THE SEPTEMBER 22, 1979 MYSTERY FLASH:
DID SOUTH AFRICA DETONATE A NUCLEAR BOMB?

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This report was produced in cooperation with Congressman John Conyers, the Congressional Black Caucus Foundation (CBCF), and the World Campaign Against Military and Nuclear Collaboration with South Africa. The CBCF seeks to inform the American populace about issues critical to Black America. The World Campaign seeks to promote the widest awareness by world public opinion of the grave and increasing threat to international peace and security created by the system of apartheid in South Africa, and campaigns to end all forms of military, nuclear, and security collaboration with the South African regime.

The Washington Office on Africa Educational Fund is the educational and research arm of the Washington Office on Africa. It seeks to provide information to the American public about U.S. support for the South African system of apartheid.
At 3:00 AM (South African time) on September 22, 1979, a U.S. Air Force intelligence satellite, the Vela, recorded a double flash of light emanating from the South Atlantic-Indian Ocean area. Such a double flash can be the signature characteristic of a nuclear explosion. This important news did not become known until one month later when it was leaked to ABC correspondent John Scali. Investigations subsequently began, both inside and outside the U.S. government, to verify whether or not there had been a nuclear explosion, and, if so, who triggered it.

Nearly 500 pages of previously unreleased documents from the U.S. Naval Research Laboratory (NRL) obtained by the Washington Office on Africa through the Freedom of Information Act (FOIA), indicate the NRL's firm conclusion that a nuclear explosion had, indeed, occurred. These documents provide data from extensive tests conducted by the NRL and other information that substantiate these claims. Included in these data are results from measurements, never before made known to the public, showing significantly high levels of radioactivity in the thyroids of Australian sheep soon after the September 22 flash. NRL and National Oceanic and Atmospheric Administration meteorological data and radiation testing indicate that wind and weather currents could have taken fallout from a nuclear test on September 22, 1979 in the South Atlantic to the area in Australia where the sheep were located.

The Defense Intelligence Agency (DIA) and the Los Alamos Nuclear Laboratory, as well as individuals in the Department of Energy and the Department of State, joined the NRL in its determination that a nuclear bomb had been detonated, according to press reports. The Central Intelligence Agency (CIA) reported that the nuclear bomb was exploded in a joint South African-Israeli test.

Despite the conclusions of the NRL, DIA, CIA, and others that a nuclear blast had occurred, a scientific panel appointed by the Carter Administration White House reached the conclusion that the evidence was inconclusive. The panel, however, did not do any independent investigation, did not receive all
pertinent information before it released its report, and discounted other data brought to its attention which would have led it to a different conclusion. Political motivations may have played an important role in releasing the White House report at the same time as the release of the DIA report, which had independently come to the conclusion that a nuclear bomb was exploded.

The following report is intended to raise to public attention once again the evidence pointing to the occurrence of a nuclear explosion off the South African coast in 1979 and its implications for U.S. policy. The report will summarize both new and old information that a nuclear explosion did occur, including the new data concerning the Australian sheep. This report is not intended to independently pass judgement on the scientific data, nor does it enter the scientific debate as to which data and tests are valid and which are not. It does, however, present the evidence as put forth by the NRL, as explained in the obtained FOIA documents, and places it in its political context. Because the NRL's extensive report to the White House was not released under the FOIA and because other documents were withheld, the documentation presented herein is unfortunately sometimes sketchy. The report raises numerous unanswered questions, including why the NRL report, the result of the most extensive study by any agency in the U.S. government on this matter, was summarily dismissed by the White House panel and why the White House's Office of Science and Technology Policy did not consider new information as it became available and revise its report.

The Carter Administration's political equivocation on this historic event, coupled with the Reagan Administration's subsequent allowance of an increase in nuclear aid to South Africa [see appendix A], has serious implications for international peace and security, and underscores the need for the executive and legislative branches to re-open the case. The report also underscores the need to halt all U.S. nuclear collaboration with South Africa immediately. Nuclear weapons in the hands of the South African government-- known the world over for its racist system of apartheid-- are a dangerous threat to the African continent and the entire world.
SOUTH AFRICA'S NUCLEAR BOMB

Suspicion that South Africa detonated a nuclear bomb is supported not only by technical and scientific data, but also by the firm knowledge that Pretoria has acquired an advanced capability to make and deliver nuclear weapons. It acquired this capability through several decades of nuclear assistance from the West, most notably, the United States, France, and West Germany. [See appendix B] U.S. assistance to South Africa's nuclear program has been so important that A.I. Roux, President of South Africa's Atomic Energy Board, noted in 1976: "We can ascribe our degree of advancement today in large measure to the training and assistance so willingly provided by the United States."¹ South African government officials themselves have repeatedly alluded to this capability [see appendix C], although they have not admitted to testing a nuclear weapon.

South Africa possesses a nuclear research reactor, Safari (obtained from the U.S.), a nuclear power reactor, Koeberg (obtained from France with U.S. assistance), a pilot uranium enrichment plant, Valindaba (obtained from West Germany with U.S. assistance), and is currently building a commercial uranium enrichment plant. Both the Safari and Koeberg reactors produce plutonium as a byproduct. Furthermore, the Safari reactor has run on weapons-grade uranium. While these two reactors are under International Atomic Energy Agency (IAEA) safeguards, many observers have noted the laxness of IAEA oversight, making diversion of materials for nuclear weapons possible if a government so chooses. Furthermore, South Africa has refused to sign the Nuclear Non-Proliferation Treaty or to submit its enrichment plant to any safeguards. Pretoria has already indicated that the Valindaba plant can enrich uranium to weapons-grade levels. If South Africa detonated a nuclear bomb in 1979, it is possible that it would have received the fissionable materials from outside the country, however, because some of these inside sources were not well developed at that time.²

South Africa also has the capacity to deliver nuclear weapons. It can do
so via its Mirage III jets (obtained from the French), its Bucaneer or Canberra bombers (obtained from the British), its Israeli-designed Jericho missiles, or its 155 mm howitzer cannons (obtained from the U.S.).

Suspicion that Pretoria has the nuclear bomb was raised in the summer of 1977. On August 6, 1977, the Soviet government told the Carter Administration that photographs obtained from its Cosmos satellite indicated that South Africa was preparing to detonate a nuclear device in the Kalahari Desert. President Carter ordered data to be collected from the U.S. Big Bird intelligence satellite and subsequently confirmed the Soviet finding. British, French, and West German intelligence also confirmed that South Africa was preparing a nuclear weapons test. The West told Pretoria unequivocally not to explode the bomb, and the government apparently agreed. The South Africans subsequently denied a nuclear test was imminent. Former South African Ambassador to the U.S. Donald Sole, however, added speculation when he told Christian Science Monitor reporter David K. Willis in 1981: "Well, we were going to test something, but not a weapon," sounding strangely similar to the Indian government's claim in 1974 that the nuclear bomb it detonated was "peaceful." The 1977 Kalahari incident indicated that Pretoria had completed constructing its nuclear weapon and was now ready to test it.

THE EVIDENCE THAT A NUCLEAR TEST OCCURRED

1) Vela Satellite Reading

On September 22, 1979, the U.S. Air Force Vela satellite detected a double flash of light, which can be the signal of a nuclear explosion, in the South Atlantic-Indian Ocean area. The Vela information suggested to some analysts that a nuclear explosion of two to four kilotons was involved.

Shortly after the Vela sighting, President Jimmy Carter's Science Adviser, Dr. Frank Press, brought together a distinguished panel of nine scientists, chaired by Dr. Jack Ruina of the Massachusetts Institute of Technology, to evaluate the event. The White House panel tried to find alternative explanations for the Vela reading. What they could not
discount was the fact that the Vela, designed specifically to detect nuclear weapons
tests, had a perfect record to that point, having sighted 41 previous nuclear explosions in
its fifteen years of operation. The panel also discovered that the satellite had been
calibrated just one week earlier.⁵

Alternative theories were raised that the double flash may have recorded a superbolt
of lightning or a "zoo event," a phenomenon that cannot be explained, perhaps caused by
the impact of a small meteroid hitting the satellite. The White House panel itself
dismissed the superbolt theory, noting that in previous cases, superbolt sightings had
caused only one flash of light, not the two which are characteristic of a nuclear explosion.

The White House panel was most receptive to the "zoo" theory. Its report stated:
"Although we cannot rule out the possibility that this signal was of nuclear origin, the
panel considers it more likely that the signal was one of the zoo events, possibly a
consequence of the impact of a small meteroid on the satellite."⁶ The panel reached this
conclusion after noting that the September 22 flash was more powerful than previous
nuclear flashes, suggesting that the flash occurred "close to the satellite rather than near
the surface of the earth."⁷

The "zoo event" explanation—or what is essentially the lack of an explanation—may
have been convenient for those in the White House who were searching for a political
alternative to the nuclear explanation. It was a conclusion that disgruntled many
scientists and intelligence officials examining the evidence, however. One Vela expert
noted that when suddenly an alternative explanation for the Vela reading was needed, "the
zoo animals came marching out of the woodwork."⁸ A State Department arms control
expert acknowledged possible political motivations for the "zoo" theory: "As long as there
is any data to suggest inconclusive findings," he said, "as long as the 'smoking gun' is
missing, the administration doesn't have to come clean on this one, and it's doubtful that
they will."⁹[Emphasis added]
Another State Department official said: "Look, the Vela satellite picked up a signature like this 41 times before. In every one of those 41 instances, there was never any question about the fact that a nuclear test had taken place. Each of those 41 was undeniably a nuclear explosion. This was, too."\(^{10}\) Scientists at the Los Alamos Laboratory called the Vela double flash the "unmistakable" signature of a nuclear explosion.\(^{11}\) A U.S. intelligence official also dismissed the meteor theory: "That is so impossible as to be indescribable. You're talking about something that might happen once every 100 million years. There is absolutely no evidence of it..."\(^{12}\)

In fact, the White House panel cast doubt on the credibility of its own "zoo" theory when it noted that the Vela had recorded other "zoo events" several hundred times before and that some of them had "characteristics associated with signals from nuclear explosions, although they could be distinguished clearly from nuclear explosions signals upon examination of their complete time histories." [emphasis added]\(^{13}\)

2) Hydroacoustic and Acoustic Data

Hydroacoustic data compiled by NRL provided firm corroborating evidence that a nuclear explosion did occur. Dr. Alan Berman, Director of Research for NRL, told John Fialka of the Washington Star that "a hydroacoustic signal was detected which had characteristics that were similar to those received from known nuclear detonations. [sic]"\(^{14}\)

The White House report dismissed the NRL's hydroacoustic findings in a few lines, arguing that "this entire study is still too incomplete to apply to the event because no determination of background signal amplitude and occurrence have been furnished to resolve the question of ambiguity in signal identification and source locations."\(^{15}\)

Dr. Berman responded by noting that the hydroacoustic signal occurred at the right time and came from the right direction, that it was the strongest hydroacoustic pulse he had ever studied, and that its "signature" was fully consistent with those following overt nuclear tests in the Pacific Ocean.\(^{16}\)
"It's strong enough to make the case in its own right," Berman told the *Washington Star.*

The White House panel also dismissed other acoustic data. The *Washington Post* had reported that "the Air Force Technical Applications Center and the CIA reported finding acoustic evidence from listening posts in widely separated parts of the world that seems to confirm an explosion." This conclusion, however, was withdrawn after "further study," and the earlier evidence was explained away as being "commonplace random background noise." The White House panel concluded that a low-yield nuclear explosion would not produce such a signal and that "the acoustic data available are considered unrelated to this event."

3) **Fallout**

It has always been purported that the "smoking gun" for the nuclear explosion theory, such as radioactive fallout, was missing. An initial report by a health physics laboratory in New Zealand with evidence of fallout was disputed by New Zealand's National Radiation Laboratory. The White House panel itself noted, however, that such negative findings "do not provide conclusive evidence that no nuclear explosion occurred." Significantly, the U.S. did not begin to search for radioactivity until over three weeks after the Vela reading, more than enough time for the fallout to be dissipated by rainwater. The NRL's own research indicated that, if it was a bomb, it was exploded near the ocean surface, eliminating any possibility that fallout would be found in the upper atmosphere.

Some speculation has been raised that the explosion was that of a neutron bomb. "We have no evidence that it was a neutron bomb but the possibility has been discussed more than once," said a source close to the White House Office of Science and Technology Policy. "It's one of the few things that could explain why we've never found any radioactive fallout from the explosion." A nuclear weapons scientist at the Los Alamos Scientific Laboratory agreed, saying: "An explanation of a neutron weapon would certainly explain the low yield of that event."
Most significantly, however, the FOIA documents now reveal new evidence of what could have been radioactive fallout from a nuclear bomb explosion on September 22. This fallout was discovered by Dr. L. Van Middlesworth of the Department of Physiology and Biophysics, College of Medicine at the University of Tennessee. Dr. Van Middlesworth wrote to Dr. Berman at the NRL on September 25, 1980 that he discovered radiation in sheep thyroids he had examined in Australia soon after the September 22, 1979 blast. Dr. Van Middlesworth explained that he had routinely examined cattle and sheep tissues for such elements for 25 years, and that his sample of sheep thyroids for November 12 and 13, 1979, he believed, contained unusual levels of radioactive iodine, which his measurements set at six times the standard deviation above the average. He said that this was the first time he had ever detected iodine in the thyroids of sheep.

An analysis of this data by the NRL suggested that the detected levels of iodine in the sheep samples were "unlikely to be due to statistical fluctuations, since the net counts are five times the standard deviation," (slightly altered from Van Middlesworth's original conclusion of six times) and that, aside from iodine, there were no other known sources of radiation which would have caused this effect in that environment. The source of the radioactive iodine was uncertain, but it was thought that, since the sheep were in rural areas, the source probably was rainwater falling on the grazing material which the sheep ingested.

NRL and National Oceanic and Atmospheric Administration (NOAA) meteorological studies confirmed that wind and weather patterns could have carried radioactive fallout from the area of the flash and dropped it on that area of Australia (Victoria and Tasmanian provinces) on September 26 and 27, 1979. An NRL-NOAA team established the trajectory for the clouds which may have been radioactive. [see appendix D]

In a November 3, 1980 letter to Dr. John Marcum of the White House's Office of Science and Technology Policy, Dr. Berman wrote:
"Prior to the examination of samples obtained from animals which were slaughtered in Melbourne, Australia, in late October and early November of 1979, no evidence of $^{131}$I [a fission product emitting gamma radiation] was ever seen in Australian sheep thyroids ....Subsequently, no evidence of $^{131}$I has ever been detected....[This presents] a positive case for the proposition that Australian sheep ingested the fission product $^{131}$I during the month of October, 1979."$^{29}$

After explaining this new data, Berman wrote, "As you know, NRL believes that there are significant indications that a nuclear detonation may have taken place on 22 September 1979, in the vicinity of the Prince Edward and Marion Islands..."$^{30}$

Dr. Marcum apparently requested that the Department of Energy (DOE) critique Dr. Berman's analysis. In a December 3, 1980 reply to Marcum by Dr. Julio Torres, Director of the DOE Office of International Security Affairs, it was clear that DOE's Environmental Measurements laboratory had come to different conclusions about the data. The DOE argued that the amount of iodine in the sheep thyroids was only one standard deviation from the norm, not the five standard deviations noted by the NRL.$^{31}$

By February 1981, however, the NRL and the DOE had apparently reached a compromise and agreed that the deviation was at a level of 3.1 (the statistics were adjusted and the DOE scientists admitted to a misunderstanding). An NRL scientist subsequently concluded that "a signal of this magnitude is unfortunately in a middle ground where it cannot be dismissed as a frequent occurrence nor can it be claimed with certainty to be different from background."$^{32}$ Although this resolution of the problem appeared to diminish Dr. Van Middleworth's findings, the argument between the two agencies seemed to center on differences in statistical methodology, with the most sceptical (DOE) ultimately admitting that the amount of iodine in the sheep thyroids was
more than three times the standard deviation above the average. No alternative explanation was noted for this excess in iodine levels.

4) Ionospheric Disturbances and Radar Detections

The White House panel discounted ionospheric evidence provided by the Arecibo Laboratory in Puerto Rico and the Los Alamos Laboratory in New Mexico, and did not consider both new ionospheric evidence provided by NRL and radar detections by the U.S. Air Force:

a) A sophisticated radio observatory at Arecibo, Puerto Rico saw an unusual ripple in the ionosphere (a "traveling ionospheric disturbance," or TID) that some scientists suspected could have been caused by a nuclear blast. Arecibo's radio telescope-- known to be the most sensitive in the world-- showed that the ripple was, significantly, moving from South to North, placing it in the same general area as the flash detected by the Vela.33

The White House panel dismissed the Arecibo report, pointing out that the Arecibo laboratory, just opened, had too little previous experience to analyse the frequency of such occurences, that there was an uncertainty about the velocity of the signal, and that a tropical storm near Arecibo could have generated an ionospheric disturbance.34 The FOIA documents indicate that NRL's scientists also discounted the Arecibo findings.35

James Walker and Lewis Duncan, the Los Alamos researchers who had originally made the discovery at Arecibo, however, held firm to the existence of the TID and to its calculated velocity in discussions with Dr. John Goodman, head of the NRL investigative team, although they could not be certain of its relationship to the Vela event. They argued subsequently that most scientists did not understand the technical sophistication of the Arecibo incoherent scatter facility and the technique of detection they had developed, which had only been in use for a few days before the discovery of the event.36 A Congressional aide pointed out to the Washington Post that the simultaneous occurence of an ionospheric ripple and double flash "is an awfully strange coincidence."37
Despite the fact that NRL discounted Arecibo's discovery, it did conduct its own independent ionospheric tests. The FOIA documents indicate that a separate test at Marion Island, owned by South Africa, 1,500 miles off its southern coast, provided evidence of a possible nuclear test. A confidential July 23, 1980 memo from Dr. Goodman to Dr. Berman reveals that "some rather striking anomaly is in evidence in the Marion Island record" that extended from 0045 UT to about 0230 UT [universal time] on September 22. Dr. Goodman considered this "oscillation" to be natural since such oscillations often occur after midnight in the upper ionosphere. However, he did not consider natural what he described as a "bite-out" or a short empty space in the recorded signal tracings. [see appendix] He explained that "it is known that a ground level nuclear burst will produce a shock which will propagate through the ionosphere, elevating the temperature and changing the chemical reaction rates... A 1 kiloton burst would produce a very slight increase in the free electron loss rate... thus producing a slight hole [in the signal tracings.]." The FOIA documents indicate that the results were ambiguous, yet no other explanation was evident.

b) Early warning radar antennas operated by the U.S. Air Force picked up signals on September 22 of what some analysts suspected was a nuclear test. One source told the Washington Post that it was "a very tenuous piece of data," except for the fact that the radar echoes were picked up at the same time as when the Vela saw the double flash. This was not mentioned in the White House report.

OTHER AGENCIES AGREE

The NRL was not alone in determining that a nuclear explosion occurred. Other agencies concurred and some even pointed out who did it. The Washington Post reported that DOE and Los Alamos scientists "need no convincing" that a bomb was exploded and "question why there should be such equivocating" by the Carter Administration. The
Defense Intelligence Agency (DIA) also concluded that a nuclear bomb was tested. A Pentagon source told the Wall Street Journal: "We are statistically certain" that a nuclear explosion caused the Vela reading.  

The CIA told members of Congress in January 1980 that a task force of South African warships was conducting a secret exercise at sea that very night at the same latitude and longitude as the explosion. A subsequent June 1980 secret CIA report to the National Security Council said the explosion was probably a tactical two- or three-kiloton weapon detonated by Israel and South Africa (and possibly Taiwan). A State Department official agreed, telling the Washington Post: "It basically comes down to a choice between South Africa and Israel or both." Furthermore, a U.S. Navy official confided to journalist Dale Van Atta that two U.S. spy planes had tried to approach the nuclear test area at the time but were turned away by the South Africans and had to land secretly in Australia. This new information not only implicates the the South Africans but also suggests that U.S. military officials may have known of the planned test in advance.

It is significant that these voices from the scientific and intelligence communities did not bear on the White House report. This was, in part, because some of the evidence (such as the iodine found in the sheep thyroids) was not yet known when the report was released and, in part, because some of the evidence (such as that collected by the CIA) was, intriguingly, not shared with the panel.

The explanation, however, must also rest with the White House. For example, the White House report was completed in late November 1979, but its release was delayed and a censored version was not released until July 15, 1980— one day after the release of the DIA report to the White House corroborating the accuracy of the Vela sighting as a nuclear explosion. The preceding six months might have been used productively to garner new information; however, the simultaneous release of the report with the DIA report was either a grand coincidence or was designed to cast doubt upon the
DIA's findings. Columnists Rowland Evans and Robert Novak noted that the DIA report "was put under a tight 'secret' seal after it was read by Carter White House aides." The timing was doubly suspect inasmuch as the NRL report had been sent to the White House on June 30, but there had been no acknowledgement of its substantive findings, some of which may have altered the findings of the White House panel. According to an NRL internal memorandum, John Fialka of the Washington Star noted to Dr. Berman that "it was his understanding that the White House has put our report in a safe and is ignoring it." When the White House report was released, it stated that the "NRL has not yet completed its task but has briefed the panel at its third meeting on its findings to date." Indeed, the FOIA documents reveal that Fialka of the Washington Star asked Dr. Berman on August 7, 1980, "how come the White House lied to us when they said that you had only done a very preliminary study?" Berman stated in an internal memorandum, "I told him that the White House was entitled to their perception of the facts and that it was rather unfortunate that they described our report as a preliminary study." Moreover, nine days after the release of the White House report, the confirming Marion Island ionospheric data was sent to the White House, but again, there was no subsequent public admission of its importance. Then again, when the sheep thyroid data was sent to the White House, there was no acknowledgement of its value to this investigation.

Others seem to concur that the Carter White House equivocated. One scientist who believed there was a nuclear explosion told Science magazine: "The crux of the matter is that the White House is afraid that if this [Vela report] is true, its nuclear nonproliferation policy would be shot to hell. So they said, let's convene a panel and ask them to find a technically feasible explanation other than this, because we don't want to have to face it." Columnists Evans and Novak noted: "Specialists in the Carter
administration were aghast at this kiss-off of what in fact has created an agonizing dilemma for the United States and a dangerous game for the world: anonymous weapons testing." And, as noted above, DOE and Los Alamos scientists questioned "why there should be such equivocating" by the administration.

The FOIA documents indicate that Berman himself was properly circumspect. When asked by Fialka about the discrepancy between the White House and NRL reports, he replied: "I have no desire to get into a urinating contest with the White House." Science magazine noted, however, that Berman was clearly irritated at the White House panel for summarily dismissing his extensive study. The NRL's study was the most extensive conducted in the U.S. government, involving seventy-five staff people. In contrast, Berman noted that the White House panel "undertook no study of its own. They listened to presentations. They heard various opinions and came to their own."

**WHY THE EQUIVOCATION?**

We can only speculate as to the possible reasons for the White House actions in this matter. The following are some possibilities:

First, by casting doubt that an explosion had taken place, the Carter Administration did not have to point fingers at who exploded the bomb. Clearly, some in the Carter Administration did not want even the information on the Vela reading to reach the public, as evidenced by the fact that it took an entire month before the news was leaked to ABC News. Perhaps one reason the administration did not want to release the Vela information was because a South African government delegation was in Washington at the time of the flash, ironically to discuss the Antarctica Treaty. The Treaty prohibits "military activities, including...the testing of military weapons" or "nuclear explosives" in Antarctica. The flash emanated from Antarctica or very near it.

Pointing out that South Africa and/or Israel possessed and had tested a nuclear bomb would have presented significant foreign policy trouble for the
Carter Administration. If it became public that Israel had the bomb the administration might have been pressured to cut off U.S. military aid there (present law would require it). President Carter would have viewed this as domestically and internationally damaging to his Middle East policy. If it became public in 1979-80 that Israel had exploded a nuclear device, it would have probably also have destroyed the carefully produced Camp David Accord, the administration's most significant foreign policy achievement. Furthermore, the administration did not need any new complications in garnering Jewish votes during the upcoming Democratic Party primary campaign against Senator Edward Kennedy.

The detonation of a South African nuclear bomb also would have raised difficult problems for Carter. At the time, the U.S was deeply involved in fashioning the Lancaster House agreement that would transform minority-ruled Rhodesia into independent Zimbabwe. By 1979, the Carter Administration had softened its anti-apartheid rhetoric, in part to win Pretoria's help in pressuring Rhodesia's Ian Smith to settle. The Carter Administration may have believed that a major U.S.-South Africa confrontation over Pretoria's nuclear weapons program would have scuttled the chances for a successful Zimbabwe independence settlement-- another important foreign policy victory the administration needed as it headed into the November 1980 elections.

One State Department official acknowledged: "It would be a major turning point in our relations with South Africa and Israel if we determined conclusively that either had tested a nuclear bomb. It makes me terribly nervous just to think about it." Naturally, in the midst of the Iranian hostage crisis, President Carter would have shied away from any additional foreign policy crises. Proof of a nuclear weapons test would have shown the gaping holes in U.S. nuclear non-proliferation policy and would have exposed several decades of western complicity in providing South Africa and Israel with the goods and technology to make their own nuclear weapons. Discovery of two new members of the Nuclear Club-- in two of the worst hot spots in the
world—would have certainly increased international tensions and would have had serious implications for the U.S. Yet, refusing to face the reality of new nuclear weapons–possessing states poses even more dangerous implications.

Some observers have asked: if indeed a nuclear bomb was exploded why is the evidence not more definitive? The reason may lay with the possibility that the detonation was designed to achieve ambiguity. There is good reason to suspect this:

* In 1958, South Africa had participated in monitoring a low-yield nuclear explosion by the United States in the Cape Town Anomaly, the same area as the 1979 blast. South Africa helped monitor fallout from that test. The Cape Town Anomaly had been purposely chosen because of its atmospheric quality (the area is high in natural radiation because it is the place where the ionized layer of the atmosphere comes closest to the earth) and the conditions enabled the testers to avoid detection (ships and planes avoid the area). 60

* The Senate Subcommittee on Nuclear Proliferation learned from the National Technical Information Service that the South African military/naval attache in Washington had requested a computer search of the literature on nuclear explosions and the seismic detection of nuclear explosions, including the flight plans, predicted orbit plots and operations of the Vela satellite—**the only request the NTIS had ever received for that information.** 61

Three other related developments also bear examination. South African Prime Minister P.W. Botha may have let something slip in a speech in Cape Town on September 25, 1979, just three days after the flash. South Africa, he said, might possess a secret weapon to counter "terrorism." "If there are people who are thinking of doing something else," he said, "I suggest they think twice about it. They might find out we have military weapons they do not know about." 62

Dr. Lukas D. Barnard ascended to the head of South Africa's intelligence and security bureau, the Department of National Security, not long before the
suspected detonation. Barnard, who had been trained in nuclear strategy in the United States, advocates a declared nuclear weapons policy as the best defense against South Africa's perceived enemies. Kenneth Adelman (now head of the U.S. Arms Control and Disarmament Agency) and Albion Knight pointed to Barnard's rise in power as a sign of South Africa's active nuclear weapons program in a 1981 study for the Stanford Research Institute. "Whether Dr. Barnard's proposal for clear notification of a nuclear weapons capability will become announced policy or not is impossible to tell," they wrote. "But it is safe to say that it is very close to official policy, if not identical with it."\(^63\)

An Oxford-trained South African scientist, Dr. Refrew Christie, was detained in South Africa in October 1979 under the Terrorism Act for giving foreigners classified data on sites which the South African Atomic Energy Board considered seismologically safe for detonating a nuclear device.\(^64\)

Needless to say, the South African government denied detonating the 1979 explosion.

**IMPLICATIONS FOR U.S. POLICY**

This entire episode presents serious concerns for U.S. policy. We know that South Africa has a nuclear weapons capability. That such a momentous event as a nuclear test may have been suppressed poses serious dangers for U.S. national security concerns, as well as for the maintenance of international peace. We cannot be satisfied with the pat dismissal from the executive branch that "the experts disagree"-- the issue is too important. Congress is also to blame: there has never been one Congressional hearing on the 1979 flash. Non-disclosure of the truth of this event may prove to be very costly. This is why we demand a comprehensive re-examination of this event and the release to the public of all pertinent information. We strongly urge that the National Academy of Sciences and the National Academy of Engineers be commissioned to undertake this study as well as an independent Congressional investigation.
As long as doubt remains, it should be this country's nuclear policy to err on the side of caution. The strong possibility that South Africa and Israel exploded a nuclear bomb should signal the immediate cessation of all nuclear assistance to these countries (although the U.S. has no nuclear cooperation with Israel at this time). Unfortunately, the Reagan Administration has allowed a significant increase in nuclear aid to South Africa over the past four years [see appendix A]. This assistance could be contributing directly to the growth of Pretoria's nuclear weapons program, and, therefore, must stop. The Reagan Administration's policy of "constructive engagement" has served to embolden the South African government in its aggressive apartheid policies and has provided to it needed hardware and technology. This underscores the need for Congress to re-exert its oversight function and to act immediately on pending legislation that would impose economic and political sanctions against South Africa, especially legislation that would prohibit any U.S. nuclear collaboration with South Africa. Nuclear weapons in the hands of the South African government are a threat to us all.

END
NOTES

4 David K. Willis, "How South Africa and Israel are Maneuvering for the Bomb," Christian Science Monitor, December 3, 1981.
7 Ibid.
10 Thomas O'Toole and Milton Benjamin, "Officials Hotly Debate Whether African Event was Atom Blast," Washington Post, January 17, 1980.
14 Freedom of Information Act Document released to the Washington Office on Africa by the U.S. Department of the Navy [hereafter, FOIA Document], Internal Naval Research Laboratory (NRL) Memorandum from Dr. Alan Berman for the file, August 7, 1980.


17 John Fialka, op. cit.


19 OSTP Panel Report, op. cit., p. 16.


21 OSTP Panel Report, op. cit., p. 16.


25 Ibid.

26 FOIA Document, Letter from Dr. L. Van Middlesworth to Dr. Alan Berman, NRL, September 25, 1980.

27 FOIA Document, Internal NRL Memorandum from Dr. K.W. Marlow, Branch Head, Condensed Matter and Radiation Sciences Division, NRL, October 27, 1980.

28 FOIA Document, Letter to Mr. John Marcum, Office of Science and Technology Policy, the White House, from Dr. Alan Berman, NRL, November 3, 1980.

29 Ibid.

30 Ibid.


32 FOIA Document, Internal NRL Memorandum from Dr. K.W. Marlow, February 26,

34 OSTP Panel Report, op. cit., p. 17.

35 See, for example, FOIA Document, Internal NRL Memorandum for file from Dr. John Goodman, March 5, 1980, and FOIA Document, Internal NRL Memorandum for file from Dr. Alan Berman, August 12, 1980.


37 Thomas O'Toole, op. cit.

38 FOIA Document, Internal NRL Memorandum from Dr. John Goodman to Dr. Alan Berman, July 23, 1980.

39 Ibid.


41 Thomas O'Toole and Milton Benjamin, op. cit.


43 Thomas O'Toole, "South Africa Ships 'in Zone of Suspected N-Blast'," Guardian, January 31, 1980.


45 O'Toole and Benjamin, op. cit.

46 Jack Anderson and Dale Van Atta, op. cit.

47 Ibid.


49 FOIA Document, Internal NRL Memorandum for file from Dr. Alan Berman, August 12, 1980.

50 FOIA Document, Internal NRL Memorandum for file from Dr. Alan Berman, August 7, 1980.

52 FOIA Document, Internal NRL Memorandum for file from Dr. Alan Berman, August 7, 1980.


54 Evans and Novak, op. cit.

55 O'Toole and Benjamin, op. cit.

56 FOIA Document, Internal NRL Memorandum for file from Dr. Alan Berman, August 7, 1980.

57 Eliot Marshall, op. cit.

58 Department of State Bulletin (v. 79, no. 2032), November 1979.


Appendix A

U.S. NUCLEAR ASSISTANCE TO SOUTH AFRICA UNDER REAGAN

The Reagan Administration's policy of "constructive engagement" has meant increased U.S. nuclear assistance to South Africa. The number of licenses from the Department of Commerce and the Department of Energy for private nuclear exports to South Africa has risen significantly. In March 1982, the administration allowed the export of a Control Data Cyber 170/750 computer to the state-controlled Council for Scientific and Industrial Research (CSIR) in South Africa. This computer had been held up in the inter-agency Subgroup on Nuclear Export Control (SNEC) for fourteen months previously because of its advanced capability to greatly boost Pretoria's nuclear weapons program. In August 1982, SNEC also approved an Amdahl 470/V7 computer for export to South Africa. Commerce Department Secretary Malcolm Baldridge admitted in a letter to former Senator Charles Percy (R-IL), then chairman of the Senate Foreign Relations Committee, that his agency had approved five export licenses from May 1980 to May 1982 for nuclear-related materials to South Africa, including vibration test equipment, which can be used to test the reliability of warheads and ballistic re-entry vehicles, and computers and multichannel analyzers, which can analyze data at a nuclear test site.

The Reagan Administration's willingness to provide nuclear assistance to South Africa was underscored by a U.S. General Accounting Office (GAO) report on U.S. nuclear exports released in September 1983. The study showed that South Africa was the third largest recipient of U.S. nuclear exports between July 1, 1981 and June 30, 1982. The administration approved seven nuclear-related exports to South Africa during that time period, including computers, ultrasonic tracking equipment, radio navigation equipment, and calibrating testing equipment, totalling more than $164.1 million. Totals for 1983 and 1984 were not made available.
Public pressure successfully stopped two other Commerce Department nuclear exports to South Africa during Reagan's first term. The Commerce Department proposed exporting 95 grams of helium-three, which when converted into tritium becomes an important component in thermonuclear weapons, and a hot isostatic press, a sophisticated piece of equipment used in making components for nuclear weapons. These two exports were stopped after considerable public and Congressional opposition.

In addition, the Department of Energy granted a license in October 1983 for U.S. companies to service the Koeberg nuclear power reactor, despite tremendous Congressional opposition. The Department of Energy granted a total of thirteen licenses for nuclear transfers to South Africa in 1983. Figures for 1981, 1982, and 1984 have not been made available.

The Reagan Administration also facilitated the shipment of enriched uranium from Europe to South Africa for use in Pretoria's Koeberg reactor in 1981 and 1982. Two U.S. companies, circumventing the U.S. Nuclear Nonproliferation Act, brokered and transported that enriched uranium to South Africa. The administration subsequently suspended a U.S.-South Africa uranium enrichment contract to South Africa's financial advantage.

Several U.S. nuclear technicians have been found working for the South African government in the Koeberg plant at very high salaries. Despite the fact that these technicians did not acquire the necessary license from the Department of Energy to do this work and thus violated the law, the DOE did not refer the case to the Justice Department for prosecution.

The administration voted against a resolution in the International Atomic Energy Agency (IAEA) 28th general conference in Vienna, Austria in September 1984 calling on all IAEA members to "end all nuclear cooperation with the South African regime, and, in particular, to terminate all transfers to South Africa of fissionable material and technology which could be used for developing the capability of producing nuclear arms and to reconsider their purchases of uranium from South Africa."
1945. Joint research program set up to recover SA uranium deposits to fuel US/UK nuclear weapons programs.

Nov. 23, 1950. SA Atomic Energy Board (AEB), US and Britain agree on joint large-scale uranium production.

July 8, 1957. SA and US sign 50-year Agreement on Nuclear Cooperation under “Atoms for Peace” program.


1961. AEB begins uranium enrichment research; SA purchases US Allis-Chalmers reactor (SAFARI I).


March 1965. SAFARI I becomes operative.

Aug. 1965. SA Prime Minister Verwoerd admits nuclear program has military uses.

1967. SA-built Pelindaba Zero (SAFARI II) starts up.

July 20, 1970. SA Prime Minister Vorster announces SA discovery of “unique” method of enriching uranium; Uranium Enrichment Corporation (UCOR) set up to build Valindaba pilot enrichment plant.

April 12, 1971. AEB President Roux says new enrichment process will enable SA to make its own nuclear weapons.


Dec. 13, 1974. UN Decree Number One demands end to exploitation of Namibian uranium and other resources.

1975. Ford Administration holds up shipment of highly enriched uranium for SAFARI I.


Oct. 1976. GE tender to build KOEBERG reactors supported by Ford Administration but dropped after Congressional opposition; SA signs with French consortium FRAMATOME.

Feb. 1977. Information Minister Mulder, asked if SA had the bomb, states: “If we are attacked, no rules apply at all if it comes to a question of our existence. We will use all means at our disposal whatever they may be.”

June 1977. OAU Council of Ministers calls on governments involved to terminate nuclear collaboration with SA; IAEA members expel SA from governing board.

June 1977. Carter Administration continues policy of no highly enriched uranium fuel for SAFARI I.

Aug. 6, 1977. USSR contacts US, Britain, France and West Germany with information on Kalahari nuclear test preparation, requests joint effort to stop test. Four powers concur that SA is preparing a nuclear blast (Carter later reports SA assurances not to use Kalahari site for tests).


April 1978. A 1974 CIA document reveals SA “could advance with a nuclear weapons program if seriously threatened.”

Sept. 1979. NNPA takes effect requiring full-scope safeguards as condition for enriched uranium exports.

Sept. 22, 1979. US Vela satellite records double flash of light (signature for nuclear explosion) in South Atlantic. Three days later, Prime Minister Botha says, “we have military weapons they do not know about.”


April 29, 1981. SA announces it can enrich uranium to fuel SAFARI I.

May 1981. Foreign Minister Pik Botha visits Washington to discuss nuclear relations with Reagan Administration, presses for resumption of enriched uranium supplies.


March 26, 1982. Commerce Department approves export to SA of Control Data computer with nuclear weapons uses.

May 1982. Commerce Department proposes export of Helium-3 (when irradiated, can be used as component for atom bomb); announces export of 5 types of dual-use nuclear equipment to SA over past 2-year period.

Oct. 1982. Representative Charles Rangel (D-NY) introduces legislation (HR 1020, now HR 1133) to ban nuclear exports to South Africa.


Appendix C

SOUTH AFRICAN GOVERNMENT OFFICIAL STATEMENTS ON NUCLEAR BOMB

"Let me just say that if we are attacked, no rules apply at all if it comes to a question of our existence. We will use all means at our disposal, whatever they may be. It is true that we have just completed our own pilot plant that uses very advanced technology, and that we have major uranium resources."


"[While] we are only interested in the peaceful applications of nuclear power, [South Africa] can enrich uranium and we have the capability [of mounting a nuclear defense.] And we did not sign the Nuclear Non-Proliferation Treaty."

-- John Vorster, South African Prime Minister, 1976 (Source: Ibid.)

[South Africa will develop a bomb, if necessary.] "If we wish to do things with our nuclear potential, we will jolly well do so according to our decisions and our own judgement. America cannot pressure us. We will not allow it."

-- Owen Horwood, South African Minister of Finance, August 30, 1977 (Source: Guardian (London), October 27, 1979)

"We should have such a [nuclear] bomb to prevent aggression from loud-mouthed Afro-Asiatic states...."

-- Dr. A. Visser, Member of South African Atomic Energy Board, early 1970s (Source: J.E. Spence, "The Republic of South Africa: Proliferation and the Politics of an "Outward Movement," in Robert M. Lawrence and Joel Larus, eds., Nuclear Proliferation Phase II [Lawrence, 1974])

"It is the duty of South Africa to consider not only military uses of the material but also to do all in its power to direct its uses for peaceful purposes."

-- Hendrick Vorwoerd, South African Prime Minister 1965. (Source: Ibid.)
Figure 1A

500mb TRAJECTORY
(NRL + NOAA)