

**November 21, 2019**

**Richard L. Garwin, 'More from a Ruina-panel  
Member'**

**Citation:**

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<https://digitalarchive.wilsoncenter.org/document/220119>

**Summary:**

Accounts and memories of the 1979 VELA Incident and the Ruina Panel put together by Richard L. Garwin.

**Credits:**

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**Original Language:**

English

**Contents:**

Original Scan

**More from a Ruina-panel Member**

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[www.fas.org/RLG/](http://www.fas.org/RLG/)

search with, e.g., [site:fas.org/RLG/ "neutral particle"]

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Resources for the DeGeer, Garwin, Muller Panel III  
**"The Ruina Panel: History and Findings"**

**VELA Incident Oral History Session**  
Woodrow Wilson International Center for Scholars  
November 22, 2019

I have submitted many pages of testimony to the organizers, requesting that they be distributed by email to all participants. I assume they have been read, and I welcome questions on what I have provided.

Unfortunately, the organizers or perhaps the National Security Archive did not obtain or perhaps even seek declassification of the full Ruina Panel report, nor did they provide unclassified schedules of its meetings, or the dates of delivery of its report to Frank Press. Here I highlight, in context, elements of the material I have submitted for this review. Sections in braces: { } are not my words.

**{October 10:**

- “Given the lack of any corroborating evidence to support the initial satellite indications of a possible nuclear event in the area of South Africa, we remain where we were on September 22.” (*Paper for Office of Southern African Affairs, prepared by Deputy Director Lewis R. Macfarlane, 10/10/1979*)
- Convened by the CIA, an outside panel of three prominent scientists—Harold M. Agnew (former director of Los Alamos National Laboratory), Richard L. Garwin (H- bomb designer, IBM’s Watson Laboratory), and Stephen Lukasik (Chief Scientist at the FCC, former director of DARPA, Chief Scientist at the RAND Corporation)— finds Vela’s signals to be “consistent with detection of a nuclear explosion in the atmosphere.” The panel notes that nighttime testing is unusual and recommends further data collection. (*Memorandum for Files by Ross E. Cowey, 10/10/1979*)

But that day, 10/10/79 I gave a talk at IBM Yorktown Heights. It would be very valuable to know the date and time of this CIA-convened session. Unusually, I can’t find it in my calendar, but have previously referred to it as 09/25/79!

**{ - January 9:**

○ The meeting on the Vela incident by the “mini”-SCC comes to “the consensus ... that we don’t know what happened, and must proceed in policy terms accordingly.” (*Memorandum from Owen & Oplinger to Brzezinski, 1/9/1980*) }

○ With the Ruina panel report completed, Secretary of State Cyrus Vance agrees that it should be made public. He supports sanctions if there is no nuclear settlement with the South African government. (*Memorandum from Locke to Pickering et al, 1/9/1980*) }

Was the Ruina Panel report completed? If so, how could it have used the work of the large NRL group?

**{June 17:** The Defense Intelligence Agency’s assistant vice director for scientific and technical intelligence Jack Varona criticizes the Ruina report as a “white-wash” using “flimsy” evidence and analysis. According to Ruina, the “weight of the evidence pointed towards a nuclear event” and that hydroacoustic data analyzed by the Naval Research Laboratory (NRL), included “signals ‘which were unique to nuclear shots in a maritime environment.’” (*Memorandum from Martin to Hare, 6/17/1980*) [RLG comment: probably a type. Intended “According to Varona,”]}

----- Forwarded by Richard L Garwin/Watson/Contr/IBM on 11/19/2019 03:43 PM -----

**From: Richard L Garwin/Watson/Contr/IBM**

\_11/21/2019\_

More from a Ruina-panel Member-2.doc

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**To:** Charles Kraus <Charles.Kraus@wilsoncenter.org>  
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**Date:** 11/12/2019 08:24 PM  
**Subject:** Garwin "(2-3 paragraph Abstract"

Dear Colleagues,

Rather than send the requested 2-3 paragraphs, I provide two pages, to give participants a head start. Please distribute to all; I hope it is helpful

In September 1979, I had had long and intimate familiarity with nuclear weapons. I spent every summer 1950-1958 at Los Alamos as a consultant to P Division and then T Division, working primarily on new designs of fission and thermonuclear weapons, and on new techniques for detailed diagnostics of nuclear explosions. So I was well acquainted with the "double-humped curve" of brightness vs. time for atmospheric explosions.

From November 1968 to January 1969, I was a member of the USG delegation to the the Geneva "Surprise-Attack Conference" and also served informally as a member of the international session on comprehensive nuclear test ban (with Hans Bethe and others), which had been briefed on the details of the Vela program-- Vela HOTEL ("High altitude") and Vela UNIFORM ("Underground").

Given the data communicated in Vela 747, at the Agnew/Garwin/Lukasik meeting at CIA perhaps on 09/11/25/79, we naturally asked for additional confirmatory data, or data that would negate the finding of a nuclear-explosion source. All should understand that the particular Vela bird saw the entire facing Earth hemisphere and had no ability to determine location within that hemisphere. The location as "South Atlantic" derives from the fact that no other Vela satellite, nor a similar instrumentation package that may have been carried on some other satellite, reported a detection at that same time; the fields of view of these non-Vela-747 detectors precluded a location other than the "South Atlantic." I don't have more detail on the area viewed solely by the one reporting satellite, but the figure in the CIA report provided in the excellent archival material shows the entire region of the South Atlantic Ocean-- not just a small area off South Africa.

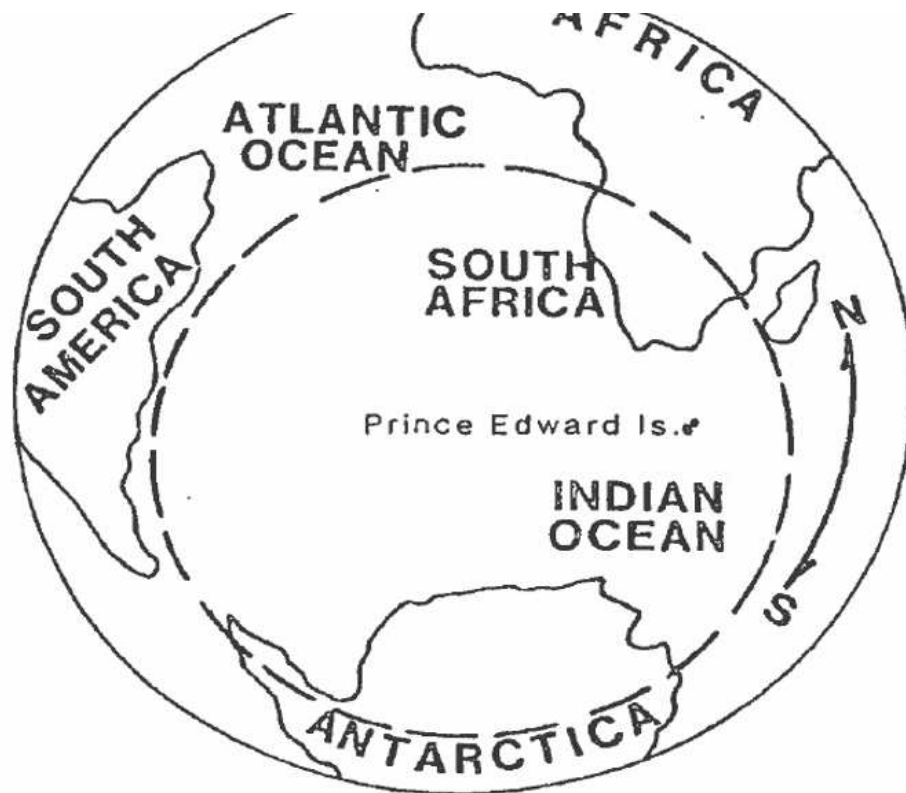


Fig.1. FIELD OF VIEW CONSIDERED FOR THE NUCLEAR EVENT

(From Document 10, LASL "22 September 1979 Event, " 26 November 1979 ITO-79-155)

[Inserted 11/20/19 into presentation]

I told the meeting hosts that "it was too soon to tell" given the absence of information from other sources, but they explained that they had to tell the President something, so **I said that it was too soon to tell but if I had to bet, I would bet two to one in favor.**

My letter of 10/18/79 to Agnew and Lukasik, copied to Keeny, was forwarded by Keeny as I expected. It was not classified by me, but was part of his SECRET letter, accounting for its stamp. It still exists in original form on my computer. I had probably dictated it to a telephone recorder in my IBM office, where it was transcribed by one of my secretaries with initials "fdc".

When we had the **much longer time on the Ruina Panel, and much more time passed to accumulate any confirming evidence, the odds changed for me.** We were able to see many of the "zoo" events, and a particular way of viewing the plots from the two sensors on the Vela satellite (plotting one vs. the other in the "phase plane" showed this "event" to be an outlier. Added to this was the error made by the DIA representative that would have counted the accumulation of any random data-- for or against, as supporting the explosion hypothesis. Only a subset of the Ruina Panel had extensive clearances for SCI-- specifically, technology and data from intelligence satellites.

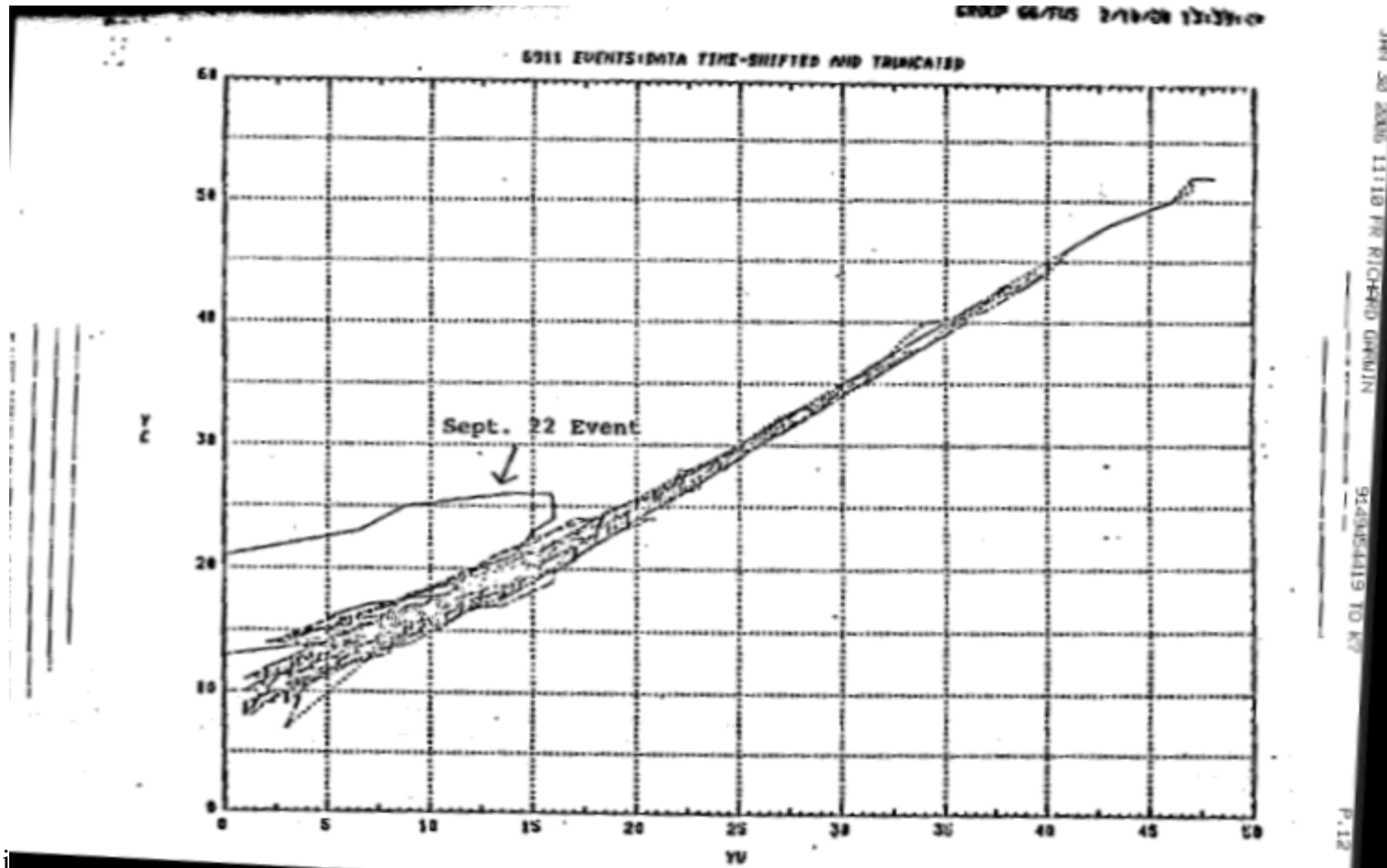
I recall asking a Los Alamos briefer, presenting his interpretation of the Arecibo Traveling Ionospheric Disturbance, to step out into the corridor of the OEOB (now the EEOb), where we sat on the steps so that I could explain to him that the time difference of arrival at the North-pointing detection and the South-pointing detection of the antenna feed was REDUCED (not increase) if the TID came from the South Atlantic rather than from directly South of Arecibo.

**I have no idea whether the "White House" wanted the Ruina Panel to judge that the source of the light pulses was a nuclear explosion, or not. I am absolutely sure that there was no pressure apparent, and that those Ruina Panel members whom I knew well had no motives other than to make the best technical judgment possible. More specifically, like me, they would have resigned rather than slant their findings or analyses.**

**[I repeat: More specifically, like me, they would have resigned rather than slant their findings or analyses.]**

As for my no longer betting 2:1 in favor of the nuclear explosion, **my new betting odds came from the accumulation of evidence for and against, as anticipated from the beginning.**

**The Ruina Panel Report has long been posted at the Garwin Archive, <https://fas.org/rlg/800717-vela.pdf>** Here are some paragraphs which provide background for the judgments of the Report.



In light of the consistency of all known nuclear event data when presented in YC/YV parameter space, the discrepant behavior of the September 22 event assumes major significance. If it is a nuclear event, some source for the increase in YC signal (or decrease in YV signal) must be determined. VELA instrument malfunction has been examined as a possibility but appears highly unlikely. Background changes arising from spurious reflections from the optical detector baffling surfaces has been advanced as a cause; some evidence presented late in our meetings indicates that this possibility should be pursued (it may be testable experimentally) but it is unlikely that such a reflection can account for the discrepancy.

The alternative explanation is that the September 22 event is not of earth origin. Viewed only in terms of YC/YV ratios, the September 22 event more closely resembles the zoo events than it does the known nuclear events. If no other mechanism for the YC/YV discrepancy can be determined, a near-by origin for the event must be considered more likely than an earth-based nuclear origin.

That is still my view, but it is subject to change if other evidence is available.

/ Richard L. Garwin /

----- Forwarded by Richard L Garwin/Watson/Contr/IBM on 11/19/2019 03:55 PM -----

**From:** Richard L Garwin/Watson/Contr/IBM  
**To:** "Cohen, Avner" <avnerc@miis.edu>  
**Cc:** "alanberman@aol.com" <alanberman@aol.com>, Charles Kraus <charles.kraus@wilsoncenter.org>, Christian Ostermann <Christian.Ostermann@wilsoncenter.org>, Pieter Biersteker <Pieter.Biersteker@wilsoncenter.org>, William Burr <wburr@gwu.edu>  
**Date:** 11/17/2019 08:59 PM  
**Subject:** Fw: FW: Invitation to 11/22 Oral History Workshop on the VELA Incident

Dear Avner Cohen and colleagues, PLEASE DISTRIBUTE this EMAIL to all participants.

Thank you. I have read all six items transmitted with this letters.



In doing so, I have made "notes," by gathering excerpts from several of the papers, to which I will refer in my participation during the meeting this Friday. I have enclosed a couple of lines in square brackets-- [ ]. These have been added by me.

As I stated in my previous comment, I really wish that the Ruina Panel had had access to the NRL report, or that I had known about it afterwards.

I found many valuable contributions in the Wright/Geer and Geer/Wright SGS papers.

I had hoped to find in the "On-line Supplement" the details of the hydroacoustic signals, which could be definitive in my experience. But there are no such data-- not the fault of Geer/Wright or of the Science and Global Security Journal.

I point out, however, an analogous "conclusive" calculation of acoustic echoes (from the Dallas Police Department recordings of police microphone signals at the time of the assassination of President John F. Kennedy). I was a member of a the Committee on Ballistic Acoustic of the National Academy of Sciences, Available free at <https://www.nap.edu/catalog/10264/report-of-the-committee-on-ballistic-acoustics> (1982) that demonstrated that the recordings were, in fact, not made from a microphone in Dealey Plaza and did not capture the assassination gun shots.. With several member of the Ramsey Committee, and then with my IBM colleague Ralph Linsker, I responded to a later challenge, [https://fas.org/rlg/RL9b02\\_WithFigNums&Preamble\\_RL6818\\_JFKReply\(+FullPageFigures\).pdf](https://fas.org/rlg/RL9b02_WithFigNums&Preamble_RL6818_JFKReply(+FullPageFigures).pdf) , [https://fas.org/rlg/ThomasComment\\_\\_correspondence1.pdf](https://fas.org/rlg/ThomasComment__correspondence1.pdf) , [https://fas.org/rlg/2005\\_ScienceandJustice454\\_SynchronizationofAcousticEvidence.pdf](https://fas.org/rlg/2005_ScienceandJustice454_SynchronizationofAcousticEvidence.pdf) I cite this not to cast any doubt on the analysis of the NRL group, but to state that the result of the potentially powerful acoustic timing analysis needs to be studied in detail. As stated by Geer/Wright in Footnote 46, *"Only declassification of the NRL report could address this question."*

/ Richard L. Garwin / (On 1/17/19 at 20:55 pm EST)

>>>>>>>>>> "Notes made by RLG on reading Wright/Geer and Geer/Wright:

[Wright/Geer:]

{Advisor Frank Press to analyze the Vela incident. The panel reported its conclusions to the U.S. government in May 1980 and a declassified version became available a few }

["May 1980"??]

{The combination of a surface burst and a large surrounding mass suggests a barge-like shot. Curiously, the panel did not compare the Alert 747 signal with the one from the 22-kt Arcturus test on a barge at Mururoa on 2 July 1967, even though it noted that "the bangmeters on the Vela satellites have been triggered by and have recorded almost all previous nuclear explosions" in the atmosphere. Such a comparison could have provided valuable data on the impact of the barge and water mass just below the explosion on the optical signal. There were also three barge explosions in Polynesia in

1966, but the first launch of advanced Vela satellite pairs (Vela 7 and 8), the first with bhangmeters overlooking the Earth, took place on 28 April 1967, just two months before the last non-disputed near-water explosion on the planet.}

{19. It is worth noting here what the Ruina report did not say, namely that Alert 747 was not the signature of a nuclear explosion. Shortly after the release of the report one of the panel members was quoted as saying that when the panel first convened they thought the chance that it was a nuclear explosion was 4:1 while at the end of their deliberations it was 4:1 against (Eliot Marshall, "Debate continues on the bomb that wasn't," *Science*, 209(1980): 572–573.) Such odds are still quite reasonable.

[Good paper.]

[Geer/Wright:]

{In classifying Alert 747 as a zoo-on, the anecdotal evidence is that the Ruina Panel rejected the opposing explanation put forward by government agencies and/or contractors. Further, the Panel largely dismissed corroborative evidence of a nuclear explosion. This included a 300-page report from the NRL, which contained an analysis of a hydroacoustic signature, the temporal and spatial origins of which were consistent with those of the optical signal.<sup>8</sup> The NRL report remains classified to this date.}

“NRL report submitted June 30, 1980”

{“An amusing incident originated from a U.S. Department of Energy (DOE) funded research installation that examined sheep thyroids from New Zealand (sic)” and “...when visiting the research installation in question, we found the detector used to analyze the sheep thyroids to be completely unshielded, and it was further reported that elevations in counting rates from that detector were not only due to contaminated specimens, but would also be triggered by the packages of passers-by!”<sup>24</sup>}

{This is not correct. Van Middlesworth described his detector as a shielded 5 × 5 NaI(Tl)-crystal with a 1 well for the sample, all shielded by 4 inches of lead. The detector with an empty well showed a count rate of about 0.3 counts per second, which is 3–4 orders of magnitude lower than the expected count rate for an unshielded 5 × 5 crystal. Dr. Panofsky had mistaken a large unshielded sodium iodide detector in the laboratory that alarmed if unexpected radioactivity was brought into the counting room for the detector used to measure thyroids.

Nobel laureate Luis Alvarez, another member of the Ruina Panel, demonstrated a similar lack of appreciation for all possible corroborative evidence when he wrote about the work of the Ruina Panel in his 1987 autobiography: “In our DIA (Defense Intelligence Agency) briefings we were shown, and quickly discarded, confirming evidence from a wild assemblage of sensors: radioactive Australian sheep thyroids, radio telescopic ionospheric wind analyses, recording from the Navy’s sonic submarine-detection arrays that supposedly precisely located the blast from patterns of sound reflected from bays and promontories on the coast of Antarctica.”<sup>25</sup>

A declassified version of the Ruina report was published on 17 July 1980. Regarding Van Middlesworth’s detections and the NRL analyses, the report concluded:

“The search for nuclear debris and for geophysical evidence that might support the hypothesis that a nuclear explosion was the source of the September 22 event has so far only produced data that is ambiguous and noisy. At this date, there is no persuasive evidence to corroborate the occurrence of a nuclear explosion on September

{ 22.” Following the release of the report, VanMiddlesworth repeated his measurements in August 1980 to confirm that there were no long-lived signals at the iodine-131 energies (see [Figure 1](#)). In a letter received on 25 September 1980, Van-Middlesworth wrote about his analyses and concerns to the NRL Research Director, Dr. Alan Berman, someone who had vociferously protested the Ruina Panel’s ignorance of....}

{ A declassified version of the Ruina report was published on 17 July 1980. Regarding Van Middlesworth’s detections and the NRL analyses, the report concluded:


“The search for nuclear debris and for geophysical evidence that might support the hypothesis that a nuclear explosion was the source of the September 22 event has so far only produced data that is ambiguous and noisy. **At this date**, there is no persuasive evidence to corroborate the occurrence of a nuclear explosion on September

22.” } [ Presumably, "at this date" refers to when the words were written (maybe January, 1980??)

{ The several-hundred-page report was forwarded to the White House on 30 June

1980. The report remains classified and is only superficially discussed in the numerous publications on the Vela signal. Several specific findings have been summarized, however, in a declassified letter from the NRL Research Director (NRLRD), Alan Berman, to the Executive Office of the President, Office of Science and Technology Policy (OSTP) on 11 December 1980 (hereafter referred to as NRLRD- 80).<sup>36</sup> **This letter was sent after a presentation by NRL on 3 December 1980 to the Ruina Panel, and appeared to be a follow-up to what the Director perceived as misunderstandings and/or confusion among the Panel members about the NRL’s findings.** }

**I attended the Ruina Panel session on December 4, 1980 but not on December 3 with Dr. Berman.**

November	
30	SU
1	MO YKT; National car to be returned Phil. Airport 12/03;
2	TU Valley Forge, Pa, Tech. Panel; c/o Bill Myers (215) 265-9361; stay Stouffers's 337-1800; MLA out
3	WE Valley Forge, Pa, Tech. Panel; PHIL-WASH 1605-1650 AL 911; stay Arlington Hyatt House; WASH; 0930 John Marcum ad hoc panel--X;
4	TH WASH; 0900-1730 ad hoc panel, Sept. 22nd Event, OEOB, room 248; (John Marcum); 1600 Les Dirks; 1700 Bill Perry; 1800-1930 CFR Yankelovich; 
5	FR WASH, JASON stay AHH; 1800 JASON reception, International Club;
6	SA WASH, JASON; stay AHH;

{spreading for the decrease of the signal energy with distance is appropriate.<sup>56</sup> Yet, the dismissal of the hydroacoustic evidence by the Ruina Panel starkly contrasts with that of the NRL experts.}

{These include i) detections on all 3 hydrophones within travel time constraints to 16 L.-E. DE GEER AND C. M. WRIGHT the area of the Vela satellite coverage, ii) statistically significant cross-correlation for all hydrophone pairs, iii) duration of 8–32 seconds, iv) a consistent “line structure” (probably meaning the frequency spectrum), and v) SNR > 22 dB in the 12.5 } 1.5 Hz frequency band on all 3 hydrophones. }

[Reflected hydroacoustic signal can be more intense than the direct path-- e.g. portions of the elliptical reflector...]

### *{Coupling of Alert 747 acoustic energy into the ocean*

The final issue not covered in NRLRD-80, and perhaps the most important in the context of a possible nuclear test, is the mechanism by which the explosion coupled acoustic energy into the SOFAR channel. Based...} [Cf RLG's comments in his Munk memorial talk of 10/17/2019]

{explosion.<sup>98</sup>

\_11/21/2019\_

More from a Ruina-panel Member-2.doc

Another possible corroborative observation was a traveling ionospheric disturbance detected at the Arecibo radio telescope in Puerto Rico, which had the right velocity and originated from the right direction, and which would otherwise only have a 1-in-50 chance of occurring randomly.<sup>99</sup> The responsible scientists never claimed it to be unambiguously associated with the Vela signal, and the NRL also dismissed the idea that the two were related.<sup>100</sup>

{The local time at the island group is UTC+3 hours and most staff should have been asleep at 3:53. This is 2 hours and 24 minutes before sunrise and for someone awake potential explosion effects could presumably have been taken for lightning and thunder given there was heavy storm activity in the vicinity.<sup>104</sup>}

{46. It would be interesting to know if the reflected and direct arrivals at Ascension were detected on the same three hydrophones, and/or whether the direct arrivals had sufficient SNR to provide a bearing and travel path range. Only declassification of the NRL report could address this question.}

[Note: Kamegai, M., and White, J.W. *A study of near-surface and underwater explosions by computer simulations*. United States: N. p., 1994. Web. doi:10.2172/10137363. <https://www.osti.gov/servlets/purl/10137363> ]

**[RLG added 11/20/19: This paper demonstrates downward-directed kinetic energy in water to be a constant fraction of the explosive yield, at a height/depth that scales as the cube-root of the yield. At water surface, this fraction is about 1.5%.]**

<<<<<<<<<<<<<<< End of "Notes" by RLG on reading Wright/Geer and Geer/Wright.

----- Forwarded by Richard L Garwin/Watson/Contr/IBM on 11/19/2019 04:23 PM -----

**From:** Richard L Garwin/Watson/Contr/IBM  
**To:** Charles Kraus <Charles.Kraus@wilsoncenter.org>  
**Cc:** "Cohen, Avner" <avnerc@miis.edu>, Christian Ostermann <Christian.Ostermann@wilsoncenter.org>, Pieter Biersteker <Pieter.Biersteker@wilsoncenter.org>, "wburr@gwu.edu" <wburr@gwu.edu>  
**Date:** 11/15/2019 09:56 AM  
**Subject:** Berman account of 11/11/2019.

Dear Charles Kraus,

Please distribute this communication to those who will participate in the meeting on 11/22/19.

\_11/21/2019\_

More from a Ruina-panel Member-2.doc

The Berman statement of 11/11/2019 is truly a very interesting account-- just the sort of work I was calling for in my Letter of 10/18/1879 to Harold Agnew and Steve Lukasik, distributed within the USG the next day by Spurgeon Keeny of ACDA.

According to the Chronology, the NRL report was sent to OSTP June 30, 1980. That same Chronology indicates that the Ruina Panel Report was complete by January 7, 1980, but I have no independent data on that and would like to learn when the Report was actually submitted to Frank Press.

The Ruina Panel had some early input from the Berman team and would have loved to have had the data from a 300-page technical report. I have known Alan Berman since about 1953 and have high regard for him. I haven't seen him in decades.

However, when he writes, "In my view, the Ruina panel did not understand how underwater sound propagates," he paints with too broad a brush. I can't now vouch for Jack Ruina, but I am certain of my own long experience in that field. I chaired the Antisubmarine Warfare Panel of the President's Science Advisory Committee (PSAC) that met two days each month from 1957 to 1973; and in 1977, with Walter Munk and Carl Wunsch, I wrote a JASON report that launched the field of Ocean Acoustic Tomography, relying on the transoceanic propagation of sound (<https://fas.org/rlg/munk.pdf> pp. 7-8).

Perhaps Dr. Berman is correct that the White House limited access to the Berman report for political reasons. The members of the Ruina Panel would have welcomed the data and analysis to which Dr. Berman refers. Perhaps it was not ready by the time the Ruina Panel report was submitted; I don't know, and it would be valuable to establish this detailed timeline.

IF I could review the 1980 NRL report now, I might well recognize the VELA 747 event as a nuclear explosion, but can't do so on the basis of a narrative.

Although government employees and those at the U.S. National Laboratories may have continuing access to intelligence data or other classified material, those who have been brought in on an ad hoc panel generally lose that "need-to-know" access when their report is submitted. And we may have many other interesting and important matters in our outside work and family. In my own case, it is now a matter of record, for instance, that I was much involved with the National Reconnaissance Office-- NRO-- which activity was recognized in the year 2000 by being named one of ten Founders of National Reconnaissance (and am now one of two surviving Founders. At any time since 1980, I would have welcomed a USG invitation to review the Berman-team report.

/ Richard L. Garwin / November 21, 2019.