heat at Ground Zero?’ You might also ask why NIST understands their job was to give “*balance*”, but not to give honest answers based on science and engineering. It is noteworthy that NIST is a government agency, and that, according to a statement made before the “Committee on Science, House of Representatives” by someone who assisted NIST in their WTC investigation, government lawyers interfered with NIST’s WTC investigations, **quote**¹⁹⁸: “*In my opinion, the WTC investigation by NIST falls short of expectations by not definitively finding cause, by not sufficiently linking recommendations of specificity to cause, by not fully invoking all of their authority to seek facts in the investigation, and by the guidance of government lawyers to deter rather than develop fact finding.*”

The group that authored the NIST fact sheet must have included people who have the skills to design sophisticated disinformation. But skills in designing manipulative language are not the kind of qualification one expects from specialists in combustion science, metallurgy and structural engineering.

¹⁹⁸ Quoted from: *THE INVESTIGATION OF THE WORLD TRADE CENTER COLLAPSE: FINDINGS, RECOMMENDATIONS, AND NEXT STEPS* HEARING BEFORE THE COMMITTEE ON SCIENCE, HOUSE OF REPRESENTATIVES, STATEMENT BY James G. Quintiere, The John L. Bryan Professor, Fire Protection Engineering, University of Maryland, 2006
http://commdocs.house.gov/committees/science/hsy24133.000/hsy24133_of.htm.

Disinformation in mass media

The political importance of the official government account of 9-11 is beyond question. Despite of this it is difficult to find in most of the established mass media¹⁹⁹ any serious reporting about the issues that are left unexplained by the official account (such as the exceptionally high temperatures and the persistent heat at Ground Zero). One may argue that this lack of reporting is due to a lack of facts, no facts existed, only “unproven conspiracy theories”. But the exceptionally high temperatures and the persistent heat at Ground Zero are matters of fact (see above Part I); and the existence of statements and other sources relating to “molten steel” at Ground Zero is a matter of fact as well²⁰⁰. It is not surprising that authors of disinformation fabricated to be distributed in the established mass media show little interest in including information in their pieces that is otherwise rarely mentioned in these media. In line with this they typically cover the subject ‘high temperatures/persistent heat at Ground Zero, ascribed to thermite’ just by implication. Although the articles discussed below do not explicitly name the high temperature/persistent heat phenomenon they clearly deal with the subject implicitly. They try to convince the audience that it would be a waste of time to pay any attention to the broader issue, i.e., the controlled demolition hypothesis, or more generally, the questioning of the official account of 9-11.

Three U.S. and three European mass media articles are discussed below. Four of them use the strategy to dispute that questioning the official account of 9-11 can have any scientific character. The other two feature a discussion of ‘molten steel’ that is unrelated to the Ground Zero phenomenon.

Articles by Associated Press, “The Washington Post”, “The Nation”, and “The Telegraph”/ U.K.

Four articles are discussed in this subsection: an article by Associated Press (which was widely distributed by mainstream media, for example, by CNN, FOX News, CBS News, ABC, “The Washington Post”) and articles by “The Washington Post” (also distributed in “The Seattle Times” and on MSNBC), by “The Nation”²⁰¹, and by “The Telegraph U.K.” (a U.K. daily paper with ‘quality’ status). See some excerpts from the four articles.

Excerpts²⁰² from the article “9/11 Conspiracy Theorists Thriving 5 Years Later, Sept. 11 Conspiracy Theorists Say They're Gaining Momentum”, by Justin Pope, Associated Press:

¹⁹⁹ The terms ‘mass media’ and ‘mainstream media’ are used here for media like nationwide newspapers, news magazines and television stations that are well known and that account for the so-called media agenda.

²⁰⁰ The existence of these sources is a matter of fact. The significance of these sources is disputed (e.g. by Blanchard/Protec, see below), but up to now there exists no conclusive analysis that would satisfactorily show that it would be legitimate to disregard all “molten steel” sources.

²⁰¹ The “The Nation” is known for publishing ‘opinion’ pieces. The article from “The Nation” would not have been included in the discussion were it not for two relevant aspects: The ‘opinion’ in the article is limited to the reasons for the “*persistent appeal of paranoid theories*”. But the (alleged) link between “conspiracy theories” and “paranoia” is presented as a matter of fact. Moreover, the readers, who are presented with this alleged ‘matter of fact’, cannot easily find unbiased reports on the subject ‘questioning the official account of 9-11’ in established mass media that allowed them to form their own opinion based on facts. Instead of offering guidance on how to interpret what is reported in the mass media, the article in “The Nation” replaces unbiased reporting; a fact certainly known to the editor of “The Nation” and to the author of the article.

²⁰² See, for example, FOX News,

<http://www.foxnews.com/wires/2006Aug06/0.4670,Sept11Conspiracies.00.html>, August 06 2006), and CBS News (<http://www.cbsnews.com/stories/2006/08/07/ap/national/mainD8JBB7PG0.shtml>, August 07 2006), “The

“Aug 6, 2006 (AP)— Kevin Barrett believes the U.S government might have destroyed the World Trade Center. Steven Jones is researching what he calls evidence that the twin towers were brought down by explosives detonated inside them, not by hijacked airliners.

These men aren't uneducated junk scientists: [...]

Five years after the terrorist attacks, a community that believes widely discredited ideas about what happened on Sept. 11, 2001, persists and even thrives. [...]

The organization [Scholars for 9 11 Truth] says publicity over Barrett's case has helped boost membership to about 75 academics. They are a tiny minority of the 1 million part- and full-time faculty nationwide, and some have no university affiliation. Most aren't experts in relevant fields. But some are well educated, with degrees from elite universities such as Princeton and Stanford and jobs at schools including Rice, Indiana and the University of Texas. [...]

What really happened, the national Sept. 11 Commission concluded after 1,200 interviews, was that hijackers crashed planes into the twin towers. The National Institute of Standards and Technology, a government agency, filed 10,000 pages of reports that found fires caused by the crashing planes were more than sufficient to collapse the buildings. [...]

The standards and technology institute, and many mainstream scientists, won't debate conspiracy theorists, saying they don't want to lend them unwarranted credibility.

But some worry the academic background of the group could do that anyway.

Members of the conspiracy community "practically worship the ground (Jones) walks on because he's seen as a scientist who is preaching to their side," said FR Greening, a Canadian chemist who has written several papers rebutting the science used by Sept. 11 conspiracy theorists. "It's science, but it's politically motivated. It's science with an axe to grind, and therefore it's not really science."

Faculty can express any opinion outside the classroom, said Roger Bowen, general secretary of the American Association of University Professors. However, "with academic freedom comes academic responsibility. And that requires them to teach the truth of their discipline, and the truth does not include conspiracy theories, or flat Earth theories, or Holocaust denial theories."

Members of the group don't consider themselves extremists. [...]

But when asked what did happen in 2001, members often step outside the rigorous, data-based culture of the academy and defer to their own instincts.[...]

When they do cite evidence, critics such as Greening contend it's junk science from fellow conspiracy theorists, dressed up in the language and format of real research to give it a sense of credibility.

Jones focuses on the relatively narrow question of whether molten metal present at the World Trade Center site after the attacks is evidence that a high-temperature incendiary called thermite, which can be used to weld or cut metal, was involved in the towers' destruction. He concludes thermite was present, throwing the government's entire explanation into question and suggesting someone might have used explosives to bring down the towers.

"I have not run into many who have read my paper and said it's just all hogwash," Jones said.

[...]

In fact, say Greening and other experts, the molten metal Jones cites was most likely aluminum from the planes, and any number of explanations are more likely than thermite.

And the National Institute of Standards and Technology's report describes how the buildings collapsed from the inside in a chain reaction once the floors began falling.

"We respect the opinions of others, but we just didn't see any evidence of what people are claiming," institute spokesman Michael Newman said. [...]

"The general public from Maine to Oregon knows why the trade towers went down," said state Rep. Stephen Nass, a Republican. "It's not a matter of unpopular ideas; it's a matter of quality education and giving students their money's worth in the classroom." [...]

On the Net:

Scholars for Truth: <http://www.scholarsfor911truth.org/>

Nat'l Institute of Standards: <http://wtc.nist.gov/>

Debunking Conspiracy Theories: <http://www.debunking911.com/>

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Excerpts²⁰³ from the article “*The CIA couldn't have organised this...*

The geopolitical blunders that have followed 9/11 are the best evidence yet that there was no government conspiracy”, by Michael Shelden, published in “The Telegraph”, UK, 08/09/2006:

“[...] Of course, this is not the first time such a conspiracy theory has been put forward. Most have been dismissed but many in the American media appear to be taking these claims more seriously. Clearly, none of the journalists concerned was present at the seminars Jones gave last month at his Mormon university - Brigham Young, in Provo, Utah - where he aired some of his other favourite ideas.

Jones is convinced, for example, that Jesus was wandering through ancient Mexico around AD 600, paying calls on various Mayan villagers. He has published "evidence" that the Mayans were well aware of the "resurrected Lord" centuries before the Spanish priests crossed the Atlantic and gave them the Good News.

²⁰³ Quoted from telegraph.co.uk,
<http://www.telegraph.co.uk/arts/main.jhtml?xml=/arts/2006/09/08/ftterror08.xml>

And, for the past 10 years, Professor Jones has also been trying to sell Third World countries a solar funnel cooker based on the highly disputed scientific theory of cold fusion.

The cooker doesn't appear to have caught on. But Jones is having much better luck with his 9/11 conspiracy theories. [...]

The Ohio University poll provides one clue. It found that the people who were most likely to believe in the 9/11 conspiracies were those who "regularly use the internet but who do not regularly use "mainstream" media". Alone in a darkened room with paranoid cyber-friends as your only company, you can easily begin to entertain all sorts of bizarre notions, especially when trying to make sense of an event as grotesque as the collapse of two skyscrapers.

And, after five years of seeing the event constantly replayed, many people have obviously become detached from the reality of the terror, and are ripe for imagining that it is a kind of computer-generated spectacle engineered by a fiendish team of Dr Strangeloves.

But what about those other professors supporting Jones's cause? Surely, they can't all be misguided. In such a large group of "leading academics" - as one newspaper called them - there must be a few who have solid proof of a conspiracy.

Don't bet on it. Most of them aren't scientists but instructors in the liberal arts at second-rate colleges who have spent much of their careers tilting at various windmills.[...]

Like the Holocaust, the tragedy of 9/11 is such an incomprehensible tragedy that it was bound to lead some people into denying the obvious. But the Bush administration has inadvertently given Jones and his followers encouragement by doing so much of its work in secret and by giving the public so many false stories. The paranoia of one group has been fed by the arrogance of the other. [...]

Michael Shelden is professor of English at Indiana State University."

Excerpts²⁰⁴ from the article “*The 9/11 conspiracy plots thicken*”, by Michael Powel, “The Washington Post”, September 09, 2006:

“[...] "To me, the [9/11 Commission] report read as a cartoon," Griffin said. "It's a much greater stretch to accept the official conspiracy story than to consider the alternatives."

Such as?

"There was massive complicity in this attack by U.S. government operatives."

If that feels like a skip off the cliff of established reality, more Americans are in free fall than you might guess. [...]

A recent Scripps Howard/Ohio University poll of 1,010 Americans found that 36 percent suspect the U.S. government promoted the attacks or intentionally sat on its hands. Sixteen percent believe explosives brought down the towers. Twelve percent believe a cruise missile hit the Pentagon.

²⁰⁴ This article, originally from the Washington Post (http://www.washingtonpost.com/wp-dyn/content/article/2006/09/07/AR2006090701669_pf.html), was distributed by other major media too. See MSNBC: <http://www.msnbc.msn.com/id/14723997/>, and “The Seattle Times”: <http://archives.seattletimes.nwsource.com/cgi-bin/texis.cgi/web/vortex/display?slug=911conspire09&date=20060909&query=%22michael+powell%22> (abridged version).

Distrust percolates more strongly near Ground Zero. A Zogby International poll of New York City residents two years ago found 49.3 percent believed the government "consciously failed to act."

You could dismiss this as a louder than usual howl from the CIA-controls-my-thoughts-through-the-filling-in-my-molar crowd. Establishment assessments of the believers tend toward the psychotherapeutic. Many academics, politicians and thinkers left, right and center say the conspiracy theories are a case of one plus one equals five. It's a piling up of improbabilities. [...]

The loose agglomeration known as the "9/11 Truth Movement" has stopped looking for truth from the government. As cacophonous and free-range a bunch of conspiracists anywhere this side of Guy Fawkes, they produce hip-hop inflected documentaries and scholarly conferences. The Web is their mother lode. Every citizen is a researcher. There's nothing like a triple, Google-fed epiphany lighting up the laptop at 2:44 a.m. [...]

Peter Knight, senior lecturer in American studies at the University of Manchester and editor of the 2002 book "Conspiracy Nation: The Politics of Paranoia in Postwar America," called the movement "a strange beast, an amalgam of elements. [...]"

The movement's de facto minister of engineering is Steven Jones, a tenured physics professor at Brigham Young University who has studied vectors and velocities and tested explosives and concluded that the collapse of the twin towers is best explained as controlled demolition, sped by a thousand pounds of high-grade thermite.

Jones has been placed on paid leave while the Mormon-church-owned school investigates his claims, it was announced Friday.[...]

So give the truth movement, many of whom are based in New York City, their props. They may be paranoid, but something nasty came our way. [...]

There is a "morning after" quality to the conspiratorial romance. One moment you groove on the epiphanies and the next moment you're lost in a dull haze of "this cannot be a coincidence," "perhaps significantly" and "if so . . ."[...]

Chip Berlet, senior analyst at Political Research Associates, a Boston-based left-leaning think tank, is no fan of the 9/11 Commission. [...]

But he has no patience with the conspiracy theorists.

"They don't do their homework; it's a kind of charlatanism," Berlet says over the phone. [...]
Now comes a loud sigh.

"I love 'The X-Files' but I don't base my research on it," he says. "My vision of hell is having to review these [conspiracy] books over and over again."

Let's move on to Eager of MIT. "Demolition experts say, 'Ohhh, it's all science and timing.' Bull!" Eager says. "What's the technique? If 200,000 tons gives way, where do you think it's going? Straight down."

In the days after Sept. 11, experts claimed temperatures reached 2,000 degrees on the upper floors. Others claimed steel melted. Nope. What happened, Eager says, is that jet fuel sloshed around and beams got rubbery.

"It's not too much to think that you could have some regions at 900 degrees and others at 1,200 degrees, and that will distort the beams."

Excerpts²⁰⁵ from the article "9/11: The Roots of Paranoia", by Christopher Hayes, published in "The Nation", December 2006:

"[...] As these theories--propounded by the so-called 9/11 Truth Movement--seep toward the edges of the mainstream, they have raised the specter of the return (if it ever left) of what Richard Hofstadter famously described as "the paranoid style in American politics." But the real danger posed by the Truth Movement isn't paranoia. Rather, the danger is that it will discredit and deform the salutary skepticism Americans increasingly show toward their leaders. [...]

Two of these academics, retired theologian David Ray Griffin and retired Brigham Young University physics professor Steven Jones, have written books and articles that serve as the movement's canon. Videos of their lectures circulate among the burgeoning portions of the Internet devoted to the cause of the "truthers." A variety of groups have chapters across the country and organize conferences that draw hundreds. [...]

Critics like The New Yorker's Nicholas Lemann might lament the resurgence of the "paranoid style," but the seeds of paranoia have taken root partly because of the complete lack of appropriate skepticism by the establishment press, a complementary impulse to the paranoid style that might be called the credulous style.[...]

The public has been presented with two worldviews, one credulous, one paranoid, and both unsatisfactory. [...] Conspiracy theories that claim to explain 9/11 are wrongheaded and a terrible waste of time, but the skeptical instinct is, on balance, salutary. [...]

Still, the persistent appeal of paranoid theories reflects a cynicism that the credulous media have failed to address, because they posit a world of good intentions and face-value pronouncements, one in which the suggestion that a government would mislead or abuse its citizens for its own gains or the gains of its benefactors is on its face absurd. The danger is that the more this government's cynicism and deception are laid bare, the more people--on the left in particular and among the public in general--will be drawn down the rabbit hole of delusion of the 9/11 Truth Movement. [...]"

All four articles intend to spread the message that questioning the official account of 9-11 cannot have any scientific character. In order to do so they use the following tactics.

(1) Dismissive, direct statements are used. These are made or chosen so that it can appear as if their use was part of unbiased reporting. The message is expressed as a matter of fact: "members often step outside the rigorous, data-based culture of the academy" (AP). Or, a

²⁰⁵ <http://www.thenation.com/doc/20061225/hayes>

discrediting statement is given that is based on some kind of authority. The discrediting statement is based on the authority of a named professional, for example: “*it's junk science from fellow conspiracy theorists, dressed up in the language and format of real research to give it a sense of credibility.*” (AP/ reference to a statement by the chemist F. R. Greening, referred to by AP as “*expert*”), or “*It's science, but it's politically motivated. It's science with an axe to grind, and therefore it's not really science.*” (AP, statement by Greening)²⁰⁶, or: “*However, ‘with academic freedom comes academic responsibility. And that requires them [faculty] to teach the truth of their discipline, and the truth does not include conspiracy theories, or flat Earth theories, or Holocaust denial theories.’*” AP, statement by “*Roger Bowen, general secretary of the American Association of University Professors*”²⁰⁷, or: “*They don't do their homework; it's a kind of charlatanism*” (Washington Post / quote by “*Chip Berlet, senior analyst at Political Research Associates*”). Or, the message is expressed by referring to groups of people with authority: “*Many academics, politicians and thinkers left, right and center say the conspiracy theories are a case of one plus one equals five.*” (Washington Post), or: “*The standards and technology institute, and many mainstream scientists, won't debate conspiracy theorists, saying they don't want to lend them unwarranted credibility.*” (AP).

(2) The subject “conspiracy theories” is associated with religion. Terminology related to religion is used to describe people who question the official account, their actions, or related subjects: *worship* (AP/ quote by Greening), *preaching* (AP/ quote by Greening), *canon* (The Nation), *devoted* (The Nation), *chapters* (The Nation), *believers* (Washington Post), *minister* (Washington Post), and *epiphany* (Washington Post). This suggests that questioning the official account can be compared to being a member of a religious sect.

(3) The questioning of the official account of 9-11 is defamed by the repeated use of terminology related to mental illness: “*Alone in a darkened room with paranoid cyber-friends as your only company, you can easily begin to entertain all sorts of bizarre notions ...*” (The Telegraph), “*The paranoia of one group ...*” (The Telegraph), “*... many people have obviously become detached from the reality ...*” (The Telegraph), “*They may be paranoid ...*” (Washington Post), “*feels like a skip off the cliff of established reality*” (Washington Post), “*You could dismiss this as a louder than usual howl from the CIA-controls-my-thoughts-through-the-filling-in-my-molar crowd. Establishment assessments of the believers tend toward the psychotherapeutic.*” (Washington Post), “*9/11: The Roots of Paranoia*” (The Nation/ headline), “*... they have raised the specter of the return (if it ever left) of what Richard Hofstadter famously described as “the paranoid style in American politics.” But the real danger posed by the Truth Movement isn't paranoia ...*” (The Nation), “*Critics like The New Yorker's Nicholas Lemann might lament the resurgence of the “paranoid style,” but the seeds of paranoia have taken root partly because of the complete lack of appropriate skepticism by the establishment press, a complementary impulse to the paranoid style ...*” (The Nation), “*The public has been presented with two worldviews, one credulous, one*

²⁰⁶ With respect to the validity of this statement see below “Rewriting science”.

²⁰⁷ Note that Bowen’s statement is inconclusive. Some academic disciplines (namely some of those that are related to the actions of human beings like history or law) inevitable have to discuss “conspiracy theories” because conspiracies happen as a matter of fact. For example, you would expect to find in an academic biography of the Russian Tsarina Katherina II a discussion of the extent of her involvement in the killing of her husband Tsar Peter III. That Katherina came to power was certainly the result of a conspiracy. Historians have been discussing different theories about this conspiracy. “Conspiracy theories” are not per definitionem unscientific. See, for example, the definition of “conspiracy theory” on the Merriam-Webster website:
: a theory that explains an event or set of circumstances as the result of a secret plot by usually powerful conspirators

Quoted from <http://www.merriam-webster.com/dictionary>.

paranoid ...” (The Nation), and “*the persistent appeal of paranoid theories ...*” (The Nation). By quoting the editor of “*the 2002 book "Conspiracy Nation: The Politics of Paranoia in Postwar America"*” who “*called the movement "a strange beast, an amalgam of elements. [...]*” (Washington Post) it is demonstrated that it was reasonable to have the subject ‘questioning the official account of 9-11’ discussed by an expert on the subject “*Politics of Paranoia*”.

(4) The qualifications of scientists who are questioning the official account of 9-11 are described as unimportant, or their reputation as serious scientists is disputed. It is stressed that “*some*” of the scientists who question the official account “*have no university affiliation.*” (AP), and that “*most*” of these scientists “*aren't experts in relevant fields*” (AP), and that “*Most of them aren't scientists but instructors in the liberal arts at second-rate colleges who have spent much of their careers tilting at various windmills*” (Telegraph). The statement “*These men aren't uneducated junk scientists*” (AP) implies that it was suggested one consider them as *uneducated junk scientists* merely due to the fact that they question the official account.

The article in “The Telegraph U.K.” states:

“And, for the past 10 years, Professor Jones has also been trying to sell Third World countries a solar funnel cooker based on the highly disputed scientific theory of cold fusion. The cooker doesn't appear to have caught on. But Jones is having much better luck with his 9/11 conspiracy theories. [...]”

The “*solar funnel cooker based on ... cold fusion*” story is unsubstantiated. But given that Jones was probably unknown to a large proportion of the “Telegraph” readers when the article was published²⁰⁸ the story will have ‘worked’ nevertheless. The likelihood that any reader will be further interested in any theories by someone who must be somewhat mad in that he tries to build a “*solar funnel cooker based on ... cold fusion*”, and who must also be mean and immoral because he tries to sell such useless stuff to poor Third World countries will be close to zero. Readers are likely to be put off from searching for independent information about the subject, thus they are unlikely to find out that they have been tricked by this “report”. It is further stated in the same article: “*Jones is convinced, for example, that Jesus was wandering through ancient Mexico around AD 600, paying calls on various Mayan villagers. He has published "evidence" that the Mayans were well aware of the "resurrected Lord" centuries before the Spanish priests crossed the Atlantic and gave them the Good News.*” It is unlikely that many readers in the U.K. know the details of the scriptural canon of the Mormons that are necessary to put this information into context, and to realize that the argument tries to ridicule someone by targeting his faith. The author of the Telegraph article is well aware of the potential effect of his malicious argument. He even spells it out so that the reader will not miss the point: “*So why is it that millions of people on both sides of the Atlantic who would scoff at Jones's theory of a Mayan Christ or pass on his offer of a solar cooker are more than happy to embrace his vague, unsupported charges of a vast conspiracy?*” (The Telegraph)

The four mass media articles as disinformation

The line of attack to defame the questioning of the official account of 9-11 as unscientific, paranoid etc. certainly does not arise by chance. This line of attack is perfectly suited to tackle the fact that in 2006 it increasingly became public to the U.S. population that scientists were

²⁰⁸ The Telegraph article was probably only the third mention of Jones in any U.K. mass media. The two other articles were published just two and three days earlier on September 5th and 6th 2006 (see [Who really blew up the twin towers?](#), Guardian, September 5 2006, by Christina Asquith; see next footnote below for the Daily Mail article).

questioning the official account of 9-11, using arguments based on science and engineering²⁰⁹. This explanation does not apply to the Telegraph article, but the reason that the “The Telegraph” adopted the strategy for the U.K. audience is easy to guess. One of the biggest U.K. daily papers, the “Daily Mail”, had published an article about “*leading scientists*” who “*say [that] they have evidence that points to one of the biggest conspiracies ever perpetrated*”²¹⁰. The Telegraph article addresses the fact that a part of the U.K. audience was informed by the “Daily Mail” that scientists (particularly “*leading scientists*”) were questioning the official account of 9-11. The article, which features Jones as selling “*solar funnel cooker based on ... cold fusion*”, was published two days after the “Daily Mail” article, and refers to it: “*In such a large group of "leading academics" - as one newspaper called them - there must be a few who have solid proof of a conspiracy.*”

It would, for example, not be reasonable to claim that an article was “disinformation” based merely on the fact that the author links the terms “9-11 conspiracy theories” and “paranoid” in the article; it might mirror the genuine opinion of the author. But none of the discrediting and defaming statements, compiled above, was presented as the opinion of the author. It cannot have arisen just by chance that there are in only four articles so many terms and statements suited to discredit and defame the science based questioning of the official account of 9/11. Instead, it has to be assumed that the articles are intentionally fabricated disinformation. This conclusion is further supported by other features contained in the articles:

Stirring up emotions: Many readers will outright reject any subject that is connected to the subject *Holocaust denial*. A ‘connection’ between *Holocaust denial* and the so-called “*conspiracy theories*” is constructed by using both in the same sentence (see Roger Bowen’s statement in the AP article). The Telegraph U.K. article does it inconspicuously, which always ‘works’ well for disinformation purposes: “*Like the Holocaust, the tragedy of 9/11 is such an incomprehensible tragedy that it was bound to lead some people into denying the obvious.*”

‘Backhanded compliment’: One of the most sophisticated disinformation tricks used in the four articles is the statement from the AP-article: “*Members of the group don't consider themselves extremists.*” Of course, they do not. There is not any apparent connection between scientists who are questioning the official 9-11 account and extremism. If you ask yourself what kind of extremism might apply, it will prove impossible to come up with any kind of extremism that could be supported by people as diverse as the members of the group mentioned in the AP article (‘Scholars for 9-11 Truth’ in August 2006). But by stating that those scientists do not “*consider themselves extremists*” the reader is invited to question whether they are extremists. (It is a similar trick with “*These men aren't uneducated junk scientists*”, but note the difference between “*they aren't*” and “*they don't consider*”

209 **Quote**: “*In recent months, interest in September 11-conspiracy theories has surged. Since January, traffic to the major conspiracy Web sites has increased steadily. [...] Why now? Oddly enough, the answer lies with a soft-spoken physicist from Brigham Young University named Steven E. Jones [...]*” Quoted from “*Professors of Paranoia? Academics give a scholarly stamp to 9/11 conspiracy theories*”, by John Gravois, Chicago “The Chronicle of Higher Education”, Section: The Faculty, Volume 52, Issue 42, Page A10, June 23, 2006, <http://chronicle.com/free/v52/i42/42a01001.htm>.

210 The article was published in the U.K. Daily Mail: “*Fury as academics claim 9/11 was 'inside job'*” by JAYA NARAIN, 6th September 2006, (http://www.dailymail.co.uk/pages/live/articles/news/news.html?in_article_id=403757&in_page_id=1770), **quote**: “*The 9/11 terrorist attack on America which left almost 3,000 people dead was an "inside job", according to a group of leading academics. [...] But leading scientists say the facts of their investigations cannot be ignored and say they have evidence that points to one of the biggest conspiracies ever perpetrated. Professor Steven Jones, who lectures in physics at the Brigham Young University in Utah, says the official version of events is the biggest and most evil cover up in history.*”

themselves”). If you want to discredit someone such ‘polite’ sounding, indirect phrases work much better than any obvious terms of abuse.

Disguise: Disinformation works best if it is disguised. The “Telegraph” and the “Nation” articles are aimed to appear as independent by criticizing the U.S. government at length for its politics. Due to the style, which ridicules any questioning of the official account, the article in the Washington Post is clearly biased. However, because a large number of statements, facts, and alleged “facts” are provided, someone can get the impression that the article was providing independent information. The most effectively disguised disinformation article is the AP one; the author himself avoids making personal statements. Instead it appears as if he is only reporting facts and the views of other people, from a neutral point of view.

It is known that a reader is likely to consider an article as unbiased when he gets the impression that both sides get coverage. The trick used in the AP article, to appear as unbiased, but to deliver the message, is that while both sides get coverage one side is represented with expressive, biased statements, and the other with mostly insignificant statements (see the whole article). The discussion of “*molten metal present at the World Trade Center site after the attacks*” in the AP article provides an example; the seemingly unbiased discussion is carefully constructed to make sure that the reader does not get too much information and draws the desired conclusions:

The AP article introduces Jones with two sentences that conceal the controlled demolition hypothesis: *Jones focuses on the relatively narrow question of whether molten metal present at the World Trade Center site after the attacks is evidence that a high-temperature incendiary called thermite, which can be used to weld or cut metal, was involved in the towers' destruction. He concludes thermite was present, throwing the government's entire explanation into question and suggesting someone might have used explosives to bring down the towers.* In fact, Jones clearly calls for a independent scrutiny of each point the controlled demolition hypothesis is based on²¹¹. However, AP does not want any discussion of the controlled demolition hypothesis as outlined by Jones, and therefore AP does not mention the many observations and facts the controlled demolition hypothesis is based on. AP also does not want to call the attention of those readers who might still be unaware of the fact that a phenomenon of exceptionally high temperatures existed at Ground Zero. Therefore a very vague description “*molten metal present at the World Trade Center site after the attacks*” is chosen that might refer to the flow of molten metal from the South Tower only, or to the “molten steel” phenomenon at Ground Zero, or to both. AP clearly does not want a detailed discussion of the evidence that Jones presents for the controlled demolition hypothesis either; he is quoted, but only with the sentence “*I have not run into many who have read my paper and said it's just all hogwash*” This statement chosen by AP to represent Jones does not contain any real arguments to support the controlled demolition hypothesis or the proposed use of thermite, it is not a scientific statement, and it uses a very casual style. There is no shortage of statements by Jones that contain significant arguments in support of the controlled demolition hypothesis, or that outline the evidence for the use of thermite, but, obviously, AP did not want to include such a statement in its article.

On the other hand the reader learns that “*Greening and other experts*” (this makes at least three experts) say that “*In fact ... the molten metal Jones cites was most likely aluminum from the planes, and any number of explanations are more likely than thermite.*” This is a

211 See “Why Indeed Did the WTC Buildings Completely Collapse?”, by Steven E. Jones, http://www.journalof911studies.com/volume/200609/Why_Indeed_Did_the_WTC_Buildings_Completely_Collapse_Jones_Thermite_World_Trade_Center.pdf.

scientifically sounding argument. By introducing the arguments of the “*experts*” with the words “*in fact*” as a kind of ‘response’ to the proposed use of thermite you get the impression that Jones would not be able to consider “*any number of explanations*” that are “*more likely than thermite*” according to at least three “*experts*”.

To summarize, if you do not have background knowledge it appears as if the whole science based argument about the WTC collapse depends on the “*relatively narrow question of whether molten metal present at the World Trade Center site after the attacks is evidence that [...] thermite [...] was involved in the towers' destruction.*” The thermite hypothesis in turn appears to be supported mainly by the single person (Jones) who is not an “*expert*”, and who seems to be unable to consider “*any number of explanations*” the “*experts*” regard as “*more likely*” to explain the molten metal. That the Associated Press’ author ‘resorted’ to Jones “*hogwash*” statement suggests to the reader that there existed no significant statements in support of the alternative collapse theory.

This clearly comes across as something that deserves no further discussion.

The articles aim to close down any discussion about what happened on 9-11

All the articles are constructed in a manner where it is not suggested that an open public discussion about the official account of 9-11 would now be appropriate. The articles are built purposely around topics like academic freedom, the result of a Scripps Howard/Ohio University poll, or the existence of the “Scholars for 9-11 Truth”.

The main purpose of the four articles is obvious: to close down any debate about what happened on 9-11. Some statements are phrased very directly to highlight the message that questioning the official account of 9-11 was really a waste of time (**quotes**):

“What really happened, the national Sept. 11 Commission concluded after 1,200 interviews, was that hijackers crashed planes into the twin towers. The National Institute of Standards and Technology, a government agency, filed 10,000 pages of reports that found fires caused by the crashing planes were more than sufficient to collapse the buildings.” (AP)

“And the National Institute of Standards and Technology's report describes how the buildings collapsed from the inside in a chain reaction once the floors began falling.

““We respect the opinions of others, but we just didn't see any evidence of what people are claiming,” institute spokesman Michael Newman said. (AP)

“The general public from Maine to Oregon knows why the trade towers went down,” said state Rep. Stephen Nass, a Republican. [...]” (AP)

“But he [Chip Berlet] has no patience with the conspiracy theorists. [...] “I love ‘The X-Files’ but I don't base my research on it. My vision of hell is having to review these [conspiracy] books over and over again.”

Let's move on to Eager of MIT. “Demolition experts say, ‘Ohhh, it's all science and timing.’ Bull!” Eager says. “What's the technique? If 200,000 tons gives way, where do you think it's going? Straight down.”

In the days after Sept. 11, experts claimed temperatures reached 2,000 degrees on the upper floors. Others claimed steel melted. Nope. What happened, Eager says, is that jet fuel sloshed around and beams got rubbery.

“It's not too much to think that you could have some regions at 900 degrees and others at 1,200 degrees, and that will distort the beams.”” (Washington Post)

“The problem isn't with conspiracy theories as such; the problem is continuing to assert the existence of a conspiracy even after the evidence shows it to be virtually impossible.

In March 2005 Popular Mechanics assembled a team of engineers, physicists, flight experts and the like to critically examine some of the Truth Movement's most common claims. They found them almost entirely without merit. To pick just one example, steel might not melt at 1,500 degrees, the temperature at which jet fuel burns, but it does begin to lose a lot of its strength, enough to cause the support beams to fail.

And yet no amount of debunking seems to work. The Internet empowers people with esoteric interests to spend all kinds of time pursuing their hobbies, and if the Truth Movement was the political equivalent of Lord of the Rings fan fiction or furrries, there wouldn't be much reason to pay attention.” (quoted from “The Nation”, see above)

“Conspiracy theories that claim to explain 9/11 are wrongheaded and a terrible waste of time, but the skeptical instinct is, on balance, salutary.” (The Nation)

The Telegraph does not need any such statements given that the audience learns that Jones' arguments were anyway just “*vague, unsupported charges of a vast conspiracy*” (The Telegraph).

Articles by the BBC and “Der Spiegel”

Two articles are discussed in this subsection. “*9/11: The Conspiracy Files*” by the BBC consists of several texts on the BBC website related to the broadcast “*The Conspiracy Files*”. The article “*September 11, 2001, Five Years Later*” was first published in a special 9-11 issue of the German news magazine “Der Spiegel” (the English “*International Edition*” of this special issue is used here). “Der Spiegel” has the reputation of being one of the most influential mass media in Germany. Both, the BBC, and “Der Spiegel” claim to discuss what they call “*conspiracy theories*” in regard to 9-11. In both cases the presentation reassures the audience that they were provided with thoroughly investigated reports. See the following excerpts from the general parts of the articles by the BBC and “Der Spiegel”:

BBC, **excerpts**²¹²:

²¹² Quoted from, “*Story from BBC NEWS; Published: 2006/12/07 08:19:18 GMT; Producer: Guy Smith.*” The excerpt here and below are screen shots from : “Episode guide” http://news.bbc.co.uk/1/hi/programmes/conspiracy_files/6160775.stm; “The 9/11 conspiracy movement”, http://news.bbc.co.uk/1/hi/programmes/conspiracy_files/6354679.stm, and **9/11: Q&A** → http://news.bbc.co.uk/1/hi/programmes/conspiracy_files/6341851.stm.

9/11: The Conspiracy Files

We all know what happened on 9/11, the day the world changed. Or do we?

The Conspiracy Files investigates the growing number of conspiracy theories surrounding the 9/11 attacks.

Incredibly some believe the American Government allowed or actively helped the attacks on the World Trade Center and the Pentagon.

Those who question the official version believe the World Trade Center buildings were actually demolished by explosives;



◆ 9/11: The Conspiracy Files
◆ BBC Four, Sun 3 June, 8pm

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THE CONSPIRACY FILES



Conspiracy test

Find out how conspiratorial you are by taking our test

- ▶ Editors' blog: Conspiracy theory
- ▶ Why we love conspiracy theories
- ▶ Plots, paranoia and blame
- ▶ The psychology of conspiracy

OKLAHOMA BOMB

- ▶ Episode guide
 - ▶ Call to reopen Oklahoma case
 - ▶ Q&A: What really happened
 - ▶ Timeline: Oklahoma bomb
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DAVID KELLY

- ▶ Episode guide
- ▶ Kelly death not suicide, says MP
- ▶ Q&A: What really happened

[...]

The Conspiracy Files travels across the United States to investigate, speaking to eye witnesses and tries to separate fact from fiction.

[...]

The Conspiracy Files investigated the many questions that have been raised to find out what really happened on 9/11. You can read the results of that research by clicking on the links below.

[...]

Q&A: What really happened



The official version, the conspiracy theories and the evidence surrounding the 9/11 attacks.

“Der Spiegel”, excerpt²¹³:

²¹³ “WHAT REALLY HAPPENED The 9/11 Fact File”

by Dominik Cziesche, Hauke Goos, Bernhard Huebner, Ansbert Kneip, Georg Mascolo, in SPIEGEL special No. 6/2006 - International Edition, “September 11, 2001, Five Years Later”.

The 9/11 Fact File

Conspiracy theories such as those popularized in the Internet documentary *Loose Change* are all the rage. Yet they are easy to refute, using new evidence from video and audiotape recordings, statements of captured al Qaeda members and the reports of commissions investigating the events.

[...]

Many of the questions posed by 9/11 can be answered more thoroughly and precisely today, allowing quite a few of the conspiracy theories to be debunked.

[...]

The substantial amount of new information available now, five years after the attacks, is inviting a re-examination of the events of the day. Some findings merely confirm what we already knew, but add layers of fresh detail. Others shift the focus, including the exact role played by Osama bin Laden. And much is new, including the dramatic final minutes of UA 93.



DER SPIEGEL

SPIEGEL special No. 6/2006 - International Edition

September 11, 2001
Five Years Later

The article was available on the internet in a weekly edition in December 2006 that is used here. The German version was published in "Spiegel special 6/2006", September 07, 2006,

<http://www.spiegel.de/spiegelspecial/0,1518,435547,00.html/german>.

This excerpt: <http://www.spiegel.de/international/spiegel/0,1518,451741,00.html> (if this address does not work start with the next page/part: <http://www.spiegel.de/international/spiegel/0,1518,451741-2,00.html> and go "back").

The controlled demolition hypothesis of the WTC is one of several key issues when the official 9-11 account is questioned. In other words it is one of several key issues of the “9-11 conspiracy theories” that are ostensibly discussed in the articles by the BBC and “Der Spiegel”. Articles and reports, that claim to thoroughly investigate “9-11 conspiracy theories”, should deal with the controlled demolition hypothesis. But the articles only deal with two elements of the controlled demolition hypothesis explicitly: with the squibs visible during the collapses (“*lateral puffs of smoke*”/ “*television pictures do show minor explosions as the structures collapse*”) and with the collapse of WTC 7. In both cases the audience is simply reassured that the phenomena were consistent with the official account by referring to explanations by NIST, FEMA, and Popular Mechanics, and by referring to a still not published official report about the collapse of WTC 7.

The line of reasoning about “molten steel” in the controlled demolition hypothesis says that “molten steel” at Ground Zero was inconsistent with the official account because neither pre-collapse fires nor collapse pile fires burnt hot enough to melt steel. The “molten steel at Ground Zero” phenomenon is not dealt with in the articles by the BBC and “Der Spiegel”. But in both articles a “molten steel” issue is discussed that is related to the question ‘were the pre-collapse jet fuel fires hot enough to melt steel?’. See the following excerpts.

The BBC, **quote**:

Were the Twin Towers deliberately demolished by explosives?

After 9/11, investigations by the **Federal Emergency Management Agency (FEMA)** and the **National Institute of Standards and Technology (NIST)** determined that the collapse of the Twin Towers was due to the impact of the planes and the large quantities of exploding jet fuel released into the buildings.

Those questioning this account point to the lateral puffs of smoke that emerged from the towers just ahead of their collapse. Could these be explosive devices planted as part of a conspiracy?

They also argue that jet fuel, which has a far lower burning temperature than the melting point of steel, is unlikely to have weakened the steel supporting framework sufficient to prompt the collapse of the Twin Towers.

Jet fuel burns at 800 degrees Celsius whereas temperatures must reach 1,500 degrees Celsius for steel to melt.

[...]

As for the fuel temperature - the official explanation holds that whilst steel does indeed melt at 1,500 degrees Celsius, it loses half its strength at a much lower temperature of 650 degrees Celsius.

The fuel might not have melted the steel columns, but it weakened the structure, and especially the trusses that supported each floor, to the point that they could no longer support the weight on the building.

“Der Spiegel”, excerpt²¹⁴:

Skeptics doubt that the blaze was hot enough to melt steel. They argue that jet fuel burns at a maximum of about 800 degrees Celsius. To melt steel, at least 1,500 C is required. As a consequence, they argue, fire could not have caused the collapse.

But steel doesn't have to melt completely. At 650 C, it loses 50 percent of its tensile strength. At just below 1,000 C, it loses about 90 percent, according to experts. Moreover, specialists believe that flammable materials inside - such as carpets, curtains, furniture and plastics - helped increase the temperature at the top of the towers to almost 1,000 C.

[...]

Both the BBC and “Der Spiegel” discuss the argument ‘the Towers cannot have collapsed without fires hot enough to melt steel’ instead of the relevant argument ‘impact damage and fires alone cannot account for the collapses’. This works nicely if your audience does not have much background knowledge, and it kills two birds with one stone: the chosen argument is easily “debunked”, and something that features the terms “molten steel” and “fires were not hot enough to melt steel” is explained as well. One might get the impression that any “molten steel” issue raised in “conspiracy theories”, including the relevant “molten steel” phenomenon you might have heard of cursorily, was easily explainable by the official account.

Basically, the BBC and “Der Spiegel” are doing nothing more than to comment on remarks about misleading mass media statements from 2001 that steel “melted” in the pre-collapse WTC fires. At least the BBC ran these stories itself in 2001; see, for example, two figures²¹⁵ from the BBC website dating from 2001:

Address http://news.bbc.co.uk/1/hi/english/static/in_depth/americas/2001/day_of_terror/trade_center_disaster/3.stm

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BBC NEWS Front Page | One year on

AMERICA'S DAY OF TERROR TRADE CENTER DISASTER

THE FOUR HIJACKS TRADE CENTER DISASTER IN PICTURES TWIN TOWERS TENANTS TIMELINE EYEWITNESS

Fires rage in the towers

At the heart of the towers were vertical steel and concrete cores, housing lift shafts and stairwells. The towers were built to be tough enough to withstand the impact of a plane. The steel was covered in concrete to guarantee firefighters a minimum period of one or two hours in which they could operate if a fire developed.

But the fires on 11 September were fed by more than 91,000 litres of jet fuel. The steel cores within the towers heated up to above 800C and the protective concrete cladding on the cores could only keep the heat at bay for a short time. Once the steel frame on one floor had melted, it collapsed, inflicting massive forces on the already-weakened floor below.

²¹⁴ Quoted from <http://www.spiegel.de/international/spiegel/0,1518,451741-2,00.html>.

²¹⁵ From:

http://news.bbc.co.uk/1/hi/english/static/in_depth/americas/2001/day_of_terror/trade_center_disaster/3.stm (and following page [... /4.stm]).

Address http://news.bbc.co.uk/1/hi/english/static/in_depth/americas/2001/day_of_terror/trade_center_disaster/4.stm

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NEWS Front Page | One year on

AMERICA'S DAY OF TERROR **TRADE CENTER DISASTER**

▶ THE FOUR HIJACKS ▶ **TRADE CENTER DISASTER** ▶ IN PICTURES ▶ TWIN TOWERS TENANTS ▶ TIMELINE ▶ EYEWITNESS

09:59 South tower collapses

Once one floor had melted the collapse became inevitable, as each new falling floor added to the pressure on the floor below. Further down the building, even steel at normal temperatures gave way under the enormous weight - an estimated 100,000 tonnes.

A little less than an hour after the second crash, the south tower, which had been the second tower to be hit, crumbled to the ground. Hundreds of firefighters, police officers and people who were trying to escape the towers were crushed.

The caption speaks of 800 degrees Celsius only, so at least any metallurgist was able to know that the term “*hot enough to melt*” could have only meant ‘weakened’ in this case. But the text also features the vague statement “*The steel cores within the towers heated up above 800C*” that gives no upper limit. But the BBC must know that their argument in 2007 just discusses remarks about mass media statements that suggested in 2001 that the “*Jet fuel-fed fire may have melted steel in towers*”²¹⁶.

It is doubtless deliberate that the BBC and “Der Spiegel” omitted crucial subjects (including the “molten steel” at Ground Zero phenomenon and the thermite hypothesis) in their articles. There is no way that the BBC or “Der Spiegel” chose authors who lacked the ability to notice the controlled demolition hypothesis when researching what they call “conspiracy theories”²¹⁷. “Der Spiegel” features in the WTC related part lengthy discussions of questions like:

²¹⁶ Quoted from “The Baltimore Sun”, September 12, 2001. The quotation cites the headline. You have to read the article to learn that ‘melted’ is used in the sense of ‘weakened’.
<http://www.baltimoresun.com/news/custom/attack/bal-te.md.impact12sep12,1,6215809.story?coll=bal-attack-utility> If you consider, for example, statements like the following quote by J. Fetzer in the AP article: “*Tenure gives you a secure position where you can engage in controversial issues,*” Fetzer said. “*That’s what you should be doing. I’m smart enough to know ... that fire from airplanes can’t melt steel.*”. It is not stated that he would think that it would be an indispensable prerequisite for a building collapse that the steel actually melts. If you spread misleading statements in 2001 you have at least to mention this fact if you later comment on the statements of people who dispute them.

²¹⁷ The strategy used by the BBC and by “Der Spiegel” is basically the same strategy as that used by the “Popular Mechanics” magazine in 2005. It already appears as implausible that “Popular Mechanics” ‘missed’ in 2005 the relevant issues. But in 2006 it was hardly possible to ‘miss’ the controlled demolition hypothesis when researching the subject. The BBC ‘missed’ reporting relevant points of the controlled demolition hypothesis but show in their broadcast the “The Conspiracy Files” a picture of the journal where you can find this hypothesis explained:

“Who was the woman in this picture?” (about 15 lines of text about the identity of a victim who was visible in the crash hole of the North Tower)²¹⁸, or “How many people jumped?” (12 lines of text), or “How toxic was the cloud of debris?” (17 lines of text), or “Why wasn’t anyone rescued from the roof?” (20 lines of text). Certainly, the authors of the news magazine “Der Spiegel” are able to realize that the number of people who were forced to jump and that the identity of a victim, who is visible in a pre-collapse photograph are topics that do not contribute to the elucidation of the cause of the WTC collapses. “Der Spiegel” deliberately exploits the fates of victims to distract from the lack of substance in their argument.

The articles by the BBC and “Der Spiegel” are clearly written with the intention of closing down any debate. The BBC (one of the most important news media in the U.K.), and “Der Spiegel” (which has the reputation of being one of the most important news media in Germany) are publishing disinformation about 9-11²¹⁹. It is noteworthy that the BBC has even



<http://video.google.com/videoplay?docid=7211162933213078906&q=&hl=de>.

²¹⁸ <http://www.spiegel.de/international/spiegel/0.1518.451741-3.00.html>. An **excerpt**: “Most likely, hardly anything about this story is accurate, even the woman’s name; there is no evidence to substantiate her identity. Her husband, who reportedly recognized her, has discussed his wife’s death in several interviews without ever referring to the picture. None of her colleagues, including the company’s own memorial site on the Internet, has mentioned the photo. The only certainty is that the real Edna Cintron was not among the survivors. Nobody knows if she is the mystery woman in the picture.” Given that it is discussed under the headline “9-11 conspiracy theories” you might learn: *hardly anything about this* [insert ‘9-11 conspiracy theory’] *story is accurate [...]; there is no evidence to substantiate [...].*

²¹⁹ Both articles contain more evidence to support this statement. The argument above is restricted to the WTC related parts of both articles, and focuses on the line of reasoning ‘pre-collapse fires were not hot enough to melt steel’.

The article “The 9/11 conspiracy movement” (that is part of the BBC series, see http://news.bbc.co.uk/1/hi/programmes/conspiracy_files/6354679.stm) can be used as a textbook example for using favorable terms and descriptions for covering one side (in this case the U.S. government perspective), and unfavorable terms and descriptions for covering the other side (in this case those who questioning the official account).

The article “Plots, paranoia, and blame” (that is part of the BBC series, see http://news.bbc.co.uk/1/hi/programmes/conspiracy_files/6213226.stm) links “conspiracy theories” to paranoia. The author is the same Peter Knight who was quoted in the Washington Post article.

The BBC broadcast aimed to stir up emotions against “conspiracy theories” by pointing out twice that ‘9-11 conspiracy theories’ caused distress for the families of the victims (**quotes**): “But many simply don’t accept the official conclusions however distressing this may be for the relatives of those who died.” And: “The 9-11 conspiracy file is certain to remain open for a very long time to come however distressing and painful this will be for the families of those who died that day.” The first statement starts at about 4.50 min into the film, the second statement is at the end of the film.

a public service mandate that requires them to treat “*controversial subjects [...] with due accuracy and impartiality*”²²⁰.

Disinformation tries to anticipate and to match the assumed knowledge of the target audience

The quantity and quality of information that is provided by implication varies among the mass media articles discussed above. Each of the four media articles that are discussed in the first subsection informs you that scientists question the official account of 9-11, and that Steven Jones is one of them. If you read the report by the BBC you are informed that “*academics*” question 9-11, the one named is J. Fetzer²²¹. If you read the article in “Der Spiegel”, which is in the original version aimed at a German audience, you do not learn that scientists question the official account of 9-11.

Disinformation tries to anticipate and to match the knowledge of the target audience. It is not in the interest of disinformation authors to ‘give information away’, but they might have to do so in order to approach the subject. The discussed U.S.-media articles target audiences that are likely to have heard that scientists question the official account, and that Steven Jones is one of them (see in this respect the Skipp Howard/Ohio University poll, and the article in the Chronicle of Higher Education, see above). The main job of these articles is to keep people from visiting the relevant internet websites. U.K. residents were in 2007 not as likely as U.S. residents to have heard from scientists questioning the official account of 9-11, so the BBC names just Fetzer. The article in the “The Telegraph” featuring scientists and Steven Jones was certainly only published in this U.K. media because of the “Daily Mail” article about “*leading scientists*” who “*say [that] they have evidence that points to one of the biggest conspiracies ever perpetrated*” (see above); it targets an audience that does not have much background knowledge. It fits that the Telegraph article describes Jones as selling “*solar funnel cooker based on ... cold fusion*”, and it fits that the article barely covers topics raised in the “*conspiracy theories*”²²². German residents are even less likely to visit U.S. websites as

²²⁰ **Quote:** “*The public service mandate of the BBC is guaranteed by a number of provisions in both the Charter and Agreement. Article 3(a) of the Charter establishes the general public service obligation, namely to provide sound and television broadcasting programmes of information, education and entertainment as public services. The BBC is also under an obligation to ensure that it remains under constant and effective review from outside, including by public meetings and seminars [...]*”

Far more detailed public service and content obligations are spelt out in the Agreement. Clause 3 provides that the Home Services shall respect high general standards, particularly regarding their content, quality and editorial integrity, and cover a wide range of subjects. Clause 5 elaborates on these standards, providing that the BBC should do all it can to ensure that the Home Services are balanced and serve the tastes and needs of different audiences, do not improperly exploit susceptibilities, do not contain abusive treatment of religious views, do not offend against good taste or decency, or offend public feeling, and are not likely to incite to crime or lead to disorder. In addition, controversial subjects should be treated with due accuracy and impartiality and should not, outside of limited exceptions, contain material expressing the opinion of the Corporation on current affairs or matters of public policy. The BBC is required to draw up a code giving guidance as to how these requirements may be observed in its services and programming, in particular as regards impartiality.”

Quoted from: Toby Mendel : Public Service Broadcasting. A comparative Legal Survey . - Kuala Lumpur : UNESCO, Asia Pacific Institute for Broadcasting Development, 2000.

<http://www.unesco.org/webworld/publications/mendel/uk.html>; underlining added.

²²¹ See “*The 9/11 conspiracy movement*”, http://news.bbc.co.uk/1/hi/programmes/conspiracy_files/6354679.stm, “*We're all conspiracy theorists at heart*”, <http://news.bbc.co.uk/1/hi/magazine/6368341.stm>.

²²² The following **quote** contains all the information in the Telegraph article that is related to the controlled demolition hypothesis. “[Jones] *has studied debris from the disaster and concluded that explosives were used to bring down the towers. “We are investigating the possibility of termite-based arson and demolition,” he told the New York Times last week. According to Professor Jones, the burning jet fuel from the two airliners that crashed into the buildings could not have generated enough heat to cause the structures to collapse.*” Quoted from “The Telegraph”, see above. The WTC collapse is the only subject related to questioning the official account of 9-11 that is mentioned in the Telegraph article that extends over four Telegraph – web-pages.

compared to U.K. residents, so “Der Spiegel” prefers to omit any scientists and concentrates on topics like “*How many people jumped?*”.

Conspicuously, the discussion of the hypothesis that a use of thermite provides an explanation for the “molten steel at Ground Zero” sources is confined to internet-only disinformation pieces. The discussed media disinformation articles might feature thermite, and the AP article features “molten metal” and thermite, but none of those articles (and NIST’s fact sheet neither) will draw your attention directly to the line of reasoning: “molten steel” phenomenon at Ground Zero - thermite provides an explanation.

The Associated Press article and Judy Wood

One “conspiracy theorist”, Judy Wood, is covered in a more positive manner in the AP article. The author of the AP article chose statements by Wood that sound meaningful, and the author gave her space: Wood’s quotations count more than 100 words, but the five named “conspiracy theorists” Kevin Barrett, James Fetzer, David Gabbard, Steven Jones and Daniel Orr share about 69 words on quotations between them. Wood also gets more ‘personal coverage’ than any other person in the article (and more than three professors, James Fetzer, Daniel Orr, David Gabbard, together). The coverage of Wood is located towards the end of the article. This has two effects. Her name is more likely to stick in the memory of a reader, and she is covered in some ‘distance’ from the defaming statements and phrases. The coverage of Wood is suitable in that a reader gets a more positive impression from her compared to Barrett, Fetzer, Gabbard, Jones and Orr.

But with Judy Wood it is a very special kind of “conspiracy theorist” that is covered in a more positive manner. Three obvious purposes of publications that have Wood’s name as author or co-author (and that are related to 9-11) are: firstly, to attack the reputation of Steven Jones, secondly, to attack the controlled demolition hypothesis as outlined by Jones, and thirdly, to claim that the WTC was destroyed by “energy beam weapons from space”. The articles with Wood’s name on are aimed to put people off from being interested in the controlled demolition hypothesis as outlined in Jones’ article “Why indeed Did the WTC Buildings Completely Collapse?”, and they can put people off altogether from being interested in questioning the official account of 9-11. From the perspective of the author of the AP disinformation article it makes much sense to give Wood the positive coverage. An article co-authored by Wood that was published in August 2006 addresses even the same ‘science-problem’ the AP article is after²²³. A noteworthy aspect is that the author of the AP disinformation article provided Wood with the positive coverage before the relevant publications officially authored or co-authored by Wood, which target Jones and the controlled demolition hypothesis, appeared in the internet²²⁴. It is as if the author of the AP

²²³ **Quote:** “*The question now is whether participation by academic researchers will hamper or help in expanding our understanding of 9/11 and bringing the perpetrators to justice. Early returns from the most highly sought-after research on 9/11?that of physicist Steven E. Jones?predict [sic] little or no good will come from the academic establishment on either 9/11 truth or justice. Proof that government/media lied and 9/11 was an inside job is being confounded and rolled back.*” Quoted from “Why Indeed Did the WTC Buildings Disintegrate?” by Morgan Reynolds and Judy Wood.

http://nomoregames.net/index.php?page=911&subpage1=trouble_with_jones,

²²⁴ The AP article was published August 6, 2006, the first of Wood’s papers against Jones was published August 23, 2006, (see http://nomoregames.net/index.php?page=911&subpage1=trouble_with_jones). Defaming e-mails and “energy beam weapon” theories bearing Woods name appeared also at the website of the then Scholars for 9-11 Truth. It might therefore be inappropriate to interpret the link to the website of the Scholars, which was provided at the end of the AP article, as proof of balanced reporting. You can interpret it as well as an attempt to divert the internet traffic from the results of an internet search for the keywords ‘controlled demolition hypothesis Jones WTC’ to a site Wood was publishing too. Wood’s main co-author on 9-11 issues, Morgan Reynolds, is a former member of the Bush administration.

article did know in advance that Wood's future publications on the topic would have the same line of attack as the AP article.

Rewriting Science

(I) The mainstream media, science and F.R. Greening's article "Aluminum and the World Trade Center Disaster"

The above mass media articles (and other media articles) are very clear in their verdict: "9-11 conspiracy theories" (or, in other words, questioning the official account of 9-11) do not have any scientific character; but those representing the official account provide logical, valid, and science based explanations²²⁵.

The chemist F.R. Greening, PhD, referred to in the article by Associated Press as an "expert", is also promoted by AP as an authority concerning the question of what was science and what was not by quoting his statement: "*It's science with an axe to grind, and therefore it's not really science.*"²²⁶ In addition, it is presented by AP as a matter of fact that Greening was

²²⁵ There are more than the four articles discussed above in which this message is spread in mass media. To give three more examples, **quote:** "*Problem is, some of the best engineers in the country have studied these questions and come up with perfectly logical, scientific explanations for what happened.*

The National Institute of Standards and Technology did its own forty-three volume study of the Twin Towers.

"Some 200 technical experts . . . reviewed tens of thousands of documents, interviewed more than 1,000 people, reviewed 7,000 segments of video footage and 7,000 photographs, analyzed 236 pieces of steel from the wreckage, [and] performed laboratory tests and sophisticated computer simulations," the institute says.[...]

I also contacted engineering professors at MIT and other leading universities in the country, and none of them puts any stock in the 9/11 conspiracy theories. In fact, they view them as a huge waste of time. They are busy trying to figure out how to prevent buildings from falling in the future.[...]

At bottom, the 9/11 conspiracy theories are profoundly irrational and unscientific. [...]"

Quoted from "The Progressive", "Enough of the 9/11 Conspiracies, Already", by Matthew Rothschild, September 11, 2006, http://www.progressive.org/mag_wx091106i

And **quote:**

9/11:

A Date That Will Live in Infamy

review by Richard Morrock

DAVID RAY GRIFFIN'S FANCIFUL TALE of Bush administration complicity in the 9/11 terrorist attack is a perfect example of the kind of conspiratorial thinking discussed by George Case in *Skeptic* Vol. 11 No. 4. There isn't much to be learned about the fateful events from Griffin's silly book, but he gives us some useful insight into the origins of paranoia.

Quoted from <http://www.skeptic.com/eskeptic/06-01-23.html#feature> (website of the Skeptic Society).

And **quote:**

The mistaken belief that a handful of unexplained anomalies can undermine a well-established theory lies at the heart of all conspiratorial thinking (as well as creationism, Holocaust denial and the various crank theories of physics). All the "evidence" for a 9/11 conspiracy falls under the rubric of this fallacy. Such notions are easily refuted by noting that scientific theories are not built on single facts alone but on a convergence of evidence assembled from multiple lines of inquiry.

Quoted from the article: "9/11 has generated the mother of all conspiracy theories", by Michael Shermer, *Scientific American*, June 2005. <http://www.sciam.com/article.cfm?id=fahrenheit-2777>.

²²⁶ Note that Greening's statement is inconclusive. Firstly, Greening distorts something that has potential political impact with something that is *politically motivated* to make his argument 'work'. (In addition, you can

“rebutting the science used by Sept. 11 conspiracy theorists” with several papers. One of Greening’s ‘rebuttal’ papers is related to the exceptional heat at Ground Zero. However, the scientific character of this article, “*Aluminum and the World Trade Center Disaster*”²²⁷ is somewhat peculiar. (The paper was posted considerably before the AP article was published). The extraordinary character of the article and Greening’s findings, or rather suggestions, are discussed below.

Greening’s references

It is common in science to support any claims by references, experiments, calculations, or deductive reasoning. Associated Press puts forward Greening as a kind of authority on how to provide evidence in science: “*When they do cite evidence, critics such as Greening contend it’s junk science from fellow conspiracy theorists, dressed up in the language and format of real research to give it a sense of credibility.*” Of course, you should not cite ‘junk-science’ as evidence, but you should cite proper references. The article by AP does not give any hint of the evidence Greening has for his claim against those who support the controlled demolition hypothesis. But Greening’s article “*Aluminum and the World Trade Center Disaster*” contains several references. For example, Greening states that certain reactions of molten aluminium were “*proposed*” and “*discussed*” by an author S. Ashley in the “*Scientific American*”, quote²²⁸:

ask what political motivation Greening refers to, given that the people in question come from different political backgrounds.)

But Greening’s line of reasoning is inconclusive in general. See with respect to the question of what can be regarded as science the introductory textbook on the philosophy of science, “*What is this thing called Science?*” by A.F. Chalmers (third edition, 1999, Open University Press Buckingham), and the following quote from it (pages 248f): “*The production of scientific knowledge always takes place in a social context in which that aim is interrelated with other practices with different aims, such as those involving the personal or professional aims of scientists, the economic aims of funding agencies, the ideological interests of religious or political groups of various kinds and so on.*”

It is certainly useful to be aware of motivational aspects if you consider the results of some research. But you do not base your judgement about the scientific character on any political, economical, or personal motivation the initiators or authors might have. To consult motivations would not make sense in this respect. Modern scientific knowledge is rarely produced in an ivory tower, you cannot exclude the possibility of hidden motives (see the above quotation). Moreover, research that is politically motivated can be science. Example: A measurement of pollution is commissioned with an obvious political motivation (e.g. by an environmental lobby group, or by a lobby group of the automobile industry). The measurement can have political impact, it is clearly politically motivated but it can also be scientific if the study design is sound, and if the results are not distorted.

You consult criteria that are independent of non-scientific motivation to check if a work has scientific character. A basic criterion is that you do not publish merely the final result(s). You must publish the argument in a manner that allows others to scrutinize your claims: you give a line of reasoning, you cite references, or, if your results are based on experiments or measurements you will state which equipment was used, which data were acquired etc. It is NIST’s *10.000 pages report*, that does not comply with these basic requirements (NIST did not publish crucial raw data).

²²⁷ <http://www.911myths.com/WTCTHERM.pdf>, “*Original Version (01.06): Jan 2006*

This version (03.06): April 2006”

²²⁸ Quoted from “*Aluminum and the World Trade Center Disaster*”, see above.

The idea that molten aluminum-thermite reactions may have been involved in the collapse of the Twin Towers is not new. It was first proposed by S. Ashley in an October 2001 article published in *Scientific American*. Ashley noted that the aviation fuel fires in the Twin Towers burned sufficiently hot to melt and *even ignite* the airliners' aluminum airframe structures. Aluminum, could then have added to the conflagrations. Hot molten aluminum could have seeped down into the floor systems, doing significant damage. Aluminum melts into burning 'goblet puddles' that would pool around depressions, such as beam joints, service openings in the floor, stairwells and so forth. The goblets are white hot, burning at an estimated 1800 degrees Celsius. At this temperature, the water of hydration in the concrete is vaporized and consumed by the aluminum. This evolves hydrogen gas that burns. Aluminum burning in concrete produces a calcium oxide/silicate slag covered by a white aluminum oxide ash, all of which serve to insulate and contain the aluminum puddle. This keeps the metal hot and burning.

And, quote²²⁹:

Thus, in addition to

the action of molten aluminum on concrete discussed by Ashley, we have referenced studies showing that mixtures of water, gypsum and rust are also capable of violent reactions with molten aluminum.

[...]

However, the author Ashley does neither *propose* nor *discuss* any thermite reaction in the *Scientific American*. A thermite reaction is commonly defined as a reaction between aluminium (or another metal, e.g. magnesium) and a metal oxide (Greening himself explains this common definition)²³⁰. But according to the statement that is printed in the “*Scientific American*” some aluminium simply burns, and in a next step some aluminium reacts with the “*water of hydration*” of the concrete, generating hydrogen. No reduction of any metal oxide is named. Moreover, the author Ashley does not “*discuss*” any reaction at all in the “*Scientific American*”. Instead, Ashley just repeats the claim of “*one well-informed correspondent*” who is not named, quote²³¹:

Others have pointed out the possibility that the aviation fuel fires burned sufficiently hot to melt and ignite the airliners' aluminum airframe structures. Aluminum, a pyrophoric metal, could have added to the conflagrations. Hot molten aluminum, suggests one well-informed correspondent, could have seeped down into the floor systems, doing significant damage. "Aluminum melts into burning 'goblet puddles' that would pool around depressions, [such as] beam joints, service openings in the floor, stair wells and so forth...The goblets are white hot, burning at an estimated 1800 degrees Celsius. At this temperature, the water of hydration in the concrete is vaporized and consumed by the aluminum. This evolves hydrogen gas that burns. Aluminum burning in concrete produces a calcium oxide/silicate slag covered by a white aluminum oxide ash, all of which serve to insulate and contain the aluminum puddle. This keeps the metal hot and burning. If you look at pictures of Iraqi aircraft destroyed in their concrete shelters [during the Persian Gulf war], you will notice a deep imprint of the burned aircraft on the concrete floor.

This statement of the “*well-informed correspondent*”, which is repeated (but not *discussed*) in the “*Scientific American*”, does not seem to be supported by any facts. Aluminium only starts

²²⁹ Quoted from “*Aluminum and the World Trade Center Disaster*”, see above.

²³⁰ Quote (from “*Aluminum and the World Trade Center Disaster*”, see above):

H & K conclude that aluminum, striking the container, reacts with a metal oxide, M-O, and undergoes a so-called *thermite* reaction generating extreme heat. This reaction may be represented by the equation:



²³¹ <http://www.sciam.com/article.cfm?id=when-the-twin-towers-fell&page=3>

to burn at very high temperatures, and it is therefore not likely that any aeroplane aluminum burnt in the WTC Towers. See the following statement by T.W. Eagar²³², MIT, **quote**:
“Some reports suggest that the aluminum from the aircraft ignited, creating very high temperatures. While it is possible to ignite aluminum under special conditions, such conditions are not commonly attained in a hydrocarbon-based diffuse flame. In addition, the flame would be white hot, like a giant sparkler. There was no evidence of such aluminum ignition, which would have been visible even through the dense soot.”

NIST states, **quote**²³³:

Aluminum will burn, but in normal fires it usually melts instead because the metal surface is protected by an oxide layer that must be breached before ignition can take place.

An assessment of damage after an accident during which molten aluminium was in contact with concrete describes cracking and spilling of the concrete as the result, **quote**²³⁴:

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INTRODUCTION

A fire broke out at Narora Atomic Power Station-I site on the morning of March 31, 1993. The following material burnt in the Turbo Generator Foundation and Control Equipment Area : i) Hydrogen gas, ii) Transformer oil, iii) Bearing oil, and iv) Power and other cables. The structure was damaged due to i) Fire, ii) Failure of Turbine blades resulting in huge unbalance forces and iii) Melting of the Aluminium bus bar. The fire was brought under control in about two hours time.

Keeping in view the importance of the structure, a detailed in-situ damage assessment of the structure was carried out using experimental and theoretical techniques. A brief description of the investigation and the results obtained is presented in the following sections.

VISUAL INSPECTION

Figure I shows the plan of the TG foundation. The Aluminium bus bar melted at elevation 104 and the Aluminium was splashed on columns and on the soffit of the TG top Deck. In this area, the spalling of concrete was observed resulting from local heating. The cracking and spalling of the concrete occurred mostly where molten Aluminium has fallen.

Associated Press' authority for scientific evidence, Greening, builds his argument on the statement of an anonymous person, and sells it as something what was [allegedly] “discussed by Ashley” in the “Scientific American”. Apply Greening’s quality standard and you can construct “scientific evidence” for whatsoever: Find an author willing to print some claim as a

²³² Quoted from “Why Did the World Trade Center Collapse? Science, Engineering, and Speculation”, by Thomas W. Eagar and Christopher Musso, *JOM*, 53 (12) (2001), pp. 8-11, <http://www.tms.org/pubs/journals/JOM/0112/Eagar/Eagar-0112.html>.

²³³ Quoted from NISTNISTNCSTAR 1-5a chap 9 AppdxC.pdf / Page 344 (48 of 268 in PDF).

²³⁴ Quoted from “ASSESSMENT OF DAMAGE DUE TO FIRE TO TURBO GENERATOR FOUNDATION OF NARORA ATOMIC POWER STATION”, by B.K. Goyal, B.K. Tripathi, Y Sing, M.M. Tilak and K.N. Nayak, in “Concrete In The Service Of Mankind. Concrete Repair, Rehabilitation and Protection”, edited by Ravindra K. Dhir and M. Roderick Jones, 1996, Taylor & Francis, pages 45 – 52, page 46.

statement of an anonymous person in a journal that has some reputation as a popular science magazine and sell it later as “scientific evidence”.

A few more examples of Greening’s practice of citing evidence can be found below.

Greening’s explanation for the high temperatures at Ground Zero

Greening states in his paper that a hydrogen releasing reaction of aluminium in the collapse piles caused, indirectly by the burning hydrogen, the high temperatures at Ground Zero, **quote**²³⁵:

3. Aluminum Reactions in the Rubble Pile

Remarkably, our story of the deadly role played by aluminum in the WTC disaster is not quite over because aluminum has one more chemical trick to perform in the rubble pile. The WTC rubble pile was a veritable stew of materials including [. . .] mixed with pulverized concrete, gypsum, glass fiber, vermiculite, chrysotile asbestos, mineral wool and glass as well as paper, plastic, copper wire and large sections of steel and aluminum.

Two factors should be considered in evaluating this mix of materials. First, because of the way it was formed amid fires and explosions, *the rubble pile was very hot*.

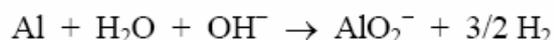
[...]

We will consider how the rubble pile could be on fire many days after 9-11 in a moment, but first we must discuss the second important factor controlling the chemistry of the rubble pile, namely *the presence of water*. The basement of the Twin Towers was severely damaged on 9-11 and flooded with water from sewer lines, fresh domestic water lines, steam pipes and condensate returns. Just days after 9-11, millions of gallons of water had already flowed into WTC basement floors and was being pumped out at a rate of about 3,000 gallons per minute. In the days and weeks following 9-11 water was continuously percolating through the rubble piles from firefighters’ hoses and rainfall.

[...]

The US Geological Survey has measured the properties of water exposed to WTC dust and debris (See pubs.usgs.gov/of/2001) These so-called “WTC leach solutions” are invariably very alkaline with pH ~ 10. Chemical analysis has shown up to 700 µg/liter of Al dissolved in the leach water. The USGS researchers concluded that: “*Of all the metals in the WTC dust, aluminum is leached in greatest amounts*”.

The dissolution of aluminum in the WTC rubble pile water is readily explained by the well-known corrosion reaction:



What is most significant about this reaction is that aluminum enters solution as the aluminate ion, AlO_2^- , *with the release of 3/2 moles of gaseous hydrogen*. That this type of reaction occurred in the WTC rubble pile should not be surprising since hydrogen production reactions have been reported in similar environments involving aluminum in contact with water and cementitious materials. Thus the Pacific Northwest National Laboratory recently published a report entitled: “*Potential for Generation of Flammable Mixtures of Hydrogen from Aluminum-Grout Interaction in the K Basin During Basin Grouting*.” (See PNNL Report No. 15156 by S.M. Short and B.M. Parker, issued April 2005.) In the introduction to this report we read:

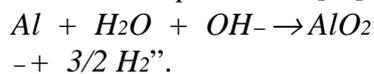
²³⁵ Quoted from “*Aluminum and the World Trade Center Disaster*”, see above.

“This evaluation was performed to assess the potential impact of imbedding equipment and debris within a layer of grout to provide shielding and to fix contamination. The presence of aluminum in the form of empty canisters, identification tags or other hardware will lead to the generation of hydrogen as high pH grout contacts and reacts with the aluminum metal.”

The authors go on to explain that hydrogen generation from grouted aluminum occurs due to the reaction of aluminum with hydroxide ion from $\text{Ca}(\text{OH})_2$ present in the pore water of the grout. Measurements at 50°C showed a maximum hydrogen gas generation rate of about $5\text{ cm}^3/\text{min}$ for an aluminum coupon with an area of about 20 cm^2 exposed to a saturated solution of calcium hydroxide.

Using this result and other quantitative data related to the rate of corrosion of aluminum in alkali media at temperatures up to 100°C , it is possible to estimate that tens of thousands of liters of hydrogen gas were released, *per day*, into the WTC rubble pile immediately after 9-11. Because of the presence of hot smoldering debris and localized fires at ground zero, this hydrogen would have burnt and contributed to the heat generation that kept the WTC rubble pile hot and cooking for months after 9-11.

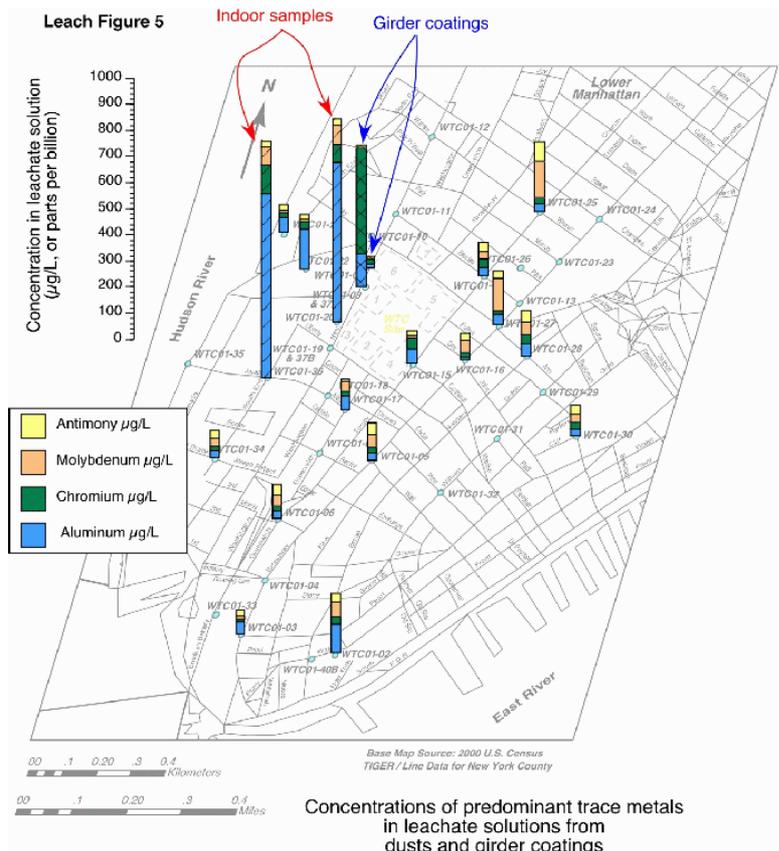
Obviously, the result of the USGS survey dust study only says something about the existence of aluminium in collected dust samples. The dust was collected in two apartments (sample WTC01-20, collected indoors from the gymnasium across West Street from the WTC, and sample WTC01-36, collected in a 30th-floor apartment in a building southwest of the WTC), and at several other places in Manhattan (see map below), and from two girders (to check the asbestos content of their coatings). You might consider that the same kind of dust leached into the WTC collapse pile water, and based on this you might assume that the collapse pile water contained great amounts of aluminium as well. However, this aluminium would have originated from the dry dust. There is no need to explain the *“dissolution of aluminum in the WTC rubble pile water [...] readily [...] by the well-known corrosion reaction:*



The collected dust was never in any contact with WTC collapse pile water, and it was not a residue from any WTC collapse pile water²³⁶. See the following **chart and quote** from the USGS dust study²³⁷:

²³⁶ You might, of course, say that this corrosion reaction happened nevertheless in the collapse piles, but you would have to give sound explanation to support this claim. Greening fails to do so.

²³⁷ “Evaluation of World Trade Center dusts and girder coatings using a simulated precipitation leaching procedure” as part of “Environmental Studies of the World Trade Center area after the September 11, 2001 attack.”, see above (part one), <http://pubs.usgs.gov/of/2001/ofr-01-0429/leach1/index.html>



“**Leach Figure 5.** Map of lower Manhattan showing variations (as stacked bar charts) in concentrations of predominant trace metals and metalloids for leachate solutions derived from the various dusts and girder coating samples. Dust samples collected indoors are indicated by the single hatch pattern and girder coating samples by the cross-hatch pattern; all others are dust samples collected outdoors. Note changes in scale of the concentration axis of the plots between this figure and leach figures 2-6.”

In addition, at least in the published study, there is no statement of the chemical states of the aluminium that was found in the leach. The USGS study states: “Of the various major and trace elements, aluminum is leached in greatest amounts from the indoor dust samples relative to outdoor dust samples. This indicates that the indoor dusts, in addition to having a greater proportion of reactive concrete, also contain some sort of reactive aluminum-bearing material.” You can only conclude from this statement that the authors did not know the chemical state(s) of the detected aluminium. The USGS authors cannot even exclude elemental metals in the leach water²³⁸. Therefore the chemical state of the aluminium might have been elemental, and/or it might have originated from any kind of leachable aluminium compounds which were, for whatever reason, part of the WTC dust. Greening’s interpretation of the aluminium as “dissolved aluminium oxide” is nothing but an arbitrary assumption.

Greening’s estimate of the amount of hydrogen released by the assumed corrosion of aluminium in the collapse pile water is based on an experiment that is described in the Pacific Northwest National Laboratory report and based on other, undisclosed, data, from undisclosed sources, about the “rate of corrosion of aluminum in alkali media”. However, if you apply the data from the named experiment, or the data from the undisclosed sources you have to justify

²³⁸ **Quote** from the USGS study: “The metal concentrations summarized in Leach Table 1 may not represent truly dissolved material, because the nitrocellulose filter (0.45 micrometer pore size) used to filter the leachate fluids prior to analysis will not filter out metals present in very small particles or colloids.”

this. Greening does not show that the collapse pile water was either a saturated calcium hydroxide solution (like that used in the experiment in the Pacific Northwest National Laboratory report), or comparable to the alkaline media of the undisclosed studies. Greening only stresses how alkaline the USGS-study leach water was. But the pH measured in the USGS study was the result of the design of the experiment, **quote**²³⁹: “Dust samples were leached at a 1:20 ratio (2.5 grams dust / 50 milliliters DI [deionized water (pH ~5.5)] water”. If any other dust / water ratio had been used in the USGS study another pH value would have resulted. In addition, the pH of about ten, as cited by Greening, is an average. In the study is stated, **quote**²⁴⁰: “the leachate solutions developed moderately alkaline to alkaline pH values (8.2 - 11.8)”. The result of the experiments in the USGS study do not reveal much about the pH value of the WTC collapse piles water due to the unknown water/dust ratio in the piles, and due to the fact that other chemicals, including acidic ones²⁴¹, might have leached into the collapse pile water.

Greening informs the reader in some detail about the “combustion” of hydrogen (**quote**²⁴²):

1. Some relevant information about the combustion of H₂:

H₂ is highly flammable over a concentration range from 4 to 75 % - the 2nd widest range of any common flammable gas. With such a wide flammability range it is easily ignited. The flame from burning H₂ has a very high heat content – its flame temperature is over 2000° C. *H₂ burns with an almost invisible flame.*

However, there exist some facts about the reaction between hydrogen and oxygen not mentioned by Greening. Hydrogen will only burn quietly if it is mixed with oxygen (or air) directly in the flame²⁴³. If hydrogen is mixed first with oxygen or with air before the ignition occurs the reaction will be noisy: the hydrogen reacts either with a kind of whizzing/hissing sound if the oxygen content is low, or with a bang, or with a very loud bang (if you have between about 18 and 59 vol. % of hydrogen in normal air). Hydrogen is lighter than any other gas and much lighter than air. Relatively low, steadily produced amounts of hydrogen will not react if they rise steadily upwards and the concentration stays below the flammability threshold. Greening’s hypothetical 10.000 liters hydrogen per day would either have not reacted at all (if the concentration remains below of the flammability threshold), or it would have reacted but this would have been audible with some likelihood. Greening fails to mention the possibility of explosions and he fails to explain how it was expected that significant amounts of hydrogen would have burnt in the collapse pile quietly and undetected.

The danger of hydrogen explosions is a well known fact²⁴⁴. The hydrogen-oxygen mixture is used as an example in chemistry textbooks to explain the chemical principles ‘activation energy’, ‘chain-branch reaction’, and ‘explosion due to a chain branch reaction’²⁴⁵. The German term for hydrogen mixed with air or oxygen is “Knallgas” ~ “bang-gas”.

²³⁹ Quoted from <http://pubs.usgs.gov/of/2001/ofr-01-0429/leach1/index.html>.

²⁴⁰ Quoted from <http://pubs.usgs.gov/of/2001/ofr-01-0429/leach1/index.html>.

²⁴¹ It is known that acid was contained in batteries (which were stored for back up power in the WTC). An article by the Los Alamos National Laboratory mentions, e.g., “385 gallons of sulfuric acid” as one of many “unusual work place hazards” (“Lab workers hear personal account of World Trade Center recovery efforts”, By Public Affairs Office, November 21, 2002, http://www.lanl.gov/news/index.php/fuseaction/nb.story/story_id/3243).

²⁴² Quoted from “Aluminum ...”, see above, “Addendum”.

²⁴³ Hydrogen that is used as fuel (for example for welding purposes) is mixed with the oxygen directly in the flame.

²⁴⁴ See material safety data sheets for hydrogen, for example, <http://eweb.processplants.boc.com/msds/gases/na/english/G4.pdf>, or <http://www.glue.umd.edu/~choi/MSDS/Airgas/HYDROGEN.pdf>.

²⁴⁵ See, e.g., Holleman, Wiberg, (see above), pages 261ff, and 361ff; Atkins, (see above), page 720.

It is strange that a chemist who holds a PhD “explains” the occurrence of aluminium in WTC dust that was collected inter alia in apartments with a corrosion reaction of aluminium in collapse pile water. It is even stranger that a chemist does not discuss the possibility of hydrogen explosions when he proposes “tens of thousands of liters of hydrogen gas” that were according to him “released, per day, into the WTC rubble pile” and would have “burnt” in the collapse piles because “of the presence of hot smoldering debris and localized fires at ground zero”²⁴⁶. Greening is capable of “dress[ing] up” his inconclusive comments “in the language and format of real research to give it a sense of credibility”; certainly an intellectually demanding task. Dr. Greening’s intellectual abilities are not in question; Greening must be aware of the oddities in his argument, he publishes the inconclusive argument deliberately in order to ‘explain’ the exceptionally high temperatures at Ground Zero consistent with the official account of 9-11.

Greening’s thermite reactions, and Eagar’s ‘red herring’ statement

What’s the hypothesis?

Greening further suggests in his article that it was in fact thermite reactions that brought down the Twin Towers, but he suggests that they were so-called natural or accidental thermite reactions. The idea behind the proposal of such “accidental thermite reactions” is obvious. “Accidental” thermite reactions would explain some of the evidence that is otherwise interpreted as telltale signs that deliberately planted thermite was used to assist in controlled demolitions of the Twin Towers as consistent with the official government account of 9-11. Greening underlines this, **quote**²⁴⁷:

It is indeed ironic that the progressive collapse of the Twin Towers has prompted many 9-11 researchers to reach the erroneous conclusion that deliberately placed thermite “cutter charges” *must* have been used to bring down these buildings. The findings outlined in this article show the underlying reasons for this misconception. Simply put, thermite-induced reactions *were* largely responsible for the destruction of the Twin Towers on that terrible September day in New York City – but the fatal damage was not from deliberately planted thermite charges. Molten aluminum was the culprit, and the true terrorist!

Reading Greening’s paper you might understand that he was claiming that accidental thermite reactions contributed to the collapse of the Twin Towers. However, it is questionable if Greening does in fact claim that accidental thermite reactions occurred on a relevant scale in the WTC (relevant scale means: somehow comparable to the effect of the proposed deliberately planted thermite). Greening states “*thermite-induced reactions were largely responsible for the destruction of the Twin Towers*”. There is a difference between “thermite reactions” and “*thermite-induced reactions*”. A “*thermite-induced reaction*” would be, for example, the explosion of an explosive gas triggered by impact “thermite-sparking”, as discussed in the Colorado thermite-sparking study (see below). The thermite reaction involved is only on a microscopic scale, and do not produce any visible amounts of molten iron. It just produce a hot spark. You can interpret Greening’s statement “*thermite-induced reactions were largely responsible for the destruction of the Twin Towers on that terrible September day*” (see above) as meaning solely that jet fuel vapor was ignited by thermite-sparking due to the aeroplane-aluminium impact on rusted steel surfaces. The collapses would

²⁴⁶ Note that hydrogen is a particularly well studied element in chemistry, and the possibility of explosions is well known.

²⁴⁷ Quoted from “*Aluminum and the World Trade Center Disaster*” by Greening, see above.

be due to aeroplane impact and resulting fires. This theory was the same as the official collapse theory with the added unimportant detail that thermite sparking contributed to the ignition of the jet fuel. Greening claims explicitly that such thermite sparking occurred in the WTC, **quote**:

This report shows that intense, thermite-induced, sparking occurs between relatively small (~ 100 gram) aluminum and rusty steel projectiles at impact velocities as low as 12 m/s. In light of these findings there can be no doubt that thermite-enhanced sparking occurred within the Twin Towers when the Boeing 767 aircraft, traveling at about 200 m/s, struck the core columns.

But Greening does nowhere state explicitly in his article that accidental thermite reactions produced significant amounts of molten iron (or of any other metal) in the WTC, and Greening does nowhere state explicitly that accidental thermite reactions severed steel columns in WTC.

Instead, he discusses thermite reactions in general, and he discusses the general possibility that accidental thermite reactions can occur in casting moulds or by impact sparking. In addition, by discussing that molten aluminium, rust and certain compounds were available in the WTC, the reader is lead to conclude that thermite reactions occurred on a relevant scale in the WTC. See the following **quotes**²⁴⁸:

It is obviously very difficult to estimate *how much* molten aluminum was produced in either of the Twin Towers during 9-11.

However, from the temperature and heat flux estimates reported by NIST, and the mass of aluminum exposed, it is probable that as much as 10,000 kg of molten aluminum formed in each Tower.

And:

Occurrence of Thermite Type Compounds at the WTC

If we look at H & K's list of compounds that have the potential to induce "catastrophic explosions" in the presence of molten aluminum, namely, water, lime, gypsum and rust, we see that all of them were present in the Twin Towers during 9-11:

Greening's comments about the so-called "Thermite Type Compounds", which follow after the last quoted statement, stretch over several lines: five lines of text regarding the headword "water", nine lines of text regarding the headword "lime" (**quote**: "*an estimated 48,000,000 kg of concrete per Tower*"), four lines of text regarding the headword "gypsum", seven lines of text regarding the headword "rust".

Greening informs the reader that thermite reactions are used to cut through heavy iron and steel. But when Greening mentions thermite reactions with respect to the WTC he prefers to use inconclusive terms (like "*molten aluminum-thermite explosions – reactions*"), and he

²⁴⁸ Quoted from "*Aluminum and the World Trade Center Disaster*", see above.

claims (**quote**²⁴⁹):

Based on these findings it is proposed that the formation of molten aluminum in the Twin Towers just before their collapse, accounts for most of the startling and controversial observations that accompanied the spectacular destruction of these massive structures. It is suggested that molten aluminum initiated the global collapse of each Tower by burning through key structural supports in the impact zones. Molten aluminum-thermite reactions could explain the rapid intensification of the fires and the many detonations seen and heard moments before and during the collapse of each Tower. Molten aluminum-thermite explosions - reactions that are quite capable of shattering ceramic or metal molds during aluminum casting - would help to explain the much-debated pulverization of the WTC concrete.

And, **quote**²⁵⁰:

- After about 40 minutes, parts of the airframe in WTC 2 approached the critical temperature range of 500 - 550° C where aluminum alloys starts to soften and melt.
- At 50 minutes, molten aluminum forms and starts to flow from the airframe in WTC 2.
- The molten aluminum re-ignites some of the smoldering fires and rapidly burns through other combustible materials that survived the initial conflagration. Molten aluminum also falls onto fractured concrete, gypsum and rusted steel surfaces inducing violent thermite explosions, dispersing globules of molten metal and igniting new fires.
- The extreme heat generated by the molten aluminum rapidly weakens already damaged steel columns and trusses in the impact zone causing local slumping and partial collapse.
- The remains of the semi-molten airframe fall to the floor below and mix with fresh combustible material, air, water, thermite reagents (crushed concrete, gypsum, rust), and sections of aluminum cladding from the Tower's façade, initiating more explosions.
- This sequence of events is now repeated in a rapidly accelerating, and increasingly violent cascade of destruction. Gravity adds momentum to the downward acceleration of the mass of debris and WTC 2 collapses in less than 16 seconds.
- The burning aluminum remaining at the end of the collapse glows brightly for a moment and illuminates the rising clouds of smoke and dust at ground zero.
- About 25 minutes later, the temperature of the aircraft wreckage in WTC 1 reaches the critical 500 - 550° C range where molten aluminum starts to flow. The sequence of events observed in WTC 2 is repeated in WTC 1 and a second global collapse ensues.

The effects of the “*molten aluminum-thermite reactions*”, “*molten aluminum-thermite explosions – reactions*” or “*violent thermite explosion*” as described by Greening will leave the heavy steel support structure of a huge steel frame building largely unaffected. The only effect was from the increased heat release rate by “*igniting new fires*” and by the *intensification* of the fires. Greening states that “*molten aluminum*” burnt through “*key structural supports*”. (He fails to explain how this could work.) Conspicuously, he does not state that molten iron as a product of accidental thermite reaction severed the structural supports.

Greening gives estimates or explanations in respect of the availability of “*thermite type compounds at the WTC*”. But he does not give an estimate of the quantitative scale of the

²⁴⁹ Quoted from “*Aluminum and the World Trade Center Disaster*”, see above.

²⁵⁰ Quoted from “*Aluminum and the World Trade Center Disaster*”, see above.

proposed accidental thermite reactions. Greening only states (**quote**²⁵¹):

It may be calculated that the energy released by the chemical conversion of the molten aluminum produced in the Twin Towers was about 10^{12} Joules or *comparable to the potential energy released by the collapse of the Towers!*

This is as close as you get to a precise statement by Greening that there were chemical reactions of molten aluminum on a significant scale in the WTC on 9-11. But in this sentence he does not say exactly what the chemical reactions are (they might be thermite reactions or something else, like the reactions “*discussed by Ashley*”, see above). Moreover, the statement contains a loophole with the phrase “*it may be calculated*”. “*It may be calculated*” only expresses an option for a possible calculation. Greening does not explain the calculation, and he does not state that options to “*calculate*” quite differently could be ruled out (so *it may as well be calculated*, for example, *that the energy released by the chemical conversion of the molten aluminum was negligible*).

By Greening’s article the reader is led to conclude that thermite reactions occurred on a relevant scale in the WTC. But Greening does not state that accidental thermite reactions produced significant amounts of molten iron (or of any other metal) in the WTC, or that accidental thermite reactions resulted in severed steel supports in the WTC²⁵². Greening basically uses a similar tactic as NIST in their fact sheet: meaningful arguments are suggested by the use of certain terms (and in Greening’s case also by general explanations and by stressing that the reactants were available) but the actual argument is restricted, and the true meaning is hidden.

Greening’s suggestion of thermite reactions based on molten aeroplane aluminium and rust and Eagar’s ‘red herring’ statement

The probability of accidental thermite reactions based on molten aeroplane aluminium and rust in the WTC has already been tested in experiments. The result was that no accidental thermite reactions were observed²⁵³. But the results of these experiments are dismissed by

²⁵¹ Quoted from “*Aluminum and the World Trade Center Disaster*”, see above.

²⁵² That Greening does not propose molten iron (or any other metal that was product of thermite reactions) is consistent with the fact that he explains the high temperatures in the collapse piles not with accidental pre-collapse thermite reactions but with a corrosion reaction of aluminium (see above).

²⁵³ See

http://journalof911studies.com/volume/200609/Why_Indeed_Did_the_WTC_Buildings_Completely_Collapse_Jones_Thermite_World_Trade_Center.pdf, by Steven Jones, page 13, **quote**:

“*Other explanations for the observations are sought, of course. For example, F. Greening has suggested that aluminum from the planes which struck the Towers could melt, and that this aluminum might fall on “rusted steel surfaces inducing violent thermite explosions.” [Greening, 2006] So a few students and I did straightforward experiments by melting aluminum and dropping molten aluminum on pre-heated rusted steel surfaces. There were in fact no “violent thermite” reactions seen. We observed that the temperature of the molten aluminum in contact with the rusty iron simply cooled at about 25°C per minute (measured with an infrared probe) until the aluminum solidified, so that any thermite reactions between the aluminum and iron oxide must have been minimal and did not compete with radiative and conductive cooling, thus NOT supporting predictions made by Greening. There was no observable damage or even warping of the steel. (See photograph below.) Nor were violent reactions observed when we dropped molten aluminum onto crushed gypsum and concrete (wet or dry) and rusty steel. [Jones, 2006; available at <http://www.scholarsfor911truth.org/ExptAlMelt.doc>] These experiments lend no support whatever to the notion [see Greening, 2006] that molten aluminum in the WTC Towers could have destroyed the enormous steel columns in the cores of the buildings, even if those columns were rusty and somehow subjected to direct contact with liquid aluminum.” See for the experiments the above link to Jones, 2006.*

others. The following quote²⁵⁴ from the “*The Chronicle of Higher Education*” summarizes the disputed case from the point of view of someone who regards any questioning of the official account of 9-11 as a waste of time:

So Mr. Eagar has become reluctantly familiar with Mr. Jones's hypothesis, and he is not impressed. For example, he says, the cascade of yellow-hot particles coming out of the south tower could be any number of things: a butane can igniting, sparks from an electrical arc, molten aluminum and water forming a hydrogen reaction — or, perhaps most likely, a spontaneous, completely accidental thermite reaction.

Occasionally, he says, given enough mingled surface area, molten aluminum and rust can react violently, à la thermite. Given that there probably was plenty of molten aluminum from the plane wreckage in that building, Mr. Eagar says, it is entirely possible that this is what happened.

Others have brought up this notion as well, so Mr. Jones has carried out experiments in his lab trying to get small quantities of molten aluminum to react with rust. He has not witnessed the reaction and so rules it out. But Mr. Eagar says this is just a red herring: Accidental thermite reactions are a well-known phenomenon, he says. It just takes a lot of exposed surface area for the reaction to start.

Still, Mr. Eagar does not care to respond formally to Mr. Jones or the conspiracy movement. "I don't see any point in engaging them," he says.

Hence, in the world of mainstream science, Mr. Jones's hypothesis is more or less dead on the vine. But in the world of 9/11 Truth, it has seeded a whole garden of theories.

It is noteworthy that Eagar is beyond doubt an expert. He is specializing in a relevant subject, and his curriculum vitae lists several additional qualification that should enable him to judge the subject based on facts²⁵⁵. As a member of the public who does not have any knowledge

²⁵⁴ Quoted from “*Professors of Paranoia? Academics give a scholarly stamp to 9/11 conspiracy theories*”, by John Gravois, in “*The Chronicle of Higher Education*”, June 2006, see above, <http://chronicle.com/free/v52/i42/42a01001.htm>.

²⁵⁵ Eagar, who studied metallurgy and materials science, has been employed at the MIT since 1976 (except for some time when he worked for the US Office of Naval Research) first as assistant professor, then as professor of materials engineering at the MIT. Thermite reactions are used in metallurgy for the extraction of metals, for the production of alloys, and in welding (both in thermite-welding and as an enhancing component in arc welding as well). One of Eagar's special interests is welding. He is, for example, a “Fellow and Honorary Member” of the “American Welding Society”, he is member of the “Technical Advisory Board Navy Joining Center”, and of the Editorial Board of “*Science and Technology of Welding and Joining*”. In addition, Eagar lists in his CV teaching experience for undergraduates in “Physical Chemistry” and in “Chemical Metallurgy” (the influence of the [relative] surface area that Eagar cites in his “red herring” statement relates to physical chemistry, and thermite reactions should be read in chemical metallurgy). Eagar lists also teaching experience on graduate and “professional” level courses in “Welding and Joining Processes”. (See http://eagar.mit.edu/EagarPapers/TWE_CV.htm) See the following quotes about welding/thermite:

Because
of the relatively low cost of the equipment and materials used, thermite welding is still the most widely used field-welding process for rails [11, 12].

about thermite reaction you are confronted with two contradictory statements, namely the results of experiments by a physicist, and the claim of an expert. There probably does not exist any standard chemistry text book that could help to find out what is right by discussing the subject ‘threshold values for natural/accidental thermite reactions’ in general; or even for the special case of ‘accidental thermite reactions between rust and molten aeroplane-aluminium after impact of an airliner crashing into a steel frame building’.

Greening states in his article, **quote**²⁵⁶:

“Our present study of the propensity of molten aluminum to react violently with common structural materials not only supports, but extends the above scenario [from the “well-informed correspondent” mentioned by the “Scientific American”]. Thus, in addition to the action of molten aluminum on concrete discussed by Ashley, we have referenced studies showing that mixtures of water, gypsum and rust are also capable of violent reactions with molten aluminum.” The terminology “present study” suggests that Greening would have authored a scientific paper that was based on his own experiments, including experiments addressing reactions of molten aluminium with rust. But Greening does not describe any experiments undertaken by him on this topic. At least he cites two references from the scientific literature. In one reference reactions are described on a scale that produced sparks, in the other reference the occurrence of thermite reactions was suggested by the authors when one mould after another exploded accompanied by a flash of light when molten aluminium was poured into them.²⁵⁷ What is not described in these references (as cited by Greening) is that these reactions would be on a scale that produced visible amounts of molten iron. However, without significant amounts of molten iron you will not impair steel columns. The references are not suitable to consider the possibility that rust-aluminium thermite reactions contributed to the collapse of the WTC buildings; sparks and flashes of light cannot bring a steel frame building to collapse (and the jet-fuel would also have been ignited without thermite-sparking).

In an arc welding process using a consumable electrode, thermite mixtures are often bound to the electrode to add additional heat to the arc and provide additional filler metal [19, 20, 117, 118].

Quoted from “Thermite reactions: their utilization in the synthesis and processing of materials”, by L. L. Wang, Z. A. Munir and Y. M. Maximov, in [Journal of Materials Science, Volume 28, Number 14 / Januar 1993](#) (review article).

²⁵⁶ Quoted from “Aluminum and the World Trade Center Disaster”, see above.

²⁵⁷ **Quote** from Greening’s article:

The nature and causes of molten aluminum-water explosions has been studied in some detail by P.D. Hess and K.J. Brondyke, who published their results in the April 1969 issue of the trade journal *Metal Progress*. [..]

A true “chemical” explosion involving exothermic reactions between molten aluminum, water and the lining of the pit or mold. Hess and Brondyke (H & K) describe these reactions as “catastrophic” since they invariably blow the container apart and are accompanied by a bright flash of light. H & K’s investigations revealed that these violent explosions occurred when coatings of lime, gypsum, rust, or a sludge of aluminum hydroxide were present. [..]

[..]

H & K conclude that aluminum, striking the container, reacts with a metal oxide, M-O, and undergoes a so-called *thermite* reaction generating extreme heat.

Note, that Greening does not cite any evidence that H&K had observed any visible end products of a thermite reaction, such as molten iron.

T.W. Eagar refers in his “red herring” statement explicitly to the relative surface area, and the relative surface area does in fact have a great influence on chemical reactions (see above, Rewriting chemistry). However, if you consider the commercial thermite mixture it is obvious that even this powdery mixture, which has a high surface to volume ratio (both aluminium and iron oxide are in form of a powder), needs additional energy before the thermite reaction starts. Any reactions, including highly exothermic reactions, have to overcome an energy barrier called ‘activation energy’ to start²⁵⁸.

In commercial use of thermite the ‘activation energy’ is normally provided by burning a magnesium ribbon that has been stuck in the iron oxide /aluminium powder mixture. The burning magnesium starts the reaction in the thermite mixture by heating the materials in the vicinity. Accidental thermite reactions cannot get their activation energy from burning magnesium ribbons. However, if you have a fire you do have an energy source to heat the aluminium and/or the rust, and this might be sufficient to start the reaction. The question is if the fire in the WTC would have allowed rust and/or aluminium to heat sufficiently so that accidental thermite reactions on a scale that produces visible amounts of molten iron were possible. For this you would need to know at what temperature the energy barrier between rust and molten aluminium is overcome in order to start the reaction. At the Colorado School of Mines experiments were performed that determine energy barriers of thermite reactions. See the following **quote**²⁵⁹ from the study that was performed at the Center for Welding, Joining, and Coating Research, Department of Metallurgical and Materials Engineering, Colorado School of Mines:

5.3.2. Energy State Necessary for Aluminum to React

A method to determine the thermally activated state for ignition of the aluminum exothermic reaction can be developed by measuring thermite temperature as seen from the differential thermal analysis (Figures 2,3 and 4) and then reporting the enthalpy of aluminum at this temperature. This thermal state means that statistically there are sufficient aluminum atoms to have sufficient energy to surmount the activation energy barrier for the reaction to proceed.

As part of this Colorado study the temperature thresholds were determined for typical rust (so-called “*wet rust*”), dehydrated rust,²⁶⁰ and iron oxide (the form that is typically used in the commercial thermite mixture) to start to react with aluminium if both reactants are heated together²⁶¹.

²⁵⁸ E.g. it needs some effort to light coal, a burning match is not sufficient to provide the necessary energy to start the reaction. First, you have to ignite some paper, you add smaller pieces of wood, after this you add larger pieces of wood and only then you might have success with starting the exothermic reaction of burning coal. The principle ‘activation energy’ is very basic in chemistry and explained in standard chemistry textbooks.

²⁵⁹ “FEASIBILITY OF THERMITE SPARKING WITH IMPACT OF RUSTED STEEL ONTO ALUMINUM COATED STEEL”, by Iman Maroef, Yeong-Do Park, and David L. Olson, December 31, 2002, Center for Welding, Joining And Coating Research, Colorado School of Mines, MMS Project # 1435-01-01-PO-18216; MT-CWJCR-002-024, http://www.mms.gov/tarprojects/405/Final%20Report-2002_1.pdf.

²⁶⁰ I was unable to understand what the term “dry rust”, as used by the authors, means. Given some explanation by the authors regarding rust in general, and regarding dehydrated rust (page 7 / page 8 of 66 in PDF) the “dry rust” might be iron oxide, but the authors refer to the “dry rust” also with the term “iron-hydroxide”. However, given the results of the temperature measurements it does not seem necessary to discuss this question here.

²⁶¹ See the following **quote** from the Colorado study:

Differential thermal analysis (DTA) was performed on three samples:

- 1) aluminum and hematite powder mix (thermite),
- 2) aluminum and moist Fe(OH)₃ mix,
- 3) aluminum and air-dried Fe(OH)₃ mix.

All DTA runs were made in air with a heating rate of 20°C/min, heating the sample from room temperature to 1400°C.

The results of the Colorado experiment showed that normal “wet-rust” (the kind of rust you have normally in a building if you have rust) and aluminium (which was in powder form at the start of the experiment) in intimate contact reacted at about 1000 degrees Celsius. The authors state that this reaction will release significantly less energy than the standard thermite reaction²⁶². The “dry rust” reacted with the aluminium at 900 degrees Celsius. The iron oxide (haematite) / aluminium mixture reacted at 1100 degrees Celsius. The temperatures necessary for the reaction to start were rated by the authors as “*very high*”, **quote**:

Differential thermal analysis was performed to evaluate the sequence of chemical reactions associated with the ramp heating of a mixture of air-dried rust-aluminum powder, moist rust-aluminum powder, and iron oxide-aluminum powder. The results indicate that in all cases the rust or oxide is in intimate contact with molten aluminum to at least 240°C above the melting temperature of the aluminum before the exothermic reaction occurs. The degree of intimate contact in molten aluminum must be at least equivalent to aluminum smears on rusted steel. These results suggest that very high temperatures must be reached before the thermite-type reaction would occur.

It is stated in the study that molten aluminium must be at a temperature of at least 240 degrees Celsius/Kelvin above the melting point of aluminium before the reaction starts. Given that this is based on a melting point of approximately 660 degrees Celsius, and given that the aluminium alloys used in the aeroplane frames have lower melting points, the difference between reaction temperature and melting point would have been even greater in the WTC²⁶³.

DTA in this case means that you heat a sample (A) simultaneously with a control sample (that will not react or melt etc. during heating) in a special kind of furnace. By measuring the temperatures in both samples you can conclude at what temperatures something takes place in the sample (A) that consumes or releases thermal energy.

²⁶² See the following **quotes** from the Colorado study:

From these calculations and by comparing rust-aluminum reactions to iron oxide-aluminum reactions, the amount of heat produced per mole of oxygen from the oxide or rust was found to be less than half for the rust reaction when compared to the typical thermite reaction. It appears that the hydrous iron oxide (rust) changed the energetics so that the exothermic contribution was significantly reduced.

And:

Differential thermal analyses of aluminum powder in mixtures of various oxygen sources (wet rust, dry rust and iron oxides) were performed. The reaction of the aluminum-oxide mixtures verified the literature reported results that thermite reactions require a temperature of approximately 1100°C to ignite. This high temperature is achieved in thermite welding by the burning of a magnesium foil strip, which is embedded into the thermite mixture. The results for aluminum-dry rust showed the reaction required a lower temperature to ignite; approximately 970°C is needed. The aluminum- wet rust mixture spent its energy on the endothermic release of water vapor.

²⁶³ See the following **quote** from the NIST report for the melting points of the alloys:

Much of the structure of the Boeing 767 is formed from two aluminum alloys that have been identified as 2024 and 7075 (NIST NCSTAR 1-3). The melting points for these alloys vary as the material melts. The Aluminum Association handbook (The Aluminum Association 2003) lists the melting point ranges for the alloys as roughly 500 °C to 638 °C and 475 °C to 635 °C for alloys 2024 and 7075, respectively. ’

Quoted from NISTNCSTAR 1-5A, page 375 (79 of 268 in PDF).

You can conclude from the above that the likelihood is close to zero that there were any accidental thermite reactions between molten aluminium and rust on any significant scale in the WTC on 9-11. When aeroplane aluminium melts it will drop or flow down. It might contact rust but no reaction will occur because the necessary activation energy is not provided at the temperatures (475° - 638° Celsius) the aeroplane aluminium melts. It is not just some degrees that are missing on the threshold temperature but a difference of between 262° and 425° Celsius/Kelvin (depending on the aluminium alloy) for the reaction with 'dry rust', and a difference of between 362° and 525° Celsius/Kelvin (depending on the alloy) for the reaction with the typical 'wet rust' (in both cases the rust would probably have to be hot enough too). It is not conceivable that significant amounts of molten aluminium were heated to the threshold temperatures in the WTC²⁶⁴.

The study design of the Colorado-study "molten aluminium reacts with rust" fits remarkably well with one of the subjects discussed in Greening's article, namely: "molten aluminium reacts with rust". Interestingly, the Colorado-study and the thermite-sparking study that is referred to by Greening are in fact the same study²⁶⁵. Greening only mentions the thermite-sparks, not the determined threshold temperatures for molten aluminium / rust thermite reactions. From the perspective of a disinformation author, it is, of course, very sound not to mention those parts of the study where thermite reactions of molten aluminium with rust are analyzed, given that the result does not fit the disinformation purpose. This is "science" and "scientific evidence" as promoted by Associated Press: You cite a study as evidence but you do not mention those parts of the study that contradict your claim.

It is unlikely that Eagar would interpret the results of the Colorado study as a "red herring". The study design excludes the possibility that the surface to volume ratio was too low²⁶⁶. In addition, you can assume that Eagar knows the Department of Metallurgical and Materials Engineering from the Colorado School of Mines as a serious scientific institution (he published many of his more recent papers together with an assistant professor of this department). In addition, you can assume that Eagar knows that one of the co-authors of the

²⁶⁴ One possible scenario was that molten aluminium dropped or flowed down and was heated by a nearby fire. But it is highly unlikely that the temperature of the aluminium would significantly increase if it is heated by a nearby fire in the given time frame. Another possible scenario was that aluminium flowed down into a fire. But if significant amounts of aluminium flowed into a fire it would most likely deprive the fire of its oxygen supply. A very hypothetical scenario was that molten aluminium flew into a kind of container, was heated over a fire, reached the necessary temperature in the given time frame, and then flowed out of the container onto rust. It is highly unlikely that this happened. You needed a suitably located container that holds the aluminium during heating and releases the aluminium after the necessary temperature was reached (it is unlikely that there was/were such container[s] in the WTC), and you needed a fuel supply at the given location that allowed a fire to burn hot and long enough.

Note that even Greening expects that the aluminium only melted after 50 minutes. Note, that it needed an extraordinary fuel load to have a fire burning at one location over 50 minutes (See NIST's statement about unusual burning behavior. See below, Appendix Pressure Pulses). It is very unlikely that random fires burnt even longer at any given location in the WTC. In addition, the significant amounts of heated aluminium needed to contact significant amounts of 'wet' or 'dry' rust to produce any significant amounts of molten iron capable of severing steel columns.

²⁶⁵ See the following **quote** from Greening's article:

The Colorado School of Mines recently published a report. (No. MT-CWJCR-002-024), entitled "*Feasibility of Thermite Sparking with Impact of Rusted Steel onto Aluminum Coated Steel.*" This report shows that intense, thermite-induced, sparking occurs!

[...]

²⁶⁶ They started with cold mixtures of aluminium powder with rust or iron oxide that were heated. This makes better conditions in terms of surface area as you can expect when already molten aluminium (with a given surface tension) contact rust by random.

study, D. L. Olson, is a much honored scientists (one of Olson's main fields of interests is, likewise to Eagar's, welding²⁶⁷).

In addition, the activation energy (expressed in terms of the necessary temperature) that was measured in the Colorado study for the typical thermite mixture is consistent with the literature. See the following **quote** from the Colorado study:

The literature search found that aluminum and iron oxide mixtures will react to produce a thermite reaction, but only after the temperature of approximately 1100°C is reached (23).

Moreover, there is another reason why Eagar will never challenge the results of the Colorado study: Eagar does not need any study to be aware that his statement is dishonest. He is in fact an expert. See all the above mentioned qualifications, memberships and teaching experience (see footnote). Eagar must know the basics about thermite reactions. He must know that almost all thermite reactions have very high activation energies. He must know that the commercially used powdery thermite mixture (which has already a high surface to volume ratio) will only react if the necessary high activation energy is provided, usually with a burning magnesium ribbon. You cannot miss these points if you have teaching experience in "Physical Chemistry", "Chemical Metallurgy", and in "Welding and Joining Processes". Remarkably, Eagar conceals in his statement the crucial fact that the reaction needs very high temperatures to start even if the surface to volume ratio is large.

The feasibility of of accidental thermite reactions based on molten aeroplane aluminium and crushed gypsum and concrete in the WTC

In addition to the occurrence of rust-molten aluminium thermite reaction Greening also suggests that thermite reactions between molten aluminium and crushed concrete or gypsum occurred in the WTC, **quote**²⁶⁸ (see also some of the other quotes above):

H & K's investigations revealed that these violent explosions occurred when coatings of lime, gypsum, rust, or a sludge of aluminum hydroxide where present. [...]

H & K conclude that aluminum, striking the container, reacts with a metal oxide, M-O, and undergoes a so-called *thermite* reaction generating extreme heat. [...]

Molten aluminum also falls onto fractured concrete, gypsum and rusted steel surfaces inducing violent thermite explosions, dispersing globules of molten metal and igniting new fires.

Our present study of the propensity of molten aluminum to react violently with common structural materials not only supports, but extends the above scenario. Thus, in addition to the action of molten aluminum on concrete discussed by Ashley, we have referenced studies showing that mixtures of water, gypsum and rust are also capable of violent reactions with molten aluminum.

In the case of the aluminium-rust thermite reaction it was clear which chemical reaction was suggested. However, if you want to propose thermite reactions that was based on molten aluminium and gypsum or concrete you would have to provide some more details or reaction equations to have at least something that can be regarded as a hypothesis. You need a metal oxide for a thermite reaction, but neither gypsum nor concrete contain any free metal oxides. Greening does not give any details or reaction equations. Instead he solves the problem of

²⁶⁷ See <http://www.mines.edu/academic/met/pe/faculty/olson.html>.

²⁶⁸ Quoted from "Aluminum and the World Trade Center Disaster", see above.

needing a metal oxide for a thermite reaction in regard to the concrete with the following statement, **quote**²⁶⁹:

Lime:

Lime is calcium oxide and forms the base for all cements and concretes where it typically constitutes 60 – 67 wt %. (WTC 1 & 2 contained an estimated 48,000,000 kg of concrete per Tower.) The principal binding agent in concrete is calcium silicate hydrate. The water of hydration of this compound, constituting 5 – 7 % of the weight of concrete, is present in the form of H₂O bridges between Ca-O and Si-O layers. This water accounts for much of the chemical bonding that forms between lime and silica during the manufacture of concrete. As previously noted, the combination of water and metal oxide bonding in concrete makes this material very susceptible to explosive reactions in the presence of molten aluminum.

This statement might suggest that there was plenty of calcium oxide available in the WTC (some 30.000 tons in each tower). However, this statement is at least as nonsensical as if you suggested the existence of grams (or pounds) of elemental sodium and gaseous chlorine in many kitchens based on the fact that you can find salt (which is sodium chloride and “constitutes” of sodium and chlorine), electricity and water in these kitchens.

Concrete contains many compounds but not any free calcium oxide²⁷⁰. Greening does not even state which of the compounds in the concrete would react. Wallboard gypsum is calcium sulfate bound with the water of crystallization but it is not calcium oxide either. If you heat gypsum up to 1200° Celsius it will result in dehydrated gypsum (calcium sulfate with less or no water of crystallization) but not in calcium oxide. According to the chemistry textbook gypsum only starts to decompose into calcium oxide and sulfur dioxide at temperatures of 1200° degrees Celsius (which were not available in the WTC)²⁷¹. Similarly, if you try to dehydrate one or more of the many different compounds which make up common concrete by heating (due to fire or contact with molten aluminium) you will have (if at all) dehydrated compounds, but not any metal oxides²⁷².

²⁶⁹ Quoted from “*Aluminum and the World Trade Center Disaster*”, see above.

²⁷⁰ Cement is normally produced by heating ground limestone (calcium carbonate), clay, sand, iron ore, and sometimes bauxite together at 1450 degrees Celsius. The products Tricalcium silicate, Dicalcium silicate, Tricalcium aluminate, Calciumaluminat ferrite are called “klinker”. Ground “klinker” is basic cement. For special kinds of cement this basic cement powder is mixed with different substances (e.g. with so-called fly-ash, ground blast-furnace slag, calcium sulfate, or ground limestone). Some of these added substances contain some amount of calcium oxide (there can be up to 15 percent of calcium-oxide in the cement powder). The cement powder will be mixed with water, and aggregates (sand, stones etc.) on the construction site. The compounds that make up the cement will react with the water and with carbon dioxide (from air) to form concrete. The hardened concrete contains many compounds but no calcium oxide. The former calcium oxide is mostly bound in complex silicates, aluminates, and ferrites, and maybe in other complex compounds as well. There cannot have been any significant amounts of residual calcium oxide left in the concrete of the WTC. Residual calcium oxide reacts with the carbon dioxide and the water in the air to create calcium carbonate (lime stone) over the course of time. See, e.g., <http://www.zeckomat.com/daten/BSL2-Pruefungsfragen.pdf> (university website, Technische Universität Graz, or http://www.beuth.de/sixcms_upload/media/2332/9124496.pdf (a copy of a German DIN Standard page for cement).

Lime stone (which can be found in nature, and in any standard hardened mortar, and which is calcium carbonate) can be referred to in short as “lime” as well. Greening seems to take advantage of this to suggest that there was calcium oxide in the WTC.

²⁷¹ Holleman, Wiberg, see above, page 918.

There exists a technique to decompose gypsum into calcium oxide and other compounds at temperatures between 900 and 1100 degrees Celsius, but this technique uses coke and a special kind of furnace. Greening would have to show that this technique would have worked in the conditions in the WTC (with burning jet-fuel/office contents as coke-substitute, without a special furnace, in random conditions and in a limited range of time).

²⁷². Calcium aluminate, calcium silicate, and calcium ferrite have melting points between 1500 and 1600 degrees Celsius. These compounds will not decompose to calcium oxide (and other substances) even at these temperatures.

If someone wanted to establish a scientific hypothesis about accidental thermite reactions based on molten aeroplane aluminium and gypsum and/or concrete in the WTC he or she would have to explain how the gypsum and one or more compounds in the concrete will react or decompose to form the oxides that are necessary reactants for a thermite reaction. Greening fails to do so. In addition, he or she would have to show that the calcium oxide (which might have originated from the gypsum or concrete), or the silicon oxide (which might have originated from concrete), or any other metal oxide that may have been available after decomposing concrete, can undergo thermite reactions under the conditions given in the WTC. He or she would have to show this either by citing some suitable references or by performing some experiments that he or she would have to describe exactly enough so that others can try to reproduce them. In both cases it would be advantageous to have exact reaction equations stated - it is chemistry after all. That Greening fails to give any proper evidence, or any proper hypotheses, or any exact reaction equations is not surprising if you consider that commercially the reaction between calcium oxide and aluminium is performed only in a vacuum at 1200° Celsius²⁷³. The reaction between aluminium and silicon oxide starts at about 1580° Celsius²⁷⁴. But Greening claims that he had “*referenced studies*”. The so-called “*referenced studies*” cited by Greening are:

²⁷³ See the following quote from a publication by EPA:

B. Generalized Process Description

1. Discussion of Typical Production Processes

Calcium metal is produced by the aluminothermic method involving the high temperature vacuum reduction of calcium oxide. The raw materials for this process are limestone and aluminum. In this process, aluminum metal acts as the reducing agent. Exhibits 1 and 2 present flow diagrams for the typical process for producing calcium metal.

2. Generalized Process Flow Diagram

Aluminothermic Process

As shown in Exhibit 1, high calcium limestone, CaCO₃, is quarried and calcined to form calcium oxide. As shown in Exhibit 2, the calcium oxide is then ground to a small particle size and dry blended with the desired amount of finely divided aluminum. This mixture is then compacted into briquettes to ensure good contacts for reactants. The briquettes are then placed in horizontal tubes, i.e., retorts, made of heat resistant steel and heated to 1100-1200°C. The open ends of the retort protrude from the furnace and are cooled by water jackets to condense the calcium vapor. The retorts are then sealed and evacuated to a pressure less than 13 Pa. After the reaction has been allowed to proceed for approximately 24 hours, the vacuum is broken with argon and the condensed blocks of about 99% pure calcium metal, known as crowns, and calcium aluminate residue are removed.⁴

Quoted from <http://www.epa.gov/epaoswer/other/mining/minedock/id/id4-cal.pdf>. According to Wikipedia.(<http://de.wikipedia.org/wiki/Calcium>) the vacuum is necessary that you can produce the metal calcium because it is more likely that calcium reduces aluminium than that aluminium reduces the calcium. This explanation is indirectly supported by the following statement by EPA:

Calcium is an excellent reducing agent, and at elevated temperatures it reacts with oxides or halides of almost all metallic elements to form the corresponding metal. Calcium is used in lead refining (for removal of bismuth), steel refining (as a desulfurizer and deoxidizer), and as an alloying agent for aluminum, silicon, and lead. Calcium is also used in the recovery of refractory metals (e.g., chromium, rare earth metals, and thorium) from their oxides and in the reduction of uranium dioxide.³

²⁷⁴ See the following **quote**:

“Referenced study” (1): A posting on an astronomy website. Someone posted the correct mix-ratio for a cement mixture for making a mould, adding that he cannot recommend this kind of moulds due to the possibility of a steam explosion, and someone else added (quote/excerpt)²⁷⁵:

“Pouring molten aluminum in a concrete mold can be *VERY DANGEROUS*.
If the concrete is of normal mix the mold has a very high chance of exploding violently showering you with molten aluminum. [...]

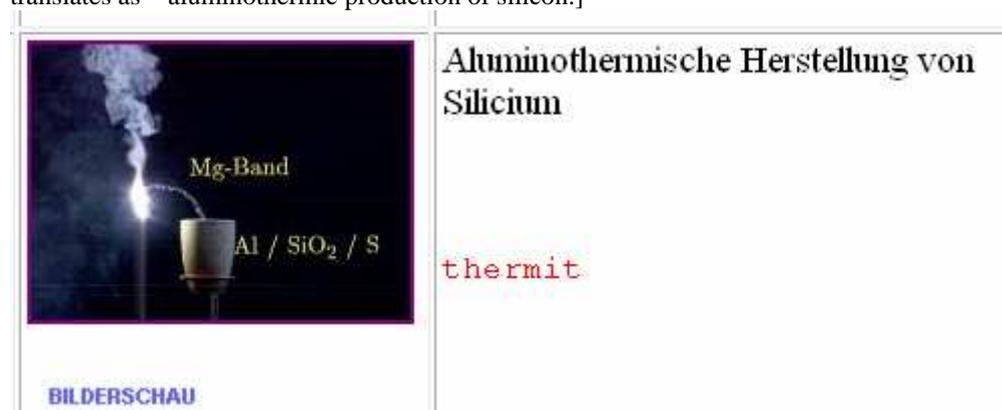
Further down the violence of the reaction is suggested, but there is no hint at thermite reactions in this so-called “referenced study”.

“Referenced study” (2) is the above cited reference by “H&K” with the exploding mould. Note that Greening does not claim that the material of the mould would have undergone any thermite reactions on a visible scale.

“Referenced study” (3) is the “discussed by Ashley” reference, a statement by an anonymous person about [alleged] reactions of molten aluminium with concrete with no thermite reactions mentioned.

Lisachenko *et al.* [56] investigated the effect of initial composition and the ignition method on the phase composition of the combustion product obtained by reacting the SiO_2 -Al mixture either with or without the addition of carbon in a nitrogen atmosphere. The three ignition methods studied were by: (1) a thermite reaction (Fe_2O_3 -Al or Fe_2O_3 -Mg), (2) plasma, and (3) heating to self-combustion (i.e. heated to 1853 K).

Quoted from “Thermite reactions: their utilization in the synthesis and processing of materials”, (see above). According to some patents it already works at about 1200° Celsius if elemental sulphur is present. See this **photograph** from a university web-site where the silicon oxide – aluminium reaction is started in presence of sulfur with a burning magnesium ribbon (as in the commercial iron-oxide thermite mixture). [The caption translates as ~ aluminothermic production of silicon.]



From <http://www.inorg.chem.ethz.ch/group/v/node5.html#1380>.

²⁷⁵ Here quoted from “Aluminum ...” (see above), the original is from <http://astro.umssystem.edu/atm/ARCHIVES/OCT00/msg00255.html>. Greening also quotes: “For those that are interested, it is more than just a steam explosion that can result. The aluminum-water reaction that occurs with molten aluminum is highly exothermic, and will cause the aluminum to detonate with greater energy release than an equivalent weight of TNT. [...]”. The author of this statement does not give any reference for his extraordinary claim; but note that it is not posted in a scientific paper but on a chat-site. The problem arises when something like this is used as ‘evidence’ in chemistry. The standard for references in chemistry are textbooks, and scientific publications based on exact calculations and experiments.

Greening's suggestions in the article "Aluminum and the World Trade Center Disaster" do not comply with the minimal requirements commonly expected from a scientific paper. No exact hypothesis, not one proper piece of evidence, no exact reaction equations that would support his suggestions can be found in Greening's article.

After Steven Jones performed experiments in response to Greening's paper, with the result that nothing reacted (see above), Greening complained about Jones' study design, **quote**²⁷⁶:

Prof. Jones has *not*
conducted anything close to the tests I suggested. Ironically, Prof. Jones quotes from an e-mail I wrote to him on January 26th 2006, where I outline the type of test that would settle the question of the role of molten aluminum in the WTC collapse:

"I suspect our different views will never be resolved by discussion alone. I therefore suggest an experimental resolution: The NIST fire tests, which were designed to simulate the conditions in WTC 1 & 2 after the aircraft impacts, should be repeated in a more realistic environment that includes shredded aluminum alloy 2024, crushed concrete and gypsum, water, rusted steel, aviation fuel, plastics, etc.... Then I want to see two things happen: (i) The fires melt the aluminum, and (ii) The molten aluminum ignites violent, explosive reactions."

The spelling out of a wish "Then I want to see two things happen: [...]" is certainly not science. Moreover, it was the job of Greening to undertake any necessary experiments himself (or to commission them) to support his suggestions²⁷⁷. The proposed reactions are not

²⁷⁶ Quoted from "Aluminum ...", see above, "Addendum".

²⁷⁷ The "wish" might be a 'select your words carefully and trick your audience' phrase. See the following **quote** from an article from the Journal JOM (1998):

For surface contact-initiated explosions, Long found, on an empirical basis, that certain surfaces, such as rusted steel, gypsum, and lime, promoted violent explosions.

However, this quote from JOM does not mean that there would be any chemical reactions of aluminium, or even thermite reactions involved. It has been well known for about 50 years that the named surfaces promote steam explosions, see the same quote as above but with the sentences in front of it, **quote**:

Metal-water explosions (also called steam explosions) in aluminum and other metal-casting pits have caused numerous injuries and fatalities (and associated damage/destruction of infrastructure) during the past 50 years. About 45 years ago, G. Long¹ of the Aluminum Company of America (now Alcoa) conducted much of the pioneering empirical experimental studies of aluminum-water steam explosions. In these experiments, various quantities of molten aluminum were poured over coated and

common knowledge, no chemistry book or “aluminium safety sheet”²⁷⁸ consulted suggests that molten aluminium that contacts gypsum or concrete would undergo thermite reactions. It is not surprising that the study design that Greening demanded was not met. The “*experimental resolution*” as “*outlined*” by Greening would be extremely expensive, and might even need cooperation from NIST.

You fail to make any proper hypothesis, you fail to give any evidence, you fail to make any experiments by yourself, you demand a study design that makes sure it will not be met, and you post something “*dressed up in the language and format of real research to give it a sense of credibility*” on the internet. Greening’s paper is anything but science.

The Colorado thermite-sparking study

From the point of view of someone who wants to explain some of the signs that point towards the use of thermite in the WTC consistent with the official account, it would be convenient if it would be possible to blame these signs on accidental thermite reactions between rust and aeroplane aluminium. The above mentioned Colorado thermite-sparking study contains some unusual details in this regard. The task of the study was the examination of the occurrence of “thermite-sparking” in a “marine environment”. (The subject of “thermite sparking” is of concern in some environments, like coal mines, because any spark might trigger an explosion, and the subject has already been investigated in several studies²⁷⁹.) The study design of the thermite sparking study included experiments regarding the outcome of high velocity impacts between aluminium and rust. Remarkably, the authors of the study are well aware that the high velocity impacts do not mirror “*any real impact incident most likely to be encountered*” in a marine environment, **quote**²⁸⁰:

uncoated submerged surfaces; the suppression or occurrence of explosions was empirically inferred. Much of what Long found is still relevant and forms the current basis for prevention of steam explosions in casting pits. For surface contact-initiated explosions, Long found, on an empirical basis, that certain surfaces, such as rusted steel, gypsum, and lime, promoted violent explosions.

It is certainly not wrong to expect that these surfaces, rust, lime (as calcium carbonate), and gypsum will promote steam explosions even if the surface is not submerged but wet. Given that the word “ignite” can be used in a figurative sense Greening might plan to ‘reveal’ one day, that he only ‘wished’ to see steam explosions. Like NIST Greening tries to avoid making ‘hard claims’ that can eventually be proven wrong. A ‘wish’ for steam explosions was well supported by scientific evidence.

The quotes above are from “Preventing melt-water explosions”, by R. P. Taleyarkhan, in [JOM Journal of the Minerals, Metals and Materials Society, Volume 50, Number 2 / Februar 1998](#), pages 35-38.

²⁷⁸ See for example:

http://www.aerospace.eaton.com/pdfs/power/msds/663_1xxxSeriesAlloysWroughtAlProd.pdf.

²⁷⁹ See, e.g., the Colorado study/ “*Background*”.

²⁸⁰ Quoted from the Colorado thermite-sparking study, see above.

Even though this preliminary result has shown the potential for sparking upon the collision between rusted steel and Al-coated steel, the range of velocity used in this initial study was much higher than one would expect to see in any real impact incident most likely to be encountered with falling objects onto tanker and floating structures. One real example would be a hammer falling from the highest point down to the inner bottom of the tanker or floating structure. The velocity involved in these cases will be in the order of 10 to 20 m/s, for a dense and solid object falling down a distance between 5 to 20 meters. In contrast, this preliminary impact testing apparatus shot the projectiles at velocities higher than 400 m/s. The main activity of this experimental study should then be based on a test matrix involving a more practical range of impact velocities, as well as projectile masses.

In addition, the authors are also aware that their measurements of the temperatures when rust and iron oxide react with molten aluminium are not necessarily useful when researching the thermite sparking problem, quote²⁸¹:

Thermodynamic evaluation undertaken in this project may not entirely represent the actual impact incident between rust and Al-coated steel. The differential thermal analysis was done at a slow heating rate for accurate measurement of the ignition temperature and identification of the exothermic reaction. Such a slow heating condition, however, only corresponded to a near equilibrium reaction between rust and aluminum. On the other hand, impact incident between rust and aluminum, such as hammer falling down to the body of the tanker, is most likely to be extremely dynamic. To get a more convincing conclusion on the potential of sparking between rust and Al-coated steel, either by spallation or by thermite reaction, an experimental program was undertaken to create various impact incidences between the two materials of interest.

So why did the authors perform these “*accurate measurements*” that determine the temperatures when rust or iron oxide reacts with aluminium, and why did they perform the high impact velocity experiments? They even designed and constructed the test apparatus for these high velocities impact tests where the minimum impact velocity was between twenty and forty times as fast as in a realistic impact scenario at an offshore workplace. However, those parts of the study design that do not fit well with the offshore thermite-sparking problem are proving conspicuously useful with respect to the feasibility of accidental rust-thermite reactions in the WTC on 9-11. Without this Colorado thermite-sparking study no research would exist that would address the possibility of accidental aluminium –rust thermite reactions due to high velocity impact (as when aeroplane aluminium impacts on rusty steel), and due to the possibility that molten aeroplane aluminium contact with rust. But based on the study design of the thermite-sparking study, which ‘on the record’ wants to elucidate what happens if a “*hammer falls down to the inner bottom of the tanker*”, it is possible to discuss basic questions someone might have in regard to the WTC and accidental thermite reactions. See also the following quote²⁸²:

The results indicate that in all cases the rust or oxide is in intimate contact with molten aluminum to at least 240°C above the melting temperature of the aluminum before the exothermic reaction occurs. The degree of intimate contact in molten aluminum must be at least equivalent to aluminum smears on rusted steel. These results suggest that very high temperatures must be reached before the thermite-type reaction would occur.

It is natural that there is “intimate contact” if there is an “impact”, so why stress that it was necessary to have at least the equivalent of smearing? In addition, the qualified statement “*very high temperatures must be reached*” is odd with respect to the background of the impact

²⁸¹ Quoted from the Colorado thermite-sparking study, see above.

²⁸² Quoted from the Colorado thermite-sparking study, see above.

sparking problem: the statement “*very high*” is relative. The authors do not discuss typical temperatures reached in impacts. However, the puzzling phrases are informative and make sense if you consider them with the WTC in mind. It would not be worth discussing the study design if the study had been submitted at another time. But the “Final Report” of this study was submitted on December 31, 2002, to the U.S. Department of Interior, Minerals Management Service. This is a few months after NIST started the WTC investigation. Another indication that the study design might have been set up with the WTC in mind is the known long term personal contact between T.W. Siewert and D.L. Olson. Siewert was involved in the NIST WTC investigation with emphasis on the WTC steel. Siewert co-authored several articles and an ‘ASM Handbook: Welding and Joining’ together with D.L. Olson²⁸³, who is one of the authors of the Colorado thermite sparking study. Given Olsen’s position at the Colorado School of Mines he was most likely the senior author of this study. Siewert is also an adjunct faculty member of the Colorado school of Mines²⁸⁴. The Colorado thermite-sparking study is at its face value unrelated to the WTC. However, one could assume that NIST intended to assess, covertly, the possibility that the collapse of the Twin Towers could be blamed on accidental thermite reactions in the WTC.

(II) The distortion of what is science, a lack of valid “debunking” arguments, and odd experts

The discipline of the philosophy of science does not offer a single “valid” definition of what is science. However, there exists a well established understanding in Western societies about

²⁸³ D. L. Olson, R. L. Hellner, L. E. Myers, R. J. Dybas, L. E. Shoemaker, and T. A. Siewert, "Arc Welding of Cast Iron", ASM Handbook on Welding, V. 6, 9th Edition, pp. 307-319, Materials Park, OH (1983);
 O. Grong, T. A. Siewert, G. P. Martins and D. L. Olson, "A Model for the Silicon Manganese Deoxidation of Steel Weld Metals", Met. Trans. 17A (10), 1797-1807 (1986);
 C.N. McCowan, D.L. Olson and T.A. Siewert, "New Expressions for Prediction of FN, Based on Weld Metal Composition", WRC Progress Report, New York, NY, November (1986)
 D. L. Olson and T. A. Siewert, "The International Research Supplement", Welding Journal 65 (10), 8 (1986);
 T. A. Siewert, C. N. McCowan, and D. L. Olson, "Ferrite Number Prediction to 100 FN in Stainless Steel Weld Metal", Welding Journal 67 (12), 289s-298s (1988);
 C. N. McCowan, T. A. Siewert and D. L. Olson, "Stainless Steel Weld Metal: Prediction of Ferrite Content", Welding Research Council Bulletin, #342 (April 1989);
 D. L. Olson and T. A. Siewert, "Present Consumable Technology Advances into the 21st Century", Welding Journal, 69 (11), 37-40 (1990);
 T. A. Siewert, C. N. McCowan, and D. L. Olson, "Ferrite Number Prediction for Stainless Steel Welds", Ferrous Alloy Weldments, Key Eng. Mats. Vol. 67-70, pp. 149-166, Trans. Tech. Publ., Zurich, Switzerland (1992).
 . D. L. Olson, T. A. Siewert, S. Liu, and G. R. Edwards (Coordinating Editors), ASM Handbook: Welding and Joining, 10th edition, vol. 6, pp. 1-1299, ISBN: 077170-382-3, ASM, Materials Park, OH (1993).
 T. A. Siewert, C. N. McCowan, R. A. Bushey, J. Doherty, T. Christ, D. J. Kotecki, D. L. Olson, L. W. Myers, Jr., E. Hinshaw and S. Kiser, "Weld Repair of the U. S. Capitol Dome, Report to the Architect of the U.S. Capitol, November (2002);
 Charles Smith, Tom Siewert, Brajendra Mishra, David Olson and Angelique Lasseigne, "Coatings for Corrosion protection: Offshore Oil and Gas Operation Facilities, Marine Pipeline and Ship Structure", NIST Special Publication 1035, Proceedings of Workshop, Biloxi, Mississippi, April 14-16, 2004, NIST, Boulder, Co, (2005);
 J.E. Jackson, D.L. Olson, A.N. Lasseigne-Jackson, B. Mishra, and T.A. Siewert, "Correlating the Influence of Magnetic Field on Solute Content in Metals Using the Thermodynamic Auxiliary Work Functions", Properties and Processes for a Hydrogen-based Economy, Sixteenth Symposium on Thermophysical Properties, July 30 - August 4, 2006, Boulder, Colorado, U.S.A.
 A. L. Lasseigne-Jackson, J. M Anton and T. A. Siewert, D. L. Olson, B. Mishra and J. E. Jackson, "Advanced Nondestructive Measurement Schemes to Actively Monitor Hydrogen Content in Steel Pipeline", Proc. QNDE 2007, Golden Colorado (2007)
 J.E. Jackson, D.L. Olson, A.N. Lasseigne-Jackson, B. Mishra, and T.A. Siewert, "Using the Thermodynamic Auxiliary Work Functions to Correlate the Magnetic Field Influence on Solute Content in Metals", to be published in the International Journal of Thermophysics (2007)
 Quoted from <http://www.mines.edu/Academic/met/pe/faculty/olson.html>.
²⁸⁴ See <http://www.mines.edu/research/cwjcr/>.

what kind of methods, theories and claims deserve to be called ‘science’. Measured against this general accepted understanding, Greening’s article “*Aluminum and the World Trade Center Disaster*” certainly lacks any scientific approach (see above). The website 911myths.com, where Greening’s article is published features not only one but several papers by Greening. This website, which offers a collection of articles by different authors, is explicitly promoted at the website of the Skeptic Society: readers “*seeking responsible analysis of the claims of the 9/11 Truth Movement*” can use (inter alia) the website 911myths.com, which was a “*great general source*”, **quote**²⁸⁵:

In addition to the specific sources cited above, readers seeking responsible analysis of the claims of the 9/11 Truth Movement can use the following general sources:

www.snopes.com
The Urban Legends Reference Pages, containing entries about conspiracy claims such as the put options, the alleged early arrival of FEMA and the Pentagon attack. The forum also contains some intelligent discussion of conspiracy theories.

www.loosechangeguide.com
This is a viewer’s guide to the documentary “Loose Change,” which contains many of the conspiracy claims discussed in this article.

www.911myths.com
A great general source for all manner of conspiracy claims.

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At least two of the articles that Greening published on 911myths.com are not even consistent with each other. The collapse events are discussed by Greening also in the article “*ENERGY TRANSFER IN THE WTC COLLAPSE*”²⁸⁶. However, in this article the collapse events are discussed by Greening without mentioning anything about reactions of aluminium. See some **excerpts**²⁸⁷ from this article:

Why Did the Towers Fall?

We have shown in this report that because of the failure of just one floor, a sequential collapse of all remaining floors was inevitable.

[...]

²⁸⁵ Quoted from “9/11 Conspiracy Theories: The 9/11 Truth Movement in Perspective”, by Phil Molé, in eSkeptic, September 11th, 2006, <http://www.skeptic.com/eskeptic/06-09-11.html#feature>. An article with the same title and by the same author was published in the print magazine “Skeptic”, Volume 12, number 4. However, the internet issue that is available on the website of the “eSkeptic” (“reading room”/“pseudohistory”/“conspiracies”) is used here.

²⁸⁶ <http://www.911myths.com/WTCREPORT.pdf>

²⁸⁷ Quoted from “ENERGY TRANSFER ...”, see above.

What caused the initial floor collapse?

Although some researchers apparently find it difficult to accept, I believe the answer to this question is essentially quite simple:

The initial floor collapse occurred due to the aircraft impact damage and the resulting eccentric loading of the core columns. [...]

7.0 CONCLUSIONS

- An analysis of the energetics of the WTC collapse events has shown that the kinetic energy of the aircraft collisions and the subsequent gravitational energy released by the descending blocks of floors were quite sufficient to destroy the twin towers in the manner observed. The use of explosive devices in either of the two towers is not necessary to explain the collapse events and is considered to be *highly unlikely*. [...]
- From a consideration of the strength of the WTC columns, and the effective area of support they provided, it is demonstrated that the conditions necessary for the initial floor collapse were initiated by the aircraft impacts and made irrevocable by the subsequent eccentric loading of the core columns. The fires that were initiated by the jet fuel spilled within the towers certainly weakened steel in localized areas in the impact zones. However, it is suggested that the total collapse of both towers would have occurred *even without the jet fuel fires*.

According to the article “*ENERGY TRANSFER IN THE WTC COLLAPSE*” it was not only “*suggested that the total collapse of both towers would have occurred even without the jet fuel fires*”, but the steel was heated just by heat generated in pre-collapse fires, **quote**:

The smoky appearance of the fires suggests that the flames inside each tower were fuel-rich and therefore probably below 900° C. In addition, the structural steel was heated indirectly and entire columns probably never attained temperatures much above 750° C. Nevertheless, ~ 20 % loss of strength is to be expected for steel heated to 550° C, a temperature that may have been reached by *some* WTC core columns.

It is not unusual that you change your opinion about a subject over time. But Greening published a first version of the “*ENERGY TRANSFER ...*” article in 2005 (collapse inevitable due to eccentric loading of the core columns, fires not important), then he published the first version of the “*Aluminum ...*” article in January 2006 (molten aluminium initiated the global collapse of each tower by burning through “*key structural supports*”), then he published a revised version of the “*ENERGY TRANSFER ...*” article in February 2006 (collapse inevitable due to eccentric loading of the core columns, fires not important), and after this a revised version of the “*Aluminum ...*” article in April 2006 (molten aluminium initiated the global collapse of each tower by burning through “*key structural supports*”)²⁸⁸. The same author writes two papers about the same subject “WTC collapse” and publishes alternately versions of the two articles. Both articles are posted on 911myths.com. According to one article molten aluminium initiated the global collapse of each tower by burning through “*key structural supports*”, and “*thermite-induced reactions were largely responsible for the destruction of the Twin Towers [...] Molten aluminum was the culprit [...]*”, according to the other article the

²⁸⁸ **Quote** from the “*ENERGY TRANSFER ...*” article: “*Original version, (1.05): March 1, 2005 This version, (2.06): February 16, 2006*”.

Quote from the “*Molten Aluminum ...*” article: “*Original Version (01.06): Jan 2006 This version (03.06): April 2006*”

Twin Towers collapsed due to mechanical factors, the collapses are explained as inevitable due to excess loads without mentioning any aluminium. You really do not need to go through the website 911myths.com with a fine-tooth comb to understand that this website is anything but a “great general source” for readers “seeking responsible analysis”. It is also easy to realize that Greening’s approach is not a scientific one.

To use Greening as an authority to give judgment on what is science, as was done by the Associated Press/education writer, represents a severe distortion of the common understanding of what is science. The author of the AP article has knowledge of Greening’s papers, **quote**²⁸⁹: “FR Greening, a Canadian chemist who has written several papers rebutting the science used by Sept. 11 conspiracy theorists.” The AP article was published in August 2006, a good time later than Greening’s articles. Likewise, it is a severe distortion of the common understanding of what is science if a website of a society that claims to promote science²⁹⁰, and the “Executive Director” of which, Dr. Michael Shermer, has a monthly column in the “Scientific American” promotes the website 911myths.com that features Greening’s ‘molten aluminium’ article, which lacks proper hypotheses and proper references, for readers “seeking responsible analysis”. See a **quote**²⁹¹ of the Skeptic Society’s website for the context:

²⁸⁹ Quoted from the AP article, see above.

²⁹⁰ The concern of the website skeptical.com was previously described at the website of the founder of the Skeptic Society, Dr. Michael Shermer, as follows, **quote**:



Dr. Michael Shermer is the founding Publisher of *Skeptic* magazine and Skeptic.com, a scientific and educational outreach for scholars, scientists, historians, and professors dedicated to exploring the facts surrounding controversial ideas and extraordinary claims.

SUBSCRIBE to *Skeptic* magazine

VISIT Skeptic.com

DONATE to the organization

Quoted from <http://www.michaelshermer.com/>.

²⁹¹ Quoted from http://www.skeptic.com/about_us/discover_skepticism.html

All our science, measured against reality, is primitive and childlike — and yet it is the most precious thing we have.

—Albert Einstein

THE SKEPTICS SOCIETY is a scientific and educational organization of scholars, scientists, historians, magicians, professors and teachers, and anyone curious about controversial ideas, extraordinary claims, revolutionary ideas, and the promotion of science. Our mission is to serve as an educational tool for those seeking clarification and viewpoints on those controversial ideas and claims.

Under the direction of Dr. Michael Shermer, the Society engages in scientific investigation and journalistic research to investigate claims made by scientists, historians, and controversial figures on a wide range of subjects. The Society also engages in discussions with leading experts in our areas of exploration. It is our hope that our efforts go a long way in promoting critical thinking and lifelong inquisitiveness in all individuals.

That the Associated Press/education writer, and the website of the Skeptic Society distort the established understanding of what is science to prove their case is revealing: in both cases the distortion of the common understanding of what is science jeopardizes the reputations of the authors and of the organizations behind them. It is also in contradiction to stated goals of the Skeptic Society, and to stated values of AP (**quote**²⁹²: *“That means we abhor inaccuracies, carelessness, bias or distortions.”*), and **quote**²⁹³: *“AP’s mission is to be the essential global news network, providing distinctive news services of the highest quality, reliability and objectivity with reports that are accurate, balanced and informed.”*). That both organizations abandon stated goals or values, and that both jeopardize their reputations suggests that the message that the Associated Press/educational writer article and the Skeptic Society article want to deliver – namely that any questioning of the official account of 9-11 was superfluous and unscientific – cannot be delivered without a distortion of the established general accepted understanding of what is science.

It can be useful in science if you have two (or more) hypotheses that compete with each other, and where each side tries to falsify the opposing hypotheses. However, Ferran and Greening do not deliver arguments in respect of the phenomenon of exceptionally high temperatures at Ground Zero that they themselves would regard as conclusive arguments (see above). Neither do they honestly take part in a contest of competing hypotheses. Instead, they rely on deliberately misleading, and/or deliberately wrong arguments or suggestions. That they resort to disinformation suggests that they were unable to put forward any sound arguments to prove their case. This, in turn, supports the hypothesis that they are trying to “debunk”.

Greening’s and Ferran’s articles are posted on websites that claim to be independent. It does not necessarily have much impact if some nonsense or disinformation is published on private websites. However, the impact of the misleading and wrong arguments distributed by officially independent private “debunking” websites gets a completely different quality due to the fact that the articles, and/or their authors, and/or the websites where the articles are posted are promoted by institutions like the Skeptic Society, by Associated Press, and by well known

²⁹² Quoted from the “**THE ASSOCIATED PRESS STATEMENT OF NEWS VALUES AND PRINCIPLES**”, 02/16/2006, <http://www.ap.org/newsvalues/index.html>.

²⁹³ <http://www.ap.org/pages/about/about.html>

media (like CNN, ABC, CBS and FOX News, all of which published the AP article). The reputation and authority these institutions and mass media may enjoy is transferred to the private websites and to their authors. The same effect applies with respect to the Blanchard/Protec/implosionworld.com article (see discussion below) that is published on a company website but that is explicitly referred to in an article by the U.S. State Department²⁹⁴ and that is promoted by the Skeptic Society. The described effect is furthermore boosted by the fact that the general message of the “debunking” articles is consistent with the general message that is spread by NIST, the U.S. State Department²⁹⁵ and mass media. All try to convince the audience that the official government account of 9-11 would provide conclusive explanations.

The “debunkers” in turn support NIST indirectly by delivering “explanations” for the undisclosed “*certain circumstances*” NIST resorts to. NIST is a well staffed institution and cannot reasonably pretend to be unaware of the influence that the surface to volume ratio of solids has on the rate of chemical reactions, but M. Ferran can. The different providers of disinformation do not only refer and link to each other (in which NIST itself does not link or refer to debunkers but it is linked by “debunkers” and media), they also complement each other nicely. Established mass media and U.S. government institutions provide reputation and authority, private “debunkers” deliver “arguments”, and NIST’s authority gives the whole thing the semblance that all was sound science.

It proves difficult to find mass media articles that report that NIST only published “Probable Collapse Sequences”,²⁹⁶ but not a chain of evidence for the theory that the Twin Towers collapsed due to impact damage and subsequent fires. It also proves difficult to find any critical remarks with respect to the NIST report in the established media. Instead, the NIST report is presented as a kind of ‘proof’ that the controlled demolition hypothesis cannot be correct²⁹⁷. It would not be appropriate to expect that every journalist must be able to deliver a critical review of the NIST WTC investigation report. However, it is appropriate to expect that a journalist, who writes about the subject, considers the critical reviews of the NIST investigation report. For example, the criticism that NIST did not publish crucial raw data, is easy to comprehend. It is also easy for a journalist to verify that NIST did not publish these data. By not publishing these data NIST’s publication does not meet the generally accepted scientific standard. This is also easily to understand.

²⁹⁴ (<http://www.america.gov/st/pubs-english/2006/August/20060828133846esnamfuaK0.2676355.html>).

²⁹⁵ See articles by the U.S. State Department that are linked from this page:

<http://usinfo.state.gov/media/misinformation.html>.

²⁹⁶ See the following **excerpt** from NISTNCSTAR 1-6:

Chapter 9	
Probable Collapse Sequences.....	285
9.1 Introduction.....	285
9.2 Methodology.....	285
9.2.1 Key Observed Events and Conditions.....	286
9.2.2 Collapse Hypotheses.....	286
9.2.3 Mathematical Modeling.....	288



²⁹⁷ See, for example, the quotation of “The Progressive”, “*Enough of the 9/11 Conspiracies, Already*”, By Matthew Rothschild, September 11, 2006, (see above in footnote) http://www.progressive.org/mag_wx091106i.

The number of scientists and engineers who are named in media in support of the official WTC collapse theory seems to be limited. Conspicuously, media articles resort in their argumentation also to unnamed scientists and engineers that would support the official collapse theory²⁹⁸. Relatively often you can find statements by Prof. T.W. Eagar, MIT. Eagar is a material scientist, and with his qualifications he certainly has the experience to comment on thermite reactions. (That Eagar prefers to conceal the relevant fact in his comment is a different story.) But Eagar is used by mass media as an ‘expert’ to comment on aspects of the collapses that would need expertise in structural engineering. See, e.g., for example, the following statement by Eagar (**quote** from the Washington Post article, see above): “*Thomas Eagar, a professor of materials science at MIT, has studied the collapse of the twin towers. "At first, I thought it was amazing that the buildings would come down in their own footprints," Eagar says. "Then I realized that it wasn't that amazing -- it's the only way a building that weighs a million tons and is 95 percent air can come down."*” If Eagar was right, why not sell ‘Do-it-yourself’ kits to perform controlled demolitions on high rise steel frame buildings in densely developed areas? Why does it need experienced controlled demolition companies to do the job? See in respect of Eagar’s expertise the following **quote**²⁹⁹ from an article in the New York Times about the assessment of the structural damage to the buildings near Ground Zero:

“There is no evidence that any buildings have been compromised structurally in a way that would require demolition.

In part, the survey suggests, that is because the twin towers collapsed almost straight downward, a circumstance that the engineers said might have reduced the death toll from the terrorist attack.

"It's like controlled demolition," said Matthys Levy, a founding partner at Weidlinger Associates, a structural engineering firm in New York. Mr. Levy, the co-author of "Why Buildings Fall Down" (Norton, 1992), said the collapse of the towers was "an uncontrolled demolition project, but it acted like a controlled demolition project."

If the buildings had tipped or tumbled sideways instead, Mr. Levy said, "you would have seen tremendous damage outside the zone, and you would have had those buildings possibly collapse."

Since 2001 Eagar has stated his obviously incorrect claim in public but remains the ‘expert’ popular with mass media in place of structural engineers. Eagar launched his career as an expert in structural engineering and building collapses simply by publishing his article “Why Did the World Trade Center Collapse? Science, Engineering, and Speculation” in the Journal of the Minerals, Metals, and Materials Society (December 2001, see above). The JOM article by the material scientist Eagar, who probably never published anything before that was related to structural engineering, became even an “*influential paper*” with respect to the

²⁹⁸ See, for example, the following **quote** from the AP article (see above):

“The standards and technology institute, and many mainstream scientists, won't debate conspiracy theorists, saying they don't want to lend them unwarranted credibility.”, and the quotation of “the Progressive” (see above). Note, that the Scientific American relied in 2001 on the statement of an unnamed “*well informed correspondent*” to suggest, inter alia, that aluminium-fires might have burned at temperatures of 1800° Celsius in the Twin Towers (see above). If the claim was right the suggested reactions may have contributed crucially to a random collapse of the buildings. But the Scientific American did not bother to produce any named scientist or engineer with respect to the suggested reactions despite their potential importance. Unnamed correspondents with unknown backgrounds are not the kind of ‘expert’ you would expect in the Scientific American.

²⁹⁹ Quoted from “A NATION CHALLENGED: THE SKYSCRAPERS; Engineers Say Buildings Near Trade Center Held Up Well”, by Eric Lipton and James Glanz, September 20, 2001, <http://query.nytimes.com/gst/fullpage.html?res=9A02E5DA103BF933A1575AC0A9679C8B63&scp=6&sq=matthys+levy&st=nyt>.

collapse of the WTC buildings, according to an introduction by NOVA to an interview Eagar gave them³⁰⁰.

³⁰⁰ See http://www.pbs.org/wgbh/nova/teachers/overviews/2907_wtc.html. The link from this site to the site with the interview does not work anymore. This must be appreciated because the site was aimed to be used in schools. A documentation of this site with comments by '911research' can be found at http://911research.wtc7.net/disinfo/experts/articles/eagar_nova/nova_eagar1.html.

Doubt that the phenomena of “molten steel”, exceptionally high temperatures and persistent heat existed at Ground Zero

In addition to the various ‘explanations’ that are offered on “debunking” websites to explain the high temperatures phenomenon at Ground Zero there exists a completely different strategy to deal with it directly, namely to doubt the validity of the “molten steel” sources, and to claim that there had not been any high temperatures phenomenon at Ground Zero that needed to be explained. One example of this strategy is the article “A *CRITICAL ANALYSIS OF THE COLLAPSE OF WTC TOWERS 1, 2 & 7 FROM AN EXPLOSIVES AND CONVENTIONAL DEMOLITION INDUSTRY VIEWPOINT*” by B. Blanchard/Protec³⁰¹, which is promoted by the U.S. Department of State's Bureau of International Information Programs³⁰² and linked

³⁰¹ <http://www.implosionworld.com/Article-WTC%20STUDY%208-06%20w%20clarif%20as%20of%209-8-06%20.pdf>; author: Brent Blanchard, Contributions and research assistance were provided by Protec employees Earl Gardner, Gary McGeever, Michael Golden and John Golden. Date: August 8, 2006. If not otherwise stated all quotations in this chapter are from this Blanchard/Protec article.

³⁰² See for this the following quote/excerpt from a US government website:

“**You Are In:** [USINFO](#) > [Current Issues](#)

19 September 2006

The Top September 11 Conspiracy Theories

Numerous unfounded conspiracy theories about the September 11 attacks continue to circulate, especially on the Internet. Some of the most prevalent myths are:

1) *The World Trade Center (WTC) twin towers were destroyed by controlled demolitions.*

This is how the collapses may have appeared to non-experts, but demolition experts point out many differences: [...] For more information, see ImplosionWorld's [article](#) on the WTC collapses and Popular Mechanics, [parts 4 and 5](#). [...]

5) *World Trade Center building 7 was destroyed by a controlled demolition. [...] For more information, see [ImplosionWorld](#) article and Popular Mechanics, [part 5](#). [...]*

(Distributed by the Bureau of International Information Programs, U.S. Department of State. Web site: <http://usinfo.state.gov>)”

Quoted from: <http://usinfo.state.gov/xarchives/display.html?p=pubs-english&y=2006&m=August&x=20060828133846esnamfuaK0.2676355> . The “*ImplosionWorld's article*” is the article by B. Blanchard/Protec.

A screen shoot from a newer version:



[...]

from the government website. The Blanchard/Protec article was also the basis of the article “What Demolition Experts Say About 9/11”, which was published in the “Skeptic”, the journal of the Skeptic Society³⁰³.

In the following it is discussed how the strategy is put into effect in the article by B. Blanchard/Protec at implosionworld.com. In addition some discussion of arguments by 911myths.com, in which the validity of the “molten steel” sources is doubted³⁰⁴, can be found in the footnotes.

Quote (from the article “A *CRITICAL ANALYSIS* ...” by Blanchard/Protec)³⁰⁵:

PURPOSE

The purpose of this analysis is to explore the possibility of explosives or similar supplemental catalysts causing or contributing to the collapse of World Trade Center Towers 1, 2 and 7 in New York on September 11, 2001 through examination of known facts as they relate to scientific principles of gravity, explosives, and structural failure. To our knowledge, this is the first analysis conducted by experts in the field of explosive demolition, as well as the first with observations and commentary from personnel directly responsible for the removal of debris from Ground Zero.

[...]

... this is a reasoned, factual analysis of a single group of questions and allegations that fall within our specific area of expertise.

[...]

ASSERTION #5

“An explosive other than conventional dynamite or RDX was used...a non-detonating compound such as thermite (aka thermate), which gets very hot upon initiation and can basically ‘melt’ steel. This can be proven by photographs of molten steel taken at Ground Zero, the temperature and duration of underground fires, and comments made by rescue workers.”

PROTEC COMMENT: We have come across no evidence to support this claim.

This claim is actually a loose connection of unrelated individual assertions, therefore we must address them as such.

For more information, see *ImplosionWorld's* article on the WTC collapses and *Popular Mechanics*, parts 4 and 5.

The Blanchard/Protec article is also linked from the site <http://www.america.gov/st/pubs-english/2007/March/20070330134723abretnuh0.9919245.html>. (The link “[Demolition professionals](#)” in the following sentence (**quote**): “[Demolition professionals](#) say controlled demolition of the towers that day would have been impossible.” goes to Blanchard’s/Protec’s article.)

³⁰³ Volume 12/4. A free copy of this “Skeptic” article might be available via http://www.accessmylibrary.com/coms2/summary_0286-29011876_ITM.

³⁰⁴ http://www.911myths.com/html/wtc_molten_steel.html, and linked pages.

³⁰⁵ The quote is an excerpt from the general part “*Purpose*” plus an excerpt from the section “*ASSERTION #5*”.

Blanchard/Protec address the claim from “*ASSERTION #5*” in four paragraphs. The following three of them are related to the phenomenon of exceptionally high temperatures at Ground Zero, quote³⁰⁶:

1. The vast majority of comments made by rescue workers, city officials or various others not involved in the actual demolition process at Ground Zero regarding the heat of underground fires or “molten anything” (steel, aluminum, tin, composites, etc.) are conjecture and have no practical value in determining what types of materials were actually burning and at what temperature. Most were simply never in a position to know, and those that were have acknowledged that they don’t know for sure.
2. Photographs that we have examined purporting to show demolition equipment extracting “molten steel” from the debris at Ground Zero are inconclusive at best, and most are inaccurate as described. Extracting various hot metallic compounds or debris is one thing, but “molten steel beams” is quite another. As a fundamental point, if an excavator or grapple ever dug into a pile of molten steel heated to excess of 2000 degrees Fahrenheit it would completely lose its ability to function. At a minimum the hydraulics would immediately fail and its moving parts would bond together or seize up. The heat would then quickly transfer through the steel components of the excavator and there would be concern for its operator. The photos we have reviewed on various websites do not show any of this, and if anything, indicate that the underground fires - while very hot – were not hot enough to melt steel.
3. In an effort to further research this assertion, we spoke directly with equipment operators and site foremen who personally extracted beams and debris from Ground Zero (several of whom have requested anonymity to prevent harassment). These men worked for independent companies in separate quadrants of the site, and many were chosen due to their extensive experience with debris removal following explosive demolition events. To a man, they do not recall encountering molten structural steel beams, nor do they recall seeing any evidence of pre-cutting or explosive severance of beams at any point during debris removal activities.

The phrase “... *the temperature and duration of underground fires ...*”, which is used by Blanchard/Protec in “*ASSERTION #5*”, does not reflect the thermite hypothesis³⁰⁷. However, one might get the impression, from Blanchard’s/Protec’s statements, that no valid sources with respect to the high temperatures/ persistent heat phenomenon existed, nor valid sources about something that resembled the appearance of “molten steel” in the WTC collapse piles. It will be shown below that Blanchard’s/Protec’s argumentation is inconclusive, and that it contains several features typical of disinformation.

Leaving out evidence

Some professional disciplines have to deal with ‘assertions’ on a regular basis. As a standard procedure the sources on which an assertion is based are considered in order to assess their validity, and then the validity of the assertion is evaluated. The evaluation follows certain rules that have already proved their utility. One fundamental rule is that you base the judgement on information from as broad a basis as possible: you consider as many independent sources as possible, and you do not deliberately exclude any potential sources. Blanchard/Protec seem to refer to this rule when they state in the general part of the article “A

³⁰⁶ The discussion in the fourth subsection deals mainly with tests for thermite residues on WTC steel and will not be discussed here.

³⁰⁷ The thermite hypothesis states that the exceptionally high temperatures and the persistent heat in the collapse piles are explained by molten iron, produced in thermite reactions. Molten iron is quite a different heat source from a fire.

CRITICAL ANALYSIS ...” (**quote**):

Beyond the above, Protec possesses several additional types of data and experience that place the firm in a unique position to analyze and comment on this event:

The enumeration that follows stretches across 40 lines, and includes the following statements (**quote**): “[...]”

In the weeks following 9/11, several Protec building inspectors and staff photographers, including this author, were contracted by demolition teams to document the deconstruction and debris removal processes at Ground Zero. These processes included the mechanical pull-down of the remains of the U.S. Customs Building (WTC 6) and various other activities occurring simultaneously throughout the site. Our teams took thousands of photographs and personally examined untold amounts of debris, including countless structural elements from WTC 1 and 2. [...]

Protec has been given access to thousands of personal photographs taken by laborers and site foremen employed by the demolition companies responsible for deconstructing the Ground Zero site. [...]

[...] In addition, we have [...] studied countless ground-based and aerial images captured by private, press and government-contracted photographers.

Blanchard’s/Protec’s statement above, the enumeration that follows, and Blanchard’s/Protec’s stated *effort to further research this assertion ...*” (see above, “3.”) is suitable to reassure the audience that Blanchard/Protec complied with the rule to base the judgement on information from as broad a basis as possible. Because Blanchard/Protec stress that their discussion was based on a broad data basis their statement “*PROTEC COMMENT: We have come across no evidence to support this claim.*” is suitable to lead one to assume that no evidence for any high temperatures/persistent heat phenomena at Ground Zero existed. But Blanchard’s/Protec’s actual discussion of “*ASSERTION #5*” is restricted to the topics “*photographs*”, “*comments*”, to the statements by the “*equipment operators and site foremen*”, and to thermite residues found on WTC steel³⁰⁸. Blanchard/Protec mention “*temperature and duration of underground fires*” in their hypothetical “*ASSERTION #5*”, but they fail to address the available thermal images. Thermal images are reliable sources to assess the extent and the “*duration of underground fires*” (and of other possible heat sources at Ground Zero).

Blanchard’s/Protec’s argument with respect to “*ASSERTION #5*” is inconclusive because they fail to address available evidence³⁰⁹.

The exceptionally high temperatures, and the persistent heat were certainly issues at Ground Zero (see Part I). It is not plausible that Protec, who worked at Ground Zero³¹⁰, did not know

³⁰⁸ See “4.” of Blanchard’s/Protec’s discussion.

³⁰⁹ Blanchard/Protec also do not mention the iron-rich spheres. This might be due to the chronological order (it may be the case that these spheres were only incorporated into the thermite hypothesis as evidence after Blanchard’s/Protec’s publication), or the iron-rich spheres are deliberately not mentioned by Blanchard/Protec. I do not know which explanation is applicable.

³¹⁰ Blanchard/Protec state in their general part: “*In the weeks following 9/11, several Protec building inspectors and staff photographers, including this author, were contracted by demolition teams to document the deconstruction and debris removal processes at Ground Zero. These processes included the mechanical pull-*

that thermal images were acquired or that exceptionally high temperatures and persistent heat were issues at Ground Zero. It is also not plausible that Blanchard/Protec “*studied countless ground-based and aerial images captured by private, press and government-contracted photographers*” but by chance missed all those aerial images that are thermal images. Note that Blanchard/Protec emphasize in their general part “*Purpose*” that “*Protec possesses several additional types of data and experience that place the firm in a unique position to analyze and comment on this event*” and that they spend 40 lines in this general part to enumerate the additional types of data they have.³¹¹ Both refer, at least indirectly, to the basic rule that you try to base your judgement on information from as broad a basis as possible. Given this, it is not plausible that Blanchard/Protec violated this basic rule unintentionally. You can conclude that they omitted some of the evidence deliberately.

Blanchard’s/Protec’s argumentation is in addition also inconclusive with respect to the topics “comments” and “photographs” they chose to consider.

Blanchard’s/Protec’s argument with respect to the “comments”

Blanchard/Protec do not state in the first sentence in “I.” (see above) that all “*comments*” lacked meaningfulness. Blanchard/Protec just claim that “*the vast majority of comments*” made by three named groups of people were “*conjecture*” and would “*have no practical value [...]*”. If you have a majority of comments you have a minority of comments as well. Blanchard/Protec do not make any statement about the minority of comments made by the three groups of people named in the first sentence. In addition, Blanchard/Protec do not make any statement about ‘comments’ made by people who were *involved in the actual demolition process at Ground Zero* but who were neither *rescue workers*, nor *city officials* (e.g. metal and construction workers, or engineers not employed as city officials). The argument in Blanchard’s/Protec’s first sentence does not address a good part of all the comments.

The second sentence in “I.” (see above) offers two possible interpretations. The first possibility is that the sentence is a general statement regarding all ‘comments’ that are related to “*Assertion #5*”. (Blanchard/Protec would eventually include all ‘comments’ in their argument.) But in this case the claim that “*those that were [in a position to know]*” would “*have acknowledged that they don’t know for sure*” implies that at least all of the people who worked at Ground Zero (these people were likely to be in a position “*to know*”) and who gave ‘comments’ related to the high temperature/persistent heat phenomenon at Ground Zero would “*have acknowledged that they don’t know for sure*”. Blanchard/Protec do not give any evidence to support this claim despite the fact that it is certainly not general knowledge that these ‘acknowledgements’ existed. If you consider in this respect the “molten steel” related article on the “debunking” website 911myths.com it is strongly suggested that such ‘acknowledgements’ exist only with respect to a few sources, but certainly not with

down of the remains of the U.S. Customs Building (WTC 6) and various other activities occurring simultaneously throughout the site.”

³¹¹ Some excerpts, **quote**: “*several Protec building inspectors and staff photographers, including this author, were contracted by demolition teams to document the deconstruction and debris removal processes at Ground Zero. [...] Our teams took thousands of photographs and personally examined untold amounts of debris, including countless structural elements from WTC 1 and 2. [...] 3. Protec has been given access to thousands of personal photographs taken by laborers and site foremen employed by the demolition companies responsible for deconstructing the Ground Zero site. The companies include Tully Construction, D.H. Griffin Wrecking, Mazzocchi Wrecking, Yannuzzi Demolition, Gateway Demolition and Manafort Brothers. [...] 4. [...] In addition, we have examined dozens of freelance and amateur video recordings incorporated into various documentary programs chronicling 9/11 and studied countless ground-based and aerial images captured by private, press and government-contracted photographers.*”

respect to all sources³¹². Blanchard's/Protec's claim that "*those that were [in a position to know]*" would "*have acknowledged that they don't know for sure*" has the quality of an unproven claim that is also most likely wrong.

The second possibility is that the claim in Blanchard's/Protec's sentence refers to their previous sentence (which is the first sentence in "*I.*"). The terms "*Most*" and "*those*" would refer in this case to the people who made the comments that are rated in the previous sentence as *conjecture* etc. In this case at least one problem discussed above remains, Blanchard's/Protec's statement would be inconclusive because a considerable part of the *comments* would have been excluded from the discussion.

Blanchard/Protec further state: "*In an effort to further research this assertion, we spoke directly with equipment operators and site foremen who personally extracted beams and debris from Ground Zero [...]. These men worked for independent companies in separate quadrants of the site, and many were chosen due to their extensive experience with debris removal following explosive demolition events ...*", and they state that "*equipment operators and site foremen who personally extracted beams and debris from Ground Zero*" "*do not recall encountering molten structural steel beams, nor do they recall seeing any evidence of pre-cutting or explosive severance of beams at any point during debris removal activities*". As standard practice a serious evaluation of sources includes that you check for consistencies and contradictions between the sources. Blanchard's/Protec's argument refers to this procedure, and one might get the impression from it that all "molten steel" sources are inconsistent with the observations by the "*equipment operators and site foremen*" mentioned by Blanchard/Protec.

But, firstly, these statements by "*equipment operators and site foremen*" are not necessarily inconsistent with the "molten steel" sources³¹³. Moreover, even if you want to interpret the "*do not recall encountering molten structural steel beams*" statements as contradictory to statements that claim sightings of "molten steel", you would have to start with two sets of contradictory sources. If you want to dismiss the "there was 'molten steel'" sources as inconclusive you have to give sound reasons. E.g., you might discuss why you think that all the "molten steel" sources were deliberately dishonest³¹⁴. Or, you discuss, based on facts, why

³¹² The *911myths.com* authors try to show that no reliable 'comments' and other sources existed, and in order to show this they post few 'acknowledgements not to know for sure'. If more 'acknowledgements ...' existed the *911myths.com*-authors would certainly have posted them in order to 'debunk' more sources. They did not. From the point of view of *911myths.com* it would make sense to 'debunk' as many 'comments' as possible. Conspicuously, the argument at *911myths.com* is limited to just a fraction of the 'comments' that can be found published on well known websites. (The number of sources they mention and discuss is restricted to seven statements by people, one statement from the website *wasteage.com*, one photograph, and the two AVIRIS/NASA thermal images. Two more statements regarding WTC 6 are mentioned as counter-examples; missing the point that parts of the North Tower fell into WTC 6.) The *911myths.com*-authors omit even 'comments' from their discussion that can be found at the very same website (<http://stopthelie.com/references.html>) that is quoted by them. The *911myths.com* article even provides the link to this website.)

³¹³ Ground Zero was huge and the areas of exceptionally high temperatures were limited to parts of it. That several Ground Zero workers did not encounter "molten steel" cannot prove that there was no "molten steel". It might be due to the fact that they worked in other parts. Someone, who wholeheartedly wanted to "*further research*" the "*assertion*" would have asked the "*equipment operators and site foremen*" not only if they personally saw "molten steel" but also if they had heard first-hand reports by others.

³¹⁴ For this you would need a sound hypothetical motive why, for example, a worker at Ground Zero should have deliberately lied about something with the appearance of "molten steel", and should have reported alleged "molten steel" when he did not see anything like this (note that someone might want to check it out if you report unusual things). Ground Zero was surely a very unlikely place to invent some stuff out of the blue. See for this some websites that describe the difficult and dangerous work, the emotionally stressful situation, and the immense technical problems faced by the people working at Ground Zero (e.g., at

you think that the primary sources were wrong in their interpretation of the molten material as “steel”. For example, you might state that a pool of molten steel looks very similar to a pool of the molten material xyz (you would have to add evidence for this claim) so it may have been molten xyz³¹⁵. Furthermore, you would have to assess which comments appear consistent with other sources, and which do not.

Only after such a discussion you might conclude that it was justified to dismiss one set of sources given that you want to treat the two sets as contradictory. However, Blanchard/Protec do not provide such a discussion. The mere existence of the mentioned statements (in undisclosed number) by “*equipment operators and site foremen ... [etc.]*” can alone neither disprove the existence of the “molten steel” phenomenon at Ground Zero, nor assist the discussion of “*Assertion ‘5’*”.³¹⁶

Blanchard/Protec state that the “*vast majority of comments [...] regarding the heat of underground fires or “molten anything” (steel, aluminum, tin, composites, etc.) are conjecture and have no practical value in determining what types of materials were actually burning and at what temperature.*” Given that they also state: “*We have come across no evidence to support this claim.*” the “*conjecture*” comments are dismissed by Blanchard/Protec as not relevant as evidence on the grounds that they would not be exact enough to be considered. This is arbitrary and nonsensical; imagine a detective who concludes that the alleged robbery did not happen at all on the basis that the majority of the testimonies provide some descriptions but not the names of the suspects³¹⁷.

<http://www.pbs.org/americanbuilds/profiles/index.html> and
<http://www.pbs.org/americanbuilds/engineering/index.html> and
www.firehouse.com/terrorist/911/magazine/gz/fenick.html.

³¹⁵ According to some articles, the observed “molten steel” would have been “more likely” aluminium. See, for example, the following **quote** from the “eSkeptic”: “*To many people, any grayish metal looks sufficiently like steel to call it “steel” when speaking informally. To actually establish that the substance in question is steel, we need analytical laboratory results using atomic absorption (AA) or another suitable test. It seems far more likely that the metal seen by the contractors was aluminum, a component of the WTC structural material that melts at a much lower temperature than steel and can look superficially similar to it.*” (Quoted from “9/11 Conspiracy Theories: The 9/11 Truth Movement in Perspective”, September 2006, see above.) However, neither molten iron (as product from a thermite reaction), nor molten steel can look “grayish”. The author fails to show how molten aluminium at a much lower temperature than molten steel or molten iron would look “superficially similar” to molten steel or molten iron. (Note, that any temperature results in a certain annealing colouring. Aluminium melts at a much lower temperature than steel but it will certainly not have at this much lower temperature the appearance in terms of colour of molten iron or steel. In addition, even if “*many people*” would call any grayish metal “steel” this can not justify to assume that people who were working professionally with aluminium and steel at Ground Zero would be unable to name a pool of molten aluminium correctly. Given all this, and the fact that there exist “molten steel” and “molten metal” sources but that there does not exist any “molten aluminium” source, the argument of the “Skeptic” appears as unsupported by any facts.

The controlled demolition hypothesis does interpret the “molten steel” as something else, namely as molten iron formed in a thermite reaction. However, molten WTC steel and molten iron with additives from a thermite reaction would in fact have a similar appearance. The difference between the two is limited to the different additives the iron contains.

³¹⁶ The article in the journal of the Skeptic Society that is based on the Blanchard/Protec article (see above) seems to be a summary of the Blanchard/Protec article. But the “Skeptic” feels free to change the sense as well. The fact that the term “*to a man*” refers only to a group of persons who were especially asked by Protec does not appear in their version, **quote**: “**5. A heat-generating explosive (thermite?) melted steel at ground zero.** Protec: *To a man, demolition workers do not report encountering molten steel, cut beams or any evidence of explosions. Claims of detected traces of thermite are inconclusive.*” A “Skeptic”-reader can get therefore the misleading impression that all Ground Zero demolition workers “*do not report encountering molten steel ...*”.

³¹⁷ It is in addition not realistic to expect that rescue workers, fire-fighters, or construction workers would have taken time off from their duties to perform exact temperature measurements and chemical analyses at Ground Zero (both of which needed equipment, and for the chemistry much know-how too). Note that the version in major media at this time was that the pre-collapse jet fuel fires melted the steel. To interpret something that

Inconclusive discussion of photographs

Blanchard/Protec state that the photographs they examined were “*inconclusive at best, and most are inaccurate as described*”. But they do not support their claim with any evidence, they do not even state which photographs they examined³¹⁸. The statement is just an unproven

looked like “molten steel” as molten steel for the background of newspaper headlines like “*Jet fuel-fed fire may have melted steel in towers*” was in this situation reasonable, and maybe this was exactly what was intended by those who produced such headlines. Headline quoted from baltimoresun.com, September 12, 2001, (see above).

³¹⁸ The website 911myths.com provides an example, they try to “debunk” the well known photograph by Frank Silecchia. See the following **quote** (from 911myths.com): “[...] *Now maybe it’s just us, but we have some problems with that.*

First, there’s no proof here other than the caption of when and where this was taken.

Second, whatever’s glowing red here clearly isn’t isn’t “molten” in the sense of “melted”. There may possibly be something dripping off one end, but we don’t know what that is.

Third, there seems an odd lack of conduction amongst the materials being picked up. We can see that the excavator has picked up a considerable amount of nearby material that presumably was very close to the same heat source, and it looks like glowing metal, but it’s completely black. There’s no orange -- bright red -- dull red transition across the materials, it’s just a straight orange to black. Steel isn’t a good conductor of heat, it’s true, but is that enough to explain the photo?

Regarding the first two objections by 911myths.com: In general sources like Silecchia’s photograph rarely include an attached notarization giving “*proof*” that the photograph was in fact taken as stated in the caption. You do not dismiss such a source as inconclusive only for the reason that “*there’s no proof here other than the caption ...*”. Instead, you try to validate it. You would only dismiss such a source for sound reasons. In the given case you would have to explain why Silecchia’s photograph might be a fake and/or why the caption might be dishonest. But the place and the year of the publication of this photograph suggest that the photograph and the caption were published only with the best of intentions and in good faith. See a **quote** from the website wtcgodshouse.com, where the photograph was published in 2002:

This site is dedicated to all the people who lost friends and family in the terrorist attacks on September 11th 2001, and to all the wonderfully courageous and patient workers, firemen and policemen who have given of themselves in order to clean up and protect the city of New York.

My name is Frank Silecchia. I am one of the many WTC Ground Zero workers who was devastated by what I saw and encountered after the Twin Towers collapsed. In the midst of all the sorrow however, I did discover a glimmer of hope when I found this solid steel cross in a heap of rubble. Finding this cross brought me to realize the importance of faith and hope at a time like this. It was as if - in that given moment - God had spoken to my heart and showed me that everything somehow was going to alright.

So I’m passing on my reflection of faith to others, all New Yorkers and those of you all over the country and all over the world!! [WTC God’s House](http://wtcgodshouse.com) will be a site where people can see pictures of the cross and of groundzero, read poems and essays written in dedication to WTC or inspired by the WTC tragedy and so on. I encourage anyone who visits this site to send me poems, essays, photos, drawings, etc. that you would like to have published on this site. It will be in remembrance of those we lost - a haven where we can grieve together, but also a beacon of faith for all of us. Please join me in my efforts. Thank you and God Bless.

(Quoted from <http://web.archive.org/web/20020609003743/www.wtcgodshouse.com/index.html>.)

claim. Note, that even Blanchard/Protec themselves only rate “most”, but not all, of the photographs they examined as “inaccurate as described”³¹⁹.

When Blanchard/Protec state “As a fundamental point “ that the equipment would fail if it dug into something in excess of 2000 degrees Fahrenheit, something fundamental about the equipment is said but nothing of relevance regarding “ASSERTION #5”. In general, equipment operators who are supplied with information about the location of hot spots (which might be based on thermal images, for example) are certainly able to dig only at places that will not damage the equipment. Moreover, according to the U.S. Department of Labor there existed problems with the equipment at Ground Zero, **quote**³²⁰: “As the huge cranes pulled steel beams from the pile, safety experts worried about the effects of the extreme heat on the crane rigging and the hazards of contact with the hot steel. And they were concerned that applying water to cool the steel could cause a steam explosion that would propel nearby objects with deadly force. Special expertise was needed. OSHA called in structural engineers from its national office to assess the situation. They recommended a special handling procedure, including the use of specialized rigging and instruments to reduce the hazards.”

The conclusion in Blanchard’s/Protec’s sentence: “The photos we have reviewed on various websites do not show any of this, and if anything, indicate that the underground fires - while very hot – were not hot enough to melt steel.” is not linked to the thermite hypothesis they claim to discuss. The thermite hypothesis does not propose that underground fires were hot enough to melt steel, quite in opposite. The claim that the fires were hot enough to melt steel is normally used to explain the “molten steel” sources as consistent with the official government account of 9-11, see, the suggestion on the fact sheet by NIST, or “Iron Burns!!!” at debunking911.com (see above). To state that the fires were not hot enough to melt steel does not disprove the possibility that there was molten iron from thermite reactions in the collapse piles.

In addition, the fact that you can see steel (or other material) on Ground Zero photographs that glow in colours that indicate very high temperatures, does not exclude the possibility that there was material in the WTC collapse piles that was even hotter.

Note, that Protec themselves included “temperatures [...] of underground fires” as evidence in “ASSERTION #5”. But when they state that “The photos [...] if anything, indicate that the

An obvious purpose of this website wtcgodshouse.com was the propagation of Christian faith and three out of the five Ground Zero photographs shown on two pages of the site (homepage and first link to more photos) feature the steel cross that was found by F. Silecchia, and which was later erected at Ground Zero. Other features of the site, as mirrored in web.archive.org, were, for example, poems and links to groups that provide support for persons affected by 9-11. I cannot imagine any motive why this website from 2002 should feature a faked “molten steel” at Ground Zero’ photograph and/or a dishonest caption. Moreover, it makes no sense to make a website with a faked photograph and/or a dishonest caption but dedicate the website to the “workers, firemen and policemen who have given of themselves in order to clean up”, i.e., exactly those people who are likely to detect any fakes regarding Ground Zero.

The “odd lack of conduction amongst the materials being picked up” is not a convincing argument for doubting the validity of this photograph either. The workers who picked up the hot material may have intentionally wrapped it in cooler material to protect the equipment.

(The link via web.archive.org to the relevant site

<http://web.archive.org/web/20020609005905/www.wtcgodshouse.com/photos.html> worked perfectly in May/June 2007. It still works, however the relevant photograph has now vanished from the mirrored site and is replaced by an empty frame. The caption is still there. The photograph can be easily found documented on many websites.)

³¹⁹ It is not clear if Blanchard/Protec use the term “inaccurate” in the sense of ‘wrong’ or in the sense of ‘imprecise’. The use of imprecise terms is quite common in daily life and you would not dismiss a source as invalid just because of the use of imprecise terms.

³²⁰ Quoted from http://www.osha.gov/Publications/WTC/dangerous_worksite.html. See longer quote above in Part (I).

underground fires - while very hot – were not hot enough to melt steel.” they fail to explain how it could be possible to have in dust covered, oxygen starved collapse piles fires that are burning “very hot”³²¹.

Blanchard’s/Protec’s article as disinformation

The article was written by B. Blanchard, “*Director of Field Operations at Protec Documentation Services, Inc.*” and “*Senior Editor for Implosionworld.com.*” Blanchard was supported by four Protec employees who provided “*contributions and research assistance*”. The article states, **quote**:

Protec is one of the world’s most knowledgeable independent authorities on explosive demolition, having performed engineering studies, structure analysis, vibration/air overpressure monitoring and photographic services on well over 1,000 structure blasting events in more than 30 countries.

Protec lists inter alia NASA as a customer³²², and it is safe to assume that Protec’s “*Director of Field Operations at Protec Documentation Services*” and that Protec’s employees are capable of performing precise assessments³²³. It is therefore unlikely that Blanchard and the four Protec employees were unaware of the many flaws in their discussion of “*Assertion#5*”. They must also be aware that unproven claims are not a “*factual analysis*”. Based on this and on the fact that Blanchard/Protec exclude thermal images from the argument it is possible to conclude that Blanchard’s/Protec’s article is intentionally fabricated disinformation. There are some additional features in the this article³²⁴ that further support this conclusion:

Putting authority in place of evidence

In the general part Blanchard/Protec provide a statement that can be considered as a kind of explanation why their discussion does not feature references and does not allow the reader to follow the argument, **quote**:

A final note: Before releasing this report, we reviewed every paragraph and tried to simplify the verbiage and technical vernacular as much as possible. Our thinking is the more people who understand this analysis, the more benefit it might provide. It is given that each of the points below could (and likely will) be extrapolated upon in far greater detail by others, however the intent here is to offer our comments as succinctly and cohesively as possible.

³²¹ See above (Rewriting metallurgy) about NIST’s burn test of the “*rubbelized*” version, and the influence of the air access on the heat release rate.

³²² Source: <http://www.protecservices.com/clientele.htm> Quote (from this website): “*Protec has performed critical vibration and inspection consulting services for more than 500 clients on five continents.*”

³²³ Quote: (from <http://www.protecservices.com>):

“*Protec is recognized as a global leader in the field of Vibration Prediction, Monitoring, and Structure Inspections.*

For over 30 years, Protec personnel have studied the effects of vibrations on structures as related to construction, demolition and blasting operations. From the world’s largest building implosions to the smallest road-reconstruction jobs,

Protec has performed critical documentation and vibration monitoring services on thousands of domestic and international projects. Beyond addressing potential damage claims, each program is specifically designed to maximize project efficiency and document regulatory compliance, thereby strengthening the client’s reputation and mitigating insurance costs.”

³²⁴ Only “*ASSERTION #5*” with the points (1.), (2.) and (3.) and the general introduction (under the headline “*PURPOSE*”) are considered here. The whole article contains more questionable statements and features. See for example the website www.911research.wtc7.net/review/blanchard/index.html.

However, Blanchard/Protec can hardly expect that anyone will believe their claims when they are not supported by evidence. Blanchard/Protec do exactly what they need to enhance their chances in this respect: they spend many lines and words to emphasize that they have authority regarding the subject. It is a known fact that human beings are much more likely to believe a statement when it is backed by relevant authority. Blanchard/Protec stress their authority directly, **quote:**

“Protec is one of the world’s most knowledgeable independent authorities on explosive demolition, having performed engineering studies, structure analysis, vibration/air overpressure monitoring and photographic services on well over 1,000 structure blasting events in more than 30 countries.”

And quote:

“Rather this is a reasoned, factual analysis of a single group of questions and allegations that fall within our specific area of expertise.”

And quote:

“Beyond the above, Protec possesses several additional types of data and experience that place the firm in a unique position to analyze and comment on this event: [here follows the enumeration of the additional types of data and experience, see above]”

Blanchard/Protec spend about 822 words (75 lines) in the general part emphasizing their authority. This compares to about 3700 words (305 lines) used to write down all their arguments related to the WTC³²⁵. Blanchard/Protec also refer to their article seven times with the term “*analysis*”.³²⁶ They resort to a tactic that is typical of disinformation: you use many lines to underline your authority yet you do not provide valid evidence.

Making the reader feel responsible for being unable to follow the line of reasoning

With the statement in Blanchard’s/Protec’s “*final note*” (see above) (**quote**):

“we reviewed every paragraph and tried to simplify the verbiage and technical vernacular as much as possible. Our thinking is the more people who understand this analysis, the more benefit it might provide.” it is suggested that their article was conclusive and that it would be possible to *understand* what is euphemistically called *analysis*. Moreover, it is suggested that any problems a reader might have with following Blanchard’s/Protec’s claims would be due to it not being simplified enough. This suggestion puts the reader onto the defensive if she or he cannot *understand* Blanchard’s/Protec’s so-called “*analysis*”.

Some readers might prefer to assume that they are “able” to “*understand this analysis*” but this means that they have to agree with Blanchard’s/Protec’s claim, and some readers might feel that it would be their own fault if they find Blanchard’s/Protec’s assertions unconvincing. It is a typical disinformation tactic to put the reader on the defensive in this kind of way. In fact, the discussion in “*ASSERTION # 5*” does not contain any analysis that you could understand, but instead unsubstantiated claims. In addition, Blanchard’s/Protec’s argument is partly confusing,³²⁷ and lacks logic.³²⁸

Stirring emotions:

The statement in “3.” “... *several of whom have requested anonymity to prevent harassment*” would make sense if Protec provided other references³²⁹ in their discussion of “*Assertion #5*”.

³²⁵ This is “*ASSERTIONS # 1*” to “*#8*” including discussions. “*ASSERTION #9*” does not discuss the collapses in the WTC.

³²⁶ See, for example the headline “*A CRITICAL ANALYSIS ...*”.

³²⁷ See that the second sentence in “1.” can be interpreted as a general statement or as an explanation with respect to Protec’s previous sentence.

³²⁸ See, for example, the last sentence in “2.”

However, Protec gives no references regarding the *comments*, nor regarding the photographs, nor regarding those “*equipment operators and site foremen*” who did not request anonymity. The reader is not even informed how many “*equipment operators and site foremen*” were consulted by Protec, and how many gave an answer. However, if Protec does not provide information in this regard (and no references at all) it seems odd that there is the information that “*several [...] have requested anonymity to prevent harassment*” in Protec’s argument. This information is of no value in the discussion of “*ASSERTION #5*”. (Note that Protec writes in their general part that they “*reviewed every paragraph*” and that they would have intended “*to offer*” their “*comments as succinctly and cohesively as possible*”). It is worth discussing the implication of the statement “*several of whom have requested anonymity to prevent harassment*”. A reader might conclude from this that the questioning of the official account of 9 - 11 must have led in parts of the U.S. to such a climate of fear that Ground Zero workers were not willing to be named as witnesses regarding the “molten steel” issue. It makes no sense to assume that the Ground Zero workers would fear harassment by government agencies, by their employers, or by someone else who supports the official account (because their statement would be in support of the official account). It is therefore implicitly suggested that they feared harassment from those members of the public who are questioning the official account. The statement is suited to stir emotions against the questioning of the official account and to defame it. However, stirring up emotions against those persons or groups that you oppose is a typical method of disinformation³³⁰.

Confused language and misleading terms

Blanchard/Protec use clear, exact language in the general part of the article where they are eager to stress their authority and experience, and they use clear, exact language when they are explaining some matters of fact, e.g. that certain equipment loses its ability to function at high temperatures. In contrast, in those parts that are important for the discussion of whether evidence exists that supports the thermite hypothesis Blanchard’s/Protec’s line of reasoning is confusing.

If you strip the first sentence in “(I.)” down to the very core you will get the statement “*The ... comments ... are conjecture and have no practical value.*” This, of course, is no longer the exact sense of the statement as written by Blanchard/Protec. However, this is the statement that might stick in the memory of a reader, and this is also the statement that Blanchard/Protec needed to support their claim “*We have come across no evidence to support this claim.*” The confusing argument in “(I.)” would easily be explainable if you assume that Blanchard/Protec ‘decorated’ the core statement “*The ... comments ... are conjecture and have no practical value.*” in order to disguise that they are not providing any evidence.

Confusing statements can ‘work’ well for disinformation purposes. Before you are able to make up your own mind about Blanchard’s/Protec’s so-called “*factual analysis*” of the

³²⁹ For example: “The request was answered by operator A. Smith from company X., side foremen B. Smith, from company Y, etc., and by four contractors who cannot be named here because they “*requested anonymity to prevent harassment*”.

³³⁰ It is hardly possible to find out if the statement by Protec is based on facts or not. But I cannot help being puzzled by not only one or two but *several* former Ground Zero workers lacking the courage to give their names. In addition, there is an inherent contradiction in Protec’s statement. According to Protec the WTC went down without thermite, so there cannot have been pools of molten iron (or so-called “molten steel”) at Ground Zero, but only some gossip in this regard. If there would not have been “molten steel” at Ground Zero all workers (including the “several” ones who wanted anonymity) would know many other workers who would join in stating that they did not encounter “molten steel”, and no worker can ever have spoken to someone who actually saw “molten steel” at Ground Zero. This is a safe position to attest that you did not see “molten steel”: you know that your statement was right, you know that your statement was not deliberately misleading, you know that all your former co-workers would potentially support your statement in the case that it was attacked. So why should several workers not have the courage to give their names, given that their statement would even be in support of the government account?

comments you have to come to terms with the fact that the second sentence in “(I.)” has two different possible meanings. After this you have to consider both possibilities separately. To do so you must research how many comments exist, and how likely it was that anyone of *those that were [in a position to know]* would “*have acknowledged that they don’t know for sure*”. Protec’s statement in “(I.)” is deliberately confusing.

Blanchard/Protec state that they discuss “*questions and allegations that fall within our specific area of expertise*”. It is unlikely that professionals unknowingly use imprecise or wrong terms or phrases in their *specific area of expertise*. But Blanchard/Protec repeatedly use incorrect terms or phrases in respect to the thermite hypothesis. See their use of the terms and phrases “... *the temperature and duration of underground fires ...*”, “*encountering molten structural steel beams*”, or “*determining what types of materials were actually burning*”. Protec/Blanchard prefer to misrepresent the thermite hypothesis in their argument. By using these terms and phrases Blanchard/Protec avoid drawing the attention of readers to the very hot, molten iron that is produced in the typical thermite reaction.

Blanchard/Protec exclude evidence from the argument, they avoid giving a valid account of the thermite hypothesis in their argument, they put authority in place of evidence, they try to stir emotions against the questioning of the official account of 9-11, they try to put the reader on the defensive if she or he cannot “*understand*” their so-called “*analysis*”, they use confusing and inconclusive arguments despite the fact that they are otherwise capable of performing precise assessments. Blanchard’s/Protec’s argumentation has not one but several features of disinformation, and any single one of them does indicates that Blanchard’s/Protec’s publication is disinformation. The article by Blanchard/Protec is disinformation and this disinformation is promoted by The U.S. State Department. Not just by some employees who have never heard the word disinformation but by the misinformation and disinformation specialist(s) of the U.S. State Department, Bureau of International Information Programs.³³¹

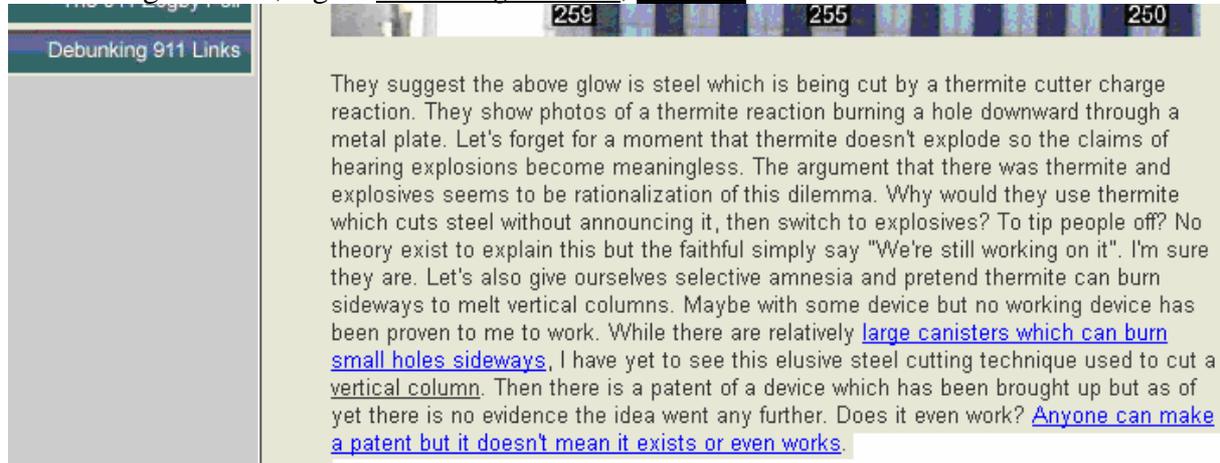
³³¹ The State Department states, **quote:**

The screenshot shows the USINFO.STATE.GOV website. The header includes the US Department of State seal and the text 'INTERNATIONAL INFORMATION PROGRAMS USINFO.STATE.GOV'. Below the header is a navigation bar with 'Topics', 'Regions', 'Resource Tools', and 'Products'. There are also language options: 'Español | Français | Русский | عربي | 中文 | فارسی'. The main content area is titled 'Identifying Misinformation' and includes a breadcrumb trail: 'You Are In: USINFO > Resource Tools > Identifying Misinformation'. Under the heading 'About Us', there is a paragraph stating: 'The "Identifying Misinformation" web collection is written by the U.S. Department of State's counter-misinformation officer, who has 13 years of experience in this area. He has extensive experience in researching deliberate disinformation spread by countries such as the Soviet Union and Saddam Hussein's Iraq, as well as urban legends and conspiracy theories. The counter-misinformation officer has authored several reports in this area, including:'. A bulleted list follows: '• The Child Organ Trafficking Rumor: A Modern "Urban Legend," a 1994 report to the United Nations', '• Soviet Active Measures in the "Post-Cold War" Era, a 1992 report to the U.S. Congress, which is available [online](#).', and '• Soviet Active Measures in the Era of Glasnost, a 1988 report to the U.S. Congress.'

Quoted from http://usinfo.state.gov/media/Archive_Index/About_Us.html. You cannot work for 13 years as a specialist in disinformation and not recognise that the Blanchard/Protec article is disinformation. It might be not just this one person who is responsible for all the [disinformation-] pieces about 9-11 on these State Department websites. They have a “*counter-misinformation team*”, **quote:** “*Finally, if the counter-misinformation team can be of help, ask us. We can’t respond to all requests for information, but if a request is reasonable and we have the time, we will do our best to provide accurate, authoritative information.*” Quoted from <http://usinfo.state.gov/media/Archive/2005/Jul/27-595713.html>.

Addendum: Is thermite used in controlled demolitions? Molybdenum rich spheres in the WTC dust and molybdenum used in shaped charges capable to cut through high-strength armor steel.

At least the Blanchard/Protec article helps to elucidate if thermite is used in controlled demolitions, or if thermite is unknown to this profession. The latter claim is made in “debunking” articles, e.g. at debunking911.com, **quote**³³²:



Similarly it is stated in the “Journal of Debunking 911 Conspiracy Theories, Volume 1, Issue 2” in the article “*Good Science and 9-11 Demolition Theories*” by Mike King, **quote**³³³:

But the link between molten steel and controlled demolition is non-existent, as thermite is not used in controlled demolition. Hence Jones requires a variation on controlled demolition: controlled demolition plus the use gratuitous and incompetent use of thermite. We have to believe that the conspirators had researched controlled demolition so badly as to decide on the use of thermite.

But Blanchard/Protec state (**quote**): “*It is also unusual that no demolition personnel at any level noticed telltale signs of thermite’s degenerative “fingerprint” on any beams during the eight months of debris removal.*”

It is nowhere stated that Ground Zero workers were trained after 9-11 to notice *telltale signs of thermite’s degenerative “fingerprint” on [...] beams*. But Blanchard’s/Protec’s argument implies that “*demolition personnel*” were able to notice the “*telltale signs of thermite’s degenerative “fingerprint” on [...] beams*”. Protec documented “*over 1,000 structure blasting events in more than 30 countries*”, they are able to assess the knowledge that *demolition personnel* have of *thermite’s degenerative “fingerprint”*.”

You certainly would use explosives in a controlled demolition after you had impaired the steel columns with thermite (or with other devices). If you just cut the steel the building might be in serious danger of collapse but it might remain standing for a while, or it might topple over. But if pressure pulses from explosions dislocate the impaired steel columns the building might come down in a controlled manner. On the other hand, you have to impair the steel columns first in a steel frame building if you want to bring it down. If you just used explosives you would either blow up the concrete and wallboard but the main steel frame would remain standing, or you would need extremely large explosions in order to dislocate the steel beams. The argument by debunking911.com in this regard (“*Why would they use thermite [...] then switch to explosives?*”) is therefore nonsense.

³³² Quoted from <http://www.debunking911.com/moltensteel.htm>.

³³³ Quoted from http://www.jnani.org/mrking/writings/911/king911.htm#_Toc144445988 (“*Latest revision: 13 May 2007*”).

However, the “debunkers” are right insofar as the controlled demolition industry also uses another device to impair steel. See the following statement by Stacey Loizeaux, daughter of the president of Controlled Demolition Incorporated, which she gave in 1996. She already had about 11 years first hand experience in controlled demolition at this time. **Quote**³³⁴:

NOVA: What do you look for in an explosive?

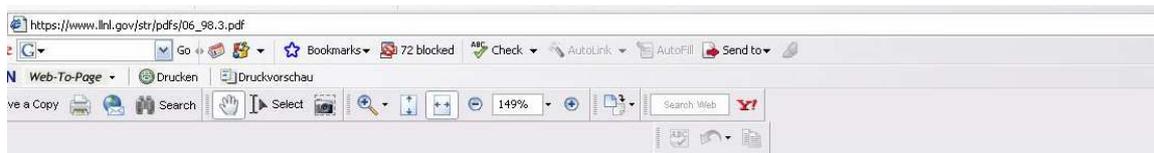
SL: Velocity. You have two different types of explosives. You have low order and high order. A low order explosive is like what they used when they bombed the Oklahoma City building—that's ANFO, ammonium nitrate and fuel oil. It's a very slow, heaving explosion. It tends to push more than it does shatter. The explosive we look for is a shattering explosive. What we want to do is instantaneously remove the integrity of the columns or whatever we're working on. That's what we look for in nitroglycerin or NG-based dynamite. With a steel building, we use something called a linear shaped charge. It's the same explosive they use to sever the fuel tank off the Space Shuttle, when they launch.

Some information about shaped charges is contained in the following **excerpt**³³⁵:

³³⁴ This and the following **quote** in the footnote are from: <http://www.pbs.org/wgbh/nova/kaboom/loizeaux.html>, interview with Stacey Loizeaux.

Stacey Loizeaux, twenty-six years old, has worked for Controlled Demolition, an international explosives engineering firm, since the age of fifteen. She learned the fine art of demolition from her father, Mark Loizeaux, and her uncle, Doug Loizeaux—president and vice-president of the company. NOVA spoke with Ms. Loizeaux a few days before Christmas, 1996.

³³⁵ Quoted from www.llnl.gov/str/pdfs/06_98.3.pdf.



Research Highlights

Shaped Charges Pierce the Toughest Targets

In early 1997, Lawrence Livermore successfully tested a shaped charge that penetrated 3.4 meters of high-strength armor steel. The largest diameter precision shaped charge ever built produced a jet of molybdenum that traveled several meters through the air before making its way through successive blocks of steel (Figure 1). A shaped charge, by design, focuses all of its energy on a single line, making it very accurate and controllable. When size is added to that accuracy, the effect can be dramatic. The success of this demonstration at the Nevada Test Site's Big Explosives Experimental Facility would not have been possible without the combination of reliable hydrodynamic codes and diagnostic tools that verify one another.

Leaving Trial and Error Behind

Early work on shaped charges showed that a range of alternative constructions, including modifying the angle of the liner or varying its thickness, would result in a faster and longer metal jet. These research and development efforts to maximize penetration capabilities were based largely on trial and error. It was not until the 1970s that modeling codes could predict with any accuracy how a shaped charge would behave. While the concept of a metal surface being squeezed forward may seem relatively straightforward, the physics of shaped charges is very complex and even today is not completely understood.

Today, a Livermore team headed by physicist Dennis

The noteworthy detail is that the shaped charge described in the above excerpt uses a “jet of molybdenum”. Molybdenum rich spheres were found in the WTC dust by the USGS study³³⁶. Molybdenum has many technical applications. It is used, for example, in electronics and as an alloy in steel. The molybdenum in WTC dust might have come from such applications. But it might be useful to check if the physical characteristic of the detected molybdenum rich spheres from the WTC corresponds with the molybdenum as used in shaped charges. It is conceivable that both, thermite and shaped charges, were used in the WTC. The shaped charge described in the above article is a ‘coned shaped charge’. However, if you use molybdenum in cone shaped charges you might also use it in linear shaped charges as well³³⁷.

³³⁶ See <http://www.journalof911studies.com/articles/WTCHighTemp2.pdf>, pages 5f.

³³⁷ Some general information about shaped charges can be found on <http://www.globalsecurity.org/military/systems/munitions/bullets2-shaped-charge.htm>.

Conclusions

(I) Disinformation as a source of information

The general motive behind the articles and excerpts discussed above is obvious; it is to avert a thorough investigation of what happened actually on 9-11. It is natural that those who fabricate, commission, and/or distribute disinformation do not do this to satisfy any needs for information. Nevertheless, any disinformation piece is inevitably a meaningful source of information: (1) It conveys that someone intends to deceive the targeted audience. (2) It conveys that someone is short of honest arguments that may support his/her case. (3) It conveys that those who commission or fabricate the disinformation consider the effort required as necessary and worthwhile. And (4), it conveys that these institutions that knowingly publish and distribute disinformation consider the inherent risk of damaging their reputation to be necessary and worthwhile.

(1) You can conclude from the existence of the articles and excerpts discussed above that NIST, Blanchard/Protec/implosionworld.com, M. Ferran/debunking911.com, and F.R. Greening/911myths.com all intend to deceive the audience with respect to the phenomenon of exceptionally high temperatures and persistent heat at Ground Zero. You can conclude from the existence of the above discussed mass media articles that Associated Press and several mainstream media (the BBC, The Washington Post, “der Spiegel”, the Nation) all intend to deceive the audience in respect of the broader subject of questioning the official account of 9-11 (this subject implies the high temperatures/persistent heat phenomenon at Ground Zero). In addition, there is reason to assume that the ‘big media’ that distributed the AP article, like CNN, ABC, and FOX News, are well aware that the AP article is disinformation³³⁸. They distributed it with the intention to deceive their audience.

(2) You can conclude that the authors of the discussed articles must be short of conclusive arguments to support their case with respect to the heat phenomenon³³⁹ and/or with respect to inconsistencies between verifiable observations and the official account of 9-11 in general.

³³⁸ Someone might argue that the disinformation in mass media is just due to individual authors who write the pieces and manage to get them published. But this is certainly not the case. There obviously exists a strict media agenda with respect to 9-11. A significant indication for this is the pattern that you can find the most sophisticated disinformation pieces regarding 9-11 specially in the most influential mass media, an odd silence in most other media, and the few informative articles specially in smaller independent papers, or even in odd places like in certain magazines or supplements where you normally not would expect to find articles of political relevance. The pattern can be confirmed easily with any suitable content analysis. In addition, there exist cases of journalists who experienced problems for not complying with the media agenda. It is not to assume that every editor of a small local paper that uses Associated Press articles for their national pages and published the AP article wanted to deceive the audience. He/she might be unaware of the disinformation qualities of the AP article. But ‘big media’ like ABC, CNN, FOX NEWS, The Washington Post and the news provider Associated Press itself will certainly only distribute an article about a subject like “9-11 conspiracy theories” after securing that the article is in line with the strict media agenda that they have imposed on themselves. Note, that Associated Press is cooperatively owned by U.S. media. It is governed by a board of 18 or more directors that includes currently D. Westin, (president, ABC News), V. Ganzi (president and CEO, Hearst Corporation), R. Murdoch (chairman and chief executive officer, News Corp.), B. Jones (publisher and CEO, The Washington Post, see <http://www.ap.org/pages/about/about.html> and <http://www.ap.org/pages/about/board.html>).

³³⁹ That Ferran and Greening have to resort to disinformation in order to “debunk” the theory that thermite was used corroborates indirectly the controlled demolition hypothesis and the proposed use of thermite. Likewise, it is at least conspicuous that NIST, Blanchard/Protec, Ferran, and all the discussed media pieces avoid providing a correct representation of the thermite hypothesis. Notably, it is not mentioned that the proposed thermite reaction produces hot molten iron, and that this hot molten iron provided an explanation for the exceptionally high temperatures and the persistent heat at Ground Zero.

(3) It requires effort to fabricate disinformation: you have to figure out which strategies might serve your purpose; and you have to implement the strategies. Furthermore, to author a disinformation piece that ‘works’ you have to anticipate the typical mindset and background of your target audience, and you have to know the typical level of knowledge of your target audience on the topic. All the media articles discussed above are noticeably tailored for the target audience: the arguments used match the typical audience of the media, while the information they might ‘give away’ is limited. To author disinformation that uses manipulating language, as several of the above discussed articles and excerpts do, needs, in addition, special skills based on knowledge of psychology, linguistics, and communication studies³⁴⁰. The existence of the disinformation pieces discussed above conveys that persons and/or circles who are able to influence what is published, on such an important matter as 9-11, by NIST, by Associated Press, by the BBC, and by several other influential mass media, considered the effort to fabricate the disinformation pieces as necessary and worthwhile.

(4) An institution that makes a living out of providing information needs a reputation for being objective in order to be successful. If you cannot trust a provider of information there is no point in consulting it. NIST, Associated Press and mainstream mass media are certainly aware of the importance of being regarded as objective and independent. Both, NIST and Associated Press, for example, issued statements that stress that they were objective, independent and reliable.

NIST stated in 2005, **quote**³⁴¹:

*“When we began our work, we said that our investigation would be **thorough, open, independent, and result in meaningful recommendations**. We have done that to the very best of our ability, and I believe that we have succeeded. Let me elaborate, briefly. [...] **Independent**. Independence, objectivity, and impartiality are hallmarks of all NIST work, including our building failure investigations. The conclusions of our investigation and our recommendations have been developed after extensive information gathering—but they are NIST’s findings and recommendations and reflect no influence by any other organization. Bluntly, we are telling it like it was.”*

The Associated Press website states, **quote**³⁴²:

“Facts

The Associated Press is the backbone of the world’s information system serving thousands of daily newspaper, radio, television and online customers with coverage in all media and news in all formats. It is the largest and oldest news organization in the world, serving as a source of news, photos, graphics, audio and video.

³⁴⁰ It fits well that you find the most skilful use of manipulative language and other disinformation tactics in the publications of NIST, Associated Press, and Blanchard/Protec – it is as if the available ‘disinformation-resources’ were deployed in such a way to give the best resources to the articles with the broadest impact on the U.S. audience.

³⁴¹ Remarks by Dr. Hratch Semerjian, Acting Director, National Institute of Standards and Technology, Technology Administration, U.S. Department of Commerce, World Trade Center Investigation Report Press Briefing, June 23, 2005 http://wtc.nist.gov/pubs/semmerjian_remarks_62305.htm (The bold print is a feature of the original.)

³⁴² <http://www.ap.org/pages/about/about.html>

AP's mission is to be the essential global news network, providing distinctive news services of the highest quality, reliability and objectivity with reports that are accurate, balanced and informed. [...]

The Associated Press is the essential global news network, delivering fast, unbiased news from every corner of the world to all media platforms and formats. Founded in 1846, AP today is the largest and most trusted source of independent news and information. [...]

And **quote**³⁴³:

*“THE ASSOCIATED PRESS STATEMENT OF NEWS VALUES
AND PRINCIPLES*

For more than a century and a half, men and women of The Associated Press have had the privilege of bringing truth to the world. They have gone to great lengths, overcome great obstacles – and, too often, made great and horrific sacrifices – to ensure that the news was reported quickly, accurately and honestly. Our efforts have been rewarded with trust: More people in more places get their news from the AP than from any other source.

[...] But always and in all media, we insist on the highest standards of integrity and ethical behavior when we gather and deliver the news.

That means we abhor inaccuracies, carelessness, bias or distortions. It means we will not knowingly introduce false information into material intended for publication or broadcast; nor will we alter photo or image content. Quotations must be accurate, and precise. [...]

It means we avoid behavior or activities that create a conflict of interest and compromise our ability to report the news fairly and accurately, uninfluenced by any person or action.[...]

By publishing disinformation NIST, Associated Press and other mass media infringe values such as objectivity and impartiality. By doing so on a subject as important as 9-11 they risk losing any reputation that is based on the presumption that they would provide independent, fact based information and statements as objectively as possible. They risk being ultimately regarded as dispensable/redundant. That NIST, Associated Press and well known mass media nevertheless publish and distribute disinformation on an issue as important as what caused the collapse of the WTC and/or what actually happened on 9-11, conveys that the policy makers of these institutions consider it necessary and worthwhile to take the high risk that comes with it. As how ‘necessary’ and ‘worthwhile’ they consider the possible damaging effect on their reputation is underlined by the fact that Associated Press, other mass media, and the Skeptic Society (as represented by their publication “eSkeptic”) regard it even as necessary and worthwhile to distort the common understanding of what is science.

If the Twin Towers and WTC 7 collapsed as it is claimed in the official account, namely as a result of an attack by “Islamic extremists”, there would be no motive to deceive the public in order to avert a thorough investigation of what happened on 9-11. In addition, there would be no conceivable reason why those responsible for commissioning, fabricating, and distributing the discussed disinformation pieces should consider the effort, and/or the possible damaging

³⁴³ <http://www.ap.org/newsvalues/index.html>

effect on the reputation of the institutions and mass media involved, as necessary and worthwhile.

If the official account of 9-11 were correct the above discussed disinformation pieces and the distortion of the common understanding of what is science would not exist.

(II) The U.S. government and the phenomenon of exceptionally high temperatures and persistent heat at Ground Zero

Fires from shredded office contents in dust covered oxygen starved collapse piles cannot burn hot enough to account for the observed, and via reliable sources documented, phenomenon of exceptionally high temperatures and persistent heat at Ground Zero. It is also unlikely that random collapse piles fires could account for the pattern that the location of hot spots remained constant for weeks.

If you consider some of the sources compiled in Part I (most notably the publication by the U.S. Department of Labor, and the thermal images) it is obvious that the phenomenon of exceptionally high temperatures must have been known to government agencies from the beginning. Ground Zero was a crime scene, and it was also officially declared a crime scene. Unusual phenomena at crime scenes are supposed to be investigated. You would therefore expect that the heat phenomenon would have been thoroughly investigated by the agencies that were responsible for searching Ground Zero for forensic evidence. However, no record of any investigation of the high temperatures/persistent heat phenomenon seems to exist in the public domain, and up to now there exists no statement by any agency of the U.S. government that would provide a conclusive explanation for the phenomenon, or that would at least address this evidence appropriately³⁴⁴.

The only publicly known action that might be related to the high temperatures/persistent heat phenomenon at Ground Zero is that a government agency commissioned a “thermite sparking” study. The study was submitted in December 2002, some months after NIST started their WTC investigation. One of the co-authors of the study has published many articles with T.W. Siewert since the 1980s. T.W. Siewert in turn participated in the NIST WTC investigation with an emphasis on steel. The study taken at its face value is unrelated to the WTC. However, a good part of the study has a study design that fits a feasibility study to answer the question if accidental thermite reactions based on rusted WTC-steel surfaces as one reactant, and based on impacting or molten, aeroplane aluminium as the other reactant, would have been possible on a significant scale on 9-11 in the WTC.

Only after the controlled demolition hypothesis (which explains the Ground Zero phenomenon of exceptionally high temperatures and persistent heat with the use of thermite) was becoming more and more public in 2006 did the government agency NIST issue a statement with respect to the “molten steel” sources as part of their WTC fact sheet “*Answers to Frequently Asked Questions ...*”³⁴⁵. NIST’s statement can be interpreted as a kind of

³⁴⁴ The phenomenon of exceptionally high temperatures and the persistent heat at Ground Zero shows exemplarily that NIST did not perform a conclusive investigation of the WTC collapse. A conclusive investigation would address any available evidence. But NIST does not mention nor address the high temperatures/persistent heat phenomenon in the NIST WTC investigation report. Likewise, the official 9-11 commission report does not bother to mention the heat phenomenon at Ground Zero. (See <http://govinfo.library.unt.edu/911/report/911Report.pdf>. Ground Zero is mentioned in the report only once, section 10/ footnote 13, in respect of the EPA statement about the air quality.)

³⁴⁵ See the following statement by NIST’s spokesperson Newman (**quote**):

official declaration on why the “molten steel” sources (and by implication the general high temperature phenomenon at Ground Zero given that molten steel at Ground Zero would provide an explanation for the phenomenon of exceptionally high temperatures and persistent heat) were not of interest from the perspective of the U.S. government. It was shown above that NIST uses manipulating language, that NIST’s statement has the quality of disinformation, that it is in contradiction to stated goals of the NIST investigation, and that it does not provide any conclusive explanation for the “molten steel” phenomenon.

The article “*The Top September 11 Conspiracy Theories*”, issued September 19, 2006, which is published on a website of the U.S. State Department, and other articles in the section “Identifying Misinformation” on the website of the U.S. State Department, Bureau of International Information Programs, can be considered as additional statements by the U.S. government on the subject. But, conspicuously, the US State Department does not address the U.S. American public; it chooses a website that “*engages international audiences on issues of foreign policy, society and values to help create an environment receptive to U.S. national interests*” to publish these articles.³⁴⁶

“It [the fact sheet] is for the masses who have seen or heard the alternative theory claims and want balance.” Quoted from: “U.S. moves to debunk 'alternative theories' on Sept. 11 attacks”, by J. Dwyer, *The New York Times*”, here copied from <http://www.iht.com/articles/2006/09/01/news/conspiracy.php>, published: September 1, 2006.

That NIST acted in response to the internet publicity of the controlled demolition hypothesis is also noted in some media articles. See, for example, the article by “The Washington Post” (see above) where it is stated: “*But the chatter out there is loud enough for the National Institute of Standards and Technology to post a Web "fact sheet" poking holes in the conspiracy theories and defending its report on the towers.*”

³⁴⁶ Note that the “Bureau of International Information Programs” states on their website that they are allowed “to respond to requests from outside the United States only”. See two **quotes**:

The screenshot shows a Netscape browser window displaying the URL http://usinfo.state.gov/usinfo/about_usinfo.html. The page header includes the USINFO logo and navigation links for Topics, Regions, Resource Tools, and Products. Below the header, the text reads: "State Department's Bureau of International Information Programs (IIP) engages international audiences on issues of foreign policy, society and values to help create an environment receptive to U.S. national interests." and "IIP communicates with foreign opinion makers and other publics through a wide range of print and electronic outreach materials published in English, Arabic, Chinese, French, Persian, Russian, and Spanish. IIP also provides information outreach support to U.S. embassies and consulates in more than 140 countries worldwide."

Quoted from http://usinfo.state.gov/usinfo/about_usinfo.html.

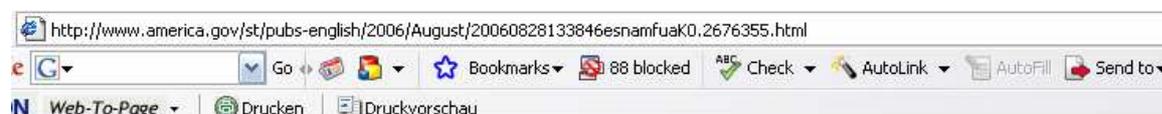
The screenshot shows a Netscape browser window displaying the URL http://usinfo.state.gov/media/misinformation/misinformation_contact_us.html. The page header includes the USINFO logo and navigation links. The main content area is titled "Identifying Misinformation" and contains a "Contact Us" section with the text: "Please send questions or information regarding disinformation, misinformation, urban legends, conspiracy theories, or false rumors to counter-misinformation@state.gov. We will try to respond to all reasonable requests for information." and "Please note that the U.S. laws under which the Bureau of International Information Programs operates allow us to respond to requests from outside the United States only."

Quoted from http://usinfo.state.gov/media/misinformation/misinformation_contact_us.html.

The US State Department website gives no conclusive statement with respect to the heat phenomenon. But they refer³⁴⁷ to an article by the magazine “Popular Mechanics”, to NIST’s WTC investigation report, to NIST’s fact sheet, and explicitly to the above discussed article by Blanchard/Protec/implosionworld.com. The first two references (NIST’s WTC investigation report and Popular Mechanics) do not deal with any phenomenon of exceptionally high temperatures/persistent heat at Ground Zero. By referring and including links to the article by Blanchard/Protec/implosionworld.com, the State Department promotes disinformation with respect to the high temperatures/persistent heat phenomenon. It was shown above that the arguments and the line of reasoning in the Blanchard/Protec article are inconclusive, and that the article has several features typical of disinformation. By referring to NIST’s fact sheet and to the Blanchard/Protec/implosionworld.com article the U.S. State

This might enable the U.S. government to claim that U.S. nationals are not unlawfully tricked when this government website contains deliberately misleading statements and suggestions and links to disinformation articles because it is aimed officially just at “international audiences”.

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19 September 2006

The Top September 11 Conspiracy Theories



The south tower of the World Trade Center collapses. (© AP Images)

Numerous unfounded conspiracy theories about the September 11 attacks continue to circulate, especially on the Internet. Some of the most prevalent myths are:

- 1) The World Trade Center (WTC) twin towers were destroyed by controlled demolitions.

This is how the collapses may have appeared to non-experts, but demolition experts point out many differences:

Demolition professionals always blow the bottom floors of a structure first, but the WTC tower collapses began at the upper levels, where the planes hit the buildings. Non-experts claim that debris seen blowing out of windows was evidence of explosive charges, but

experts identify this as air and light office contents (paper, pulverized concrete, etc.) being forced out of windows as floors collapsed on each other.

Demolition firms had very sensitive seismographs operating at other sites in Manhattan on September 11. None recorded any explosions during the tower collapses.

Clean-up crews found none of the telltale signs of controlled demolitions that would have existed if explosive charges had been used.

Cutting away walls, insulation, plumbing, and electrical conduits to place numerous charges on the towers’ structural columns in advance would not have gone unnoticed.

For more information, see *ImplosionWorld’s* article on the WTC collapses and *Popular Mechanics*, parts 4 and 5.

The

“ImplosionWorld” article is the article by Blanchard/Protec. The other two links are located next to this article and on other pages of the section “Identifying Misinformation” on this State Department website.

Department promotes two disinformation pieces with respect to the high temperatures/persistent heat phenomenon.

(III) The official government account of 9-11 is deceptive

It should not be the case that the U.S. government fails to address evidence from the scene of an immense crime appropriately, and it should not be the case that the U.S. government resorts to disinformation when dealing with evidence from the crime scene WTC.

That the U.S. government fails to address evidence appropriately, that NIST publishes disinformation, that the U.S. State Department promotes disinformation are verifiable matters of fact.

However, why should NIST distribute disinformation about the WTC collapse if this collapse were the result of attacks of “Islamic extremists”? If the collapse of the Twin Towers and WTC 7 were caused merely as a result of attacks of “Islamic extremists” there exists no conceivable reason for the U.S. government to neglect evidence, for NIST to publish disinformation, and for the U.S. State Department to promote disinformation. It is inconsistent with the official government account of 9-11 that the U.S. government fails to address evidence from the crime scene WTC appropriately. It contradicts the official government account of 9-11 that NIST publishes disinformation, that the U.S. State Department promotes disinformation. Based on the named verifiable matters of fact you can conclude that the official U. S. government account of 9-11 is deceptive.

This conclusion is further supported by the fact that the disinformation pieces were written against the background of allegations that 9-11 was a ‘false flag’ operation. If the U.S. government account of 9-11 were correct, they would have reason to support calls for a thorough investigation of the high temperatures/persistent heat phenomenon and all the other observations the controlled demolition hypothesis is based on. If the government account were correct, a thorough investigation had the potential to establish a collapse hypothesis that showed that all the available evidence were explicable as consistent with the official account, it had the potential to end the named allegations. Significantly, the U.S. government does not support any investigation of the heat phenomenon (and of the other observations the controlled demolition hypothesis is based on) but resorts to disinformation, published by the government agency NIST³⁴⁸, and promoted on the website of the U.S. State Department. The U.S. government clearly has the intention to avert thorough investigations of verifiable observations from the crime scene WTC. You can conclude that the U.S. government is well aware that their official account of what happened on 9-11 is deceptive.

You find with good reason a common understanding in Western Societies that mass media should provide objective information. To cite an English schoolbook: *“In order for democracy to work, the electorate has to be able to make informed choices before they vote.”*

³⁴⁹ The U.S. - government agency NIST, the U.S. State Department (which promotes the disinformation pieces from NIST and Blanchard/Protec/implosionworld.com), Associated Press and any others who fabricate, commission, or spread disinformation with respect to 9-11

³⁴⁸ See with respect to the whole fact sheet and NIST’s WTC report for example:

- *“The NIST WTC Investigation--How Real Was The Simulation? A review of NIST NCSTAR 1”*

By Eric Douglas, R.A., nistreview.org, December 2006;

<http://www.journalof911studies.com/volume/200612/NIST-WTC-Investigation.pdf>

- “Responses to NIST’s FAQs” by K. Ryan 9/01/06 (www. http://stj911.org/ryan/NIST_Responses.html)

³⁴⁹ Quoted from “General Studies. An AS and A Level Course Text”, by Victor Watton, Richard Hobsom, David Walton, Second Edition, London 2005, page 187.

consciously undermine the electorate from making informed choices. They deliberately undermine a basic requirement of democratic societies. Moreover, in the case of 9-11 they also undermine an old and basic consensus of civil society, democratic or not, namely that you investigate a crime thoroughly in order to achieve justice.