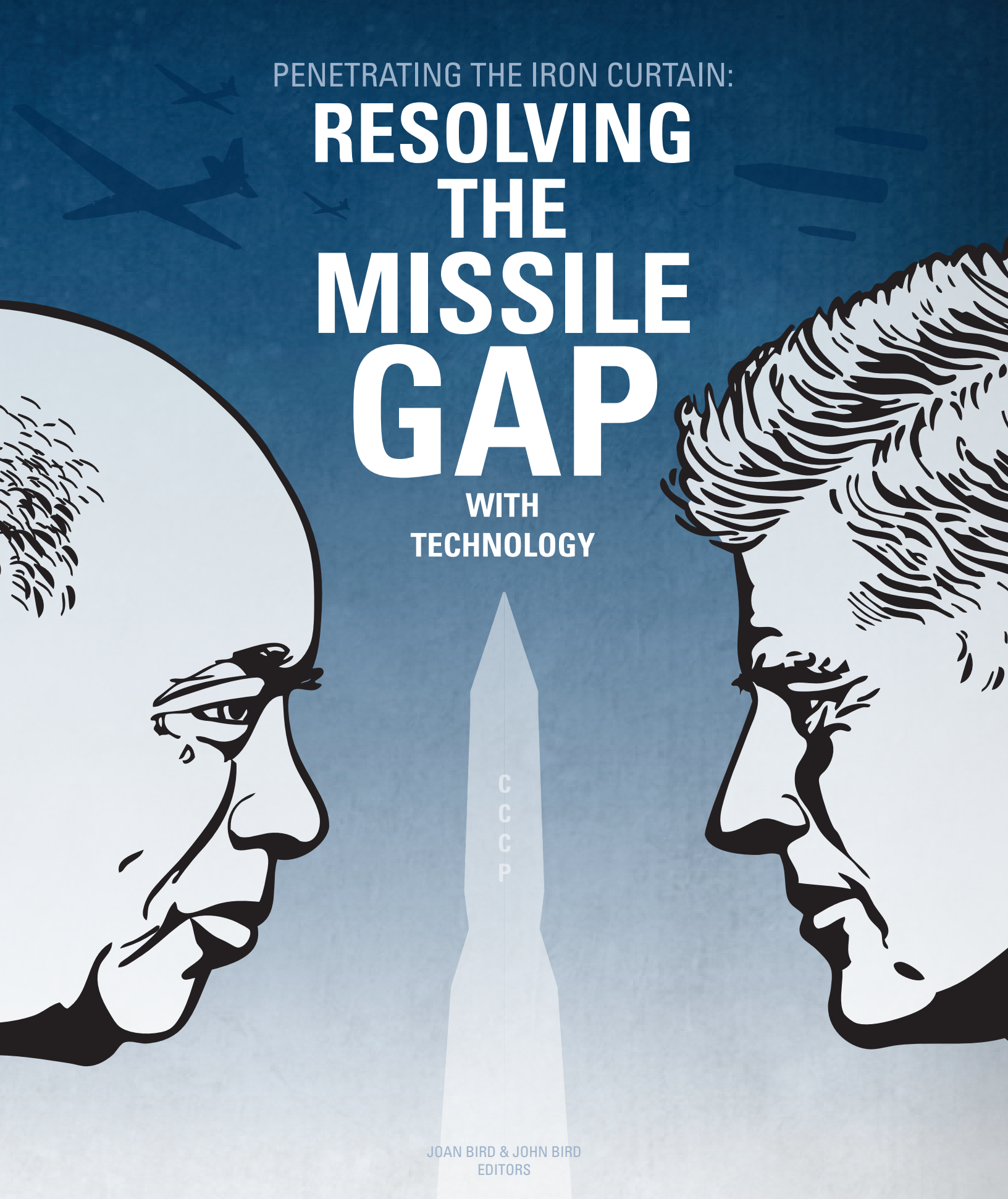
PENETRATING THE IRON CURTAIN:

RESOLVING THE MISSILE GAP WITH TECHNOLOGY



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EDITORS

HISTORICAL COLLECTIONS
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PARTNERS

HISTORICAL COLLECTIONS

The Historical Collections Division (HCD) of CIA's Information Management Services is responsible for executing the Agency's Historical Review Program. This program seeks to identify and declassify collections of documents that detail the Agency's analysis and activities relating to historically significant topics and events. HCD's goals include increasing the usability and accessibility of historical collections. HCD also develops release events and partnerships to highlight each collection and make it available to the broadest audience possible.

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- Improve current decision-making and analysis by facilitating reflection on the impacts and effects arising from past foreign policy decisions.
- Showcase CIA's contributions to national security and provide the American public with valuable insight into the workings of its government.
- Demonstrate the CIA's commitment to the Open Government Initiative and its three core values: Transparency, Participation, and Collaboration.

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PRESIDENTIAL LIBRARY AND MUSEUM

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- promoting open discourse on critical issues of our own time; and
- educating and encouraging citizens to contribute, through public and community service, to shaping our nation's future.

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As a relatively small institution with a wide-ranging agenda, the Library's success flows directly from the quality of each staff member's contribution, and from a genuine spirit of cooperation and teamwork based on courtesy and mutual respect.

AGENDA

1:00pm – 1:10pm	**WELCOME AND OPENING REMARKS** Mr. Tom Putnam Director, John F. Kennedy Presidential Library
1:10pm – 1:15pm	**THE CIA'S HISTORICAL REVIEW PROGRAM** Mr. Joe Lambert Director, Information Management Services, CIA
1:15pm – 2:45pm	**INTELLIGENCE PANELS** OVERVIEW OF THE MISSILE GAP John Bird, Co-author with Joan Bird of this study FACING THE MISSILE GAP Edward Proctor Drafter of the National Intelligence Estimate, and Chief of CIA's Guided Missile Task Force during the Missile Gap crisis THE PROBLEMS OF INTELLIGENCE ANALYSIS Robert Jervis Author of *Why Intelligence Fails: Lessons from the Iranian Revolution and the Iraq War*
3:15pm – 4:45pm	**US POLICY IMPLICATIONS** THE US CONTEXT OF THE MISSILE GAP CONTROVERSY Fred Kaplan Author of *Wizards of Armageddon* THE MISSILE GAP FROM A HISTORIAN'S VANTAGE Tim Naftali Author with Aleksandr Fursenko of *"One Hell of a Gamble": Khrushchev, Castro and Kennedy 1958-1964* INTELLIGENCE UNCERTAINTIES FROM THE POLICYMAKERS VANTAGE Ted Warner Secretary of Defense Representative to New START
4:45pm	**CLOSING REMARKS AND INTRODUCTION TO THE FORUM** Tom Putnam
4:50pm – 5:30pm	**Reception and Individual Discussions with Panel Members**
5:30pm – 7:00pm	**50th Anniversary: The Missile Gap Controversy** 50 years ago this month, President Kennedy received national security estimates that the gap between the USSR and the USA was a myth. Join historians Timothy Naftali , Fred Kaplan and John Prados for a discussion of this pivotal moment in history.
7:30pm – 9:00pm	**Reception for Invited Guests**

SYMPOSIUM SPEAKERS AND EDITORS

John Bird
John Bird, one of the authors of this study, had a 32 year career as an analyst of Soviet military issues at CIA. He has a Master of Arts in economics from the University of Washington and is a graduate of the National War College. In addition to his many assignments within the CIA, he served as Deputy National Intelligence Officer for General Purpose forces, as Director of the Strategic Warning Staff and as National Intelligence Officer for Warning. He was chief of the Intelligence Community's monitoring authority for all US arms control treaties and agreements. He also served as the Intelligence Community's Senior Intelligence Representative to the Conference on Disarmament during the negotiations that resulted in the Chemical Weapons Treaty. Since his retirement from CIA in 1994 he has worked with the Naval War College designing and assessing war games, and for the Army Training and Doctrine Command designing and assessing their Army After Next series of war games. In addition he has undertaken projects for the Intelligence Community during the last several years.

Robert Jervis
Robert Jervis (Ph.D., University of California at Berkeley, 1968) is the Adlai E. Stevenson Professor of International Politics and Deputy Chair of the Political Science Department at Columbia University, and has been a member of the faculty since 1980. He has also held professorial appointments at the University of California at Los Angeles and Harvard University. In 2000-2001, he served as the President of the American Political Science Association. Dr. Jervis is the co-editor of the Cornell Studies in Security Affairs, a series published by Cornell University Press, and the member of numerous editorial review boards for scholarly journals. His publications include *Perception and Misperception in International Politics* (Princeton University Press, 1976), *The Meaning of the Nuclear Revolution* (Cornell University Press, 1989), *Systems Effects: Complexity in Political and Social Life* (Princeton University Press, 1997), *American Foreign Policy in a New Era* (Routledge, 2005), and *Why Intelligence Fails: Lessons from the Fall of the Shah and Iraqi WMD*, Cornell University Press, April 2010 and several edited volumes and numerous articles in scholarly journals.

Fred Kaplan
Fred Kaplan is the national-security columnist for the online magazine Slate and a senior Schwartz fellow at the New American Foundation. For 20 years, he was a staff reporter for the *Boston Globe*, writing as the paper's military correspondent (1982-91), Moscow Bureau Chief (1992-95), and New York Bureau Chief (1995-2002). In 1983, he was a leading member of the team that wrote the *Globe's* Pulitzer Prize-winning Sunday magazine on the nuclear arms race.

Kaplan is the author of the prize-winning book about the history of nuclear strategy, *The Wizards of Armageddon* (Simon & Schuster, 1983; reprinted by Stanford University Press 1991). *Daydream Believers: How a Few Grand Ideas Wrecked American Power* (Wiley & Sons, 2008), and *1959: The Year Everything Changed* (Wiley & Sons, 2009).

He has written articles about politics, culture, and technology for the *New York Times, The Atlantic Monthly, The New Yorker, The Washington Post, Newsweek, The Washington Monthly, Nature, Scientific American, The Bulletin of the Atomic Scientists, The New York Magazine, Architectural Digest*, and other publications.

From 1978-80, Kaplan worked as the national-security adviser to Representative Les Aspin in the US House of Representatives. He graduated from Oberlin College, and has a Ph.D. in political science from the Massachusetts Institute of Technology.

Timothy Naftali
Timothy Naftali is the director of the Richard Nixon Presidential Library and Museum, a part of the National Archives and Records Administration. Before joining the National Archives, Naftali taught history at several universities, including the University of Virginia, where he also served as director of the Presidential Recording Program at the Miller Center of Public affairs.

Naftali is a prolific writer for both popular and scholarly audiences. His work has appeared on Slate.com, The New York Times, the Washington Post, Foreign Affairs, and other publications, and he has appeared on National Public Radio, the History Channel, and C-Span. He is the author of four books, including *Blind Sport: The Secret History of American Counterterrorism* and, with Aleksander Fursenko, *"One Hell of A Gamble": Khrushchev, Castro, and Kennedy, 1958-1964*. His second book with Fursenko, *Khrushchev's Cold War: The Inside Story of an American Adversary*, received the Duke of Westminster's Medal for Military Literature in June 2007. His most recent book, *George H.W. Bush*, appeared in December 2007 as part of The American Presidents Series, edited by the late Arthur M. Schlesinger, Jr., and Sean Wilentz.

Dr. Edward W. Proctor
Dr, Proctor had a 27 year career with the CIA, where he played a key role in foreign intelligence analysis. He has a Master of Arts in economics from Brown University and a PhD in economics from Harvard University. He began his career at CIA as an analyst of Soviet military-economic issues and was described as the US government's senior foreign intelligence analyst. He managed several components in the Directorate of Intelligence where he developed integrated analysis of the Soviet Union's strategic weapons program, led the CIA's Guided Missile Task Force and played the key role in the successful determination by the United States of the true state of Soviet strategic capabilities, thereby resolving the "missile gap" problem. He set the model for rigorous and relevant intelligence analysis. He served on the Board of National Estimates. As Director of the Directorate of Intelligence, he brought a new level of sophistication to intelligence analysis.

Edward (Ted) Warner III
Edward (Ted) Warner III is the Secretary of Defense Representative to New START and senior advisor to the Undersecretary (Policy) for Arms Control and Strategic Stability. He served as a deputy head of the US delegation that successfully concluded the New START Treaty with the Russian Federation in April 2010. The New START Treaty was ratified by the United States Senate on December 22, 2010.

Warner was Assistant Secretary of defense for Strategy and Requirements from May 1993 until November 1997, and Assistant Secretary of Defense for Strategy and Threat Reduction from November 1997 until October 2000. Warner was also responsible for Department of Defense policy for countering the proliferation of weapons of mass destruction; policy issues associated with US nuclear forces, ballistic missile defense, arms control, and cooperative threat reduction; as well as defense relations with Russia and the other newly independent states that emerged following the collapse of the Soviet Union.

Warner served in the Air Force for 20 years. His assignments included head of the Staff Group, Office of the Air Force Chief of Staff; assistant air attaché at the US Embassy, Moscow; analyst of Soviet military affairs with the Central Intelligence Agency; and an assistant professor of political science at the US Air Force Academy.

He graduated from the United States Naval Academy in 1962 with a degree in marine engineering. He completed a masters and a doctoral degree in politics at Princeton University.

Joan Bird

Joan Bird, one of the co-editors of this study, had a 29 year career at CIA as a senior analyst of Soviet issues, including Soviet space activities, Soviet policies on potential space weapons, and arms control of space and defense issues. She is a graduate of West Virginia University and spent three years at the Center for Naval War Studies of Naval War College developing ways to incorporate intelligence, space, communications and information operations in their studies and wargames. In addition to 25 years as an analyst, she spent 3 years as a member of the Defense and Space negotiating team and a year supporting the US delegation to the UN Conference on Disarmament on arms control for space. Since retirement in 1997 she has worked for the Naval War College working with the players and assessors of Information Operations in the Naval War College War Games, and for the Army Training and Doctrine Command assessing the information operations play of their Army after Next Series of war games. She is a co-author of several historical studies for the Historical Collections Division of CIA.

PENETRATING THE IRON CURTAIN: RESOLVING THE MISSILE GAP WITH TECHNOLOGY[1]

In the mid-1950s the US faced the first real challenge since World War II to its strategic superiority over any nation on earth. First it seemed that the Soviet Union was challenging us by producing and deploying a large strategic bomber force. Then, even as that perception was disproved, it became evident that the Soviets were placing their major effort toward developing strategic missiles against which, once launched, there was no defense. As the Eisenhower Administration strove to formulate policy to address the new circumstances, the Intelligence Community provided no clear picture of the scale, rate of production or breadth of deployment of Soviet missiles. The perceived missile gap that ensued was based on a comparison between US ICBM strength as then programmed, and reasonable, although erroneous estimates of prospective Soviet ICBM strength that were generally accepted by responsible officials.

The administration increasingly turned to the CIA with assignments to collect, produce, and disseminate missile intelligence to policymakers. It was a challenging mission that put CIA up against a Soviet Union, a country from which little information, clues, secrets, or whispers emanated, and any that did might only be intended to deceive. The goal was not only to guess what was behind the curtain, but also to find all ways possible to approximate with ever greater certainty.

These papers provide an enhanced analysis by and for scholars interested in that important, historic controversy. On the way to the solution, the process became overshadowed and sidelined by competing political, corporate, diplomatic, technological, and intelligence goals, providing us today with a fascinating template that is not far afield of the complexities facing modem intelligence missions and acts.

To convey the intelligence controversy, CIA has released a large selection of intelligence documents, declassified for the first time, coupled with others which were formerly declassified, but are released here again with significant withheld text now restored based on new, broader declassification guidelines. Together, these documents provide new insight into the reasoning, steps, and sidesteps used to determine Soviet missile strength in an atmosphere of growing national alarm and pressure. And it happened by CIA's eventual ability to crack the total Iron Curtain darkness and turn it into a thin, transparent veil, converting those early 'best guesses' into reliable, solid "I can easily show you" numbers and photos. But, for the moment, let's start at the beginning.

The attempt to collect intelligence on the Soviets began with an initial period of poor collection capabilities and consequent limited analysis. With few well-placed human sources inside the Soviet Union, it was only with the CIA's development of, what can only be called, timely technological wizardry—the U-2 aircraft and Corona Satellite reconnaissance program—that breakthroughs occurred in gaining valuable, game-changing intelligence. Coupled with the innovative use of aerial and satellite photography and other technical collection programs, the efforts began to produce solid, national intelligence.

[1] This essay was produced by Joan and John Bird.

At the outset of this period, the National Intelligence Estimates (NIEs) could best be characterized as a collection of possibilities about the Soviet ICBM program lacking a firm basis for national security policy-making. By the time the Soviets launched the first successful ICBM in August 1957, the urgency triggered an outsized national concern over what many saw as an alarming "missile gap." Better intelligence was demanded. The imprecision of the earlier NIEs, and the widely differing views of their contributors[2] added to the quandary of policymakers. Nonetheless, national intelligence products provided extensive alternative hypotheses—based on differing interpretations of the limited information collected—for different rates of development and production of Soviet ICBMs. Fortunately, as collection improved, the range of estimates narrowed until all but one member organization of the Intelligence Community joined in the consensus.

The apparent success of the Soviet ICBM and satellite (Sputnik) programs in 1957 spawned major reactions in the United States including the stimulation of new science and engineering studies; new college student financial assistance programs; and the initial or accelerated funding of about a dozen strategic attack programs simultaneously. The Intelligence Community determined that the "missile gap" was merely a product of ignorance and that the gap in missile programs actually favored the United States, not the USSR. That estimate provided, for the first time in over seven years, a basis for a new rationalization of defense procurement programs during the period 1962-1963. More importantly, it punctured Khrushchev's carefully nurtured deception of Soviet superiority just as the Berlin Crisis was coming to a head.

This study and supporting documents include this essay about the intelligence problems associated with the missile gap; an historical and originally classified essay written by two senior CIA intelligence analysts in the early 1970s; and Chapter 10 from *Wizards of Armageddon* by Fred Kaplan, critiquing the whole Missile Gap controversy. Most important for historians, this study contains a DVD attached to the back cover containing the declassified copies of some 200 intelligence and other documents pertaining to the missile gap controversy. There is also a linked "Catalogue of Documents" that provides information about who, what, where the documents were produced and, in some cases, to whom they were disseminated along with a brief description of the contents of each document.

What was the "Missile Gap"?

The "missile gap" was in essence a growing perception in the West, especially in the USA, that the Soviet Union was quickly developing an intercontinental range ballistic missile (ICBM) capability earlier, in greater numbers, and with far more capability than that of the United States. Although there were several ingredients in the US perception (actually a misperception), the principal ones were: effective Soviet secrecy; limited intelligence collection; biased analysis; Soviet deceptive announcements, and the actual Soviet success in testing intercontinental-range ballistic missiles. All of them were justified concerns.

[2] CIA participation in the collection and production of intelligence in the 1950s was constrained by National Security Council Intelligence Directives (NSCID). In particular see NSCID Number 1 (Revised), Duties and Responsibilities, 28 March 1952; NSCID Number 2, Coordination of Collection Activities Abroad, 13 January 1948; and NSCID Number 3, Coordination of Intelligence Production, 21 April for details about the responsibilities of the CIA and other Intelligence Community entities. These NSCIDs limited the role of CIA to economic and scientific collection and analysis, and directed the military services to provide military intelligence. The revised version of the NSCID broadened the areas for which the CIA could produce intelligence

Effective Soviet Secrecy

After World War II, Stalin reinstated in the Soviet Union draconian peacetime security measures. Travel in the USSR by foreigners was severely constrained; even visiting communists were closely monitored. Westerners faced far greater travel restrictions including wholesale proscription against travel in most of the USSR. Interaction with Soviet citizens inside the USSR exposed those citizens to harsh counterintelligence responses by Soviet secret police organizations, variously named the MGB, MVD, and finally the KGB. Despite liberalizing reforms by Khrushchev, opportunities for travel in the USSR and interaction with its citizens continued to be severely hindered. Under these circumstances, Western intelligence organizations were unable to establish and maintain clandestine USSR military sources with access to the Soviet missile programs during most of the 1950s.

Limited Intelligence Collection

Despite the tight security imposed by Stalin and his successors, CIA, with the participation of the US military, did develop some information about the Soviet programs from a number of sources—in the beginning, mainly émigrés—who could provide insight into the Soviet development efforts, but those sources provided little information about current activity. Analysis of all the bits of information from the various human sources eventually succeeded in providing the basis for major technical collection efforts against the Soviet missile test center at Kapustin Yar, a location north of the Caspian Sea area. For example, the British attempted to photograph the Kapustin Yar test center in 1953 but their special Canberra reconnaissance aircraft was damaged and almost shot down by Soviet fighters. Other technical collection efforts included radar, intercepted telemetry, and finally, the U-2 photography. Through these efforts, the US intelligence organizations were able to monitor the Soviet medium- and intermediate-range missile (MRBM and IRBM) development process centered in Kapustin Yar.

The Soviet ICBM test site, however, was in a more remote part of Central Asia. Human sources had scant information, but some of the technical collection systems in place for the Kapustin Yar effort yielded important evidence at the beginning of ICBM testing. Other evidence, which became available, provided the basis for searching for a new ICBM launch complex in Kazakhstan and an associated instrumented impact area on the Kamchatka Peninsula. New collection efforts against activity at this site substantially revealed the characteristics of the first Soviet ICBM. A U-2 mission penetrated the Soviet air defenses and successfully photographed the Tyura Tarn ICBM test launch area in Kazakhstan in August 1957. In 1960, the CORONA satellites[3] began providing low resolution, broad area coverage of the USSR. By the summer of 1961, new intelligence estimates dramatically reduced the projections of Soviet ICBM deployment. Not only was the technical penetration of the Soviet missile program successful, but the clandestine service had developed an inside source. Colonel Oleg Penkovskiy, with access at the upper levels of the Ministry of Defense. In 1961, Penkovskiy reported senior Soviet generals believed that the initial Soviet version of an intercontinental range missile was unsuccessful and Khrushchev's boastings about it were mere chest-thumping bluffs. By the end of 1962 the veil of total secrecy maintained by the Soviet Union had begun to wear.

[3] CORONA is the code name for the first covert satellite reconnaissance program. The CORONA satellites were first successful on a small scale on the fourteenth attempt in August 1960. Problems with the satellites did not end then but gradually usable, albeit very low resolution coverage of the territory of USSR was obtained.

Soviet Deception

Starting in January 1957[4], Soviet statements in general—and First Secretary of the Communist Party of the USSR Khrushchev in particular—clearly distorted the facts of Soviet development, creating the false impression that Soviet ICBM development, production, and deployment were far more advanced than was true. Yet, the Soviet propaganda found a receptive US audience. The chapter from the Wizards of Armageddon by Fred Kaplan (reproduced in this study) relates that the US response was driven by self-interests that ranged from encouraging support for a greater military budget or share thereof, to urging support for a more aggressive foreign policy within the Eisenhower administration, to political support for opponents of the administration.

Political Pressures Grow In Information Vacuum

The political pressures, which fed upon the facts and the misperceptions of the Soviet ICBM program, included the selective leakage of intelligence judgments, and the exaggeration and distortion of the Soviet statements by the press and politicians. Before satellite photography and the new clandestine information were available, the military services clearly [and understandably] took positions in the National Estimates reflecting their convictions—public and private—that the projections of various Soviet weapons procurement and deployment programs would unquestionably impact their share of US defense appropriations. In contrast, leaked information to opposition politicians seeking to discredit the Eisenhower administration put pressure on the administration to seek every means to discover the reality of the situation, resulting in the development of the U-2 for overflights of the USSR and finally, the successful satellite reconnaissance program.

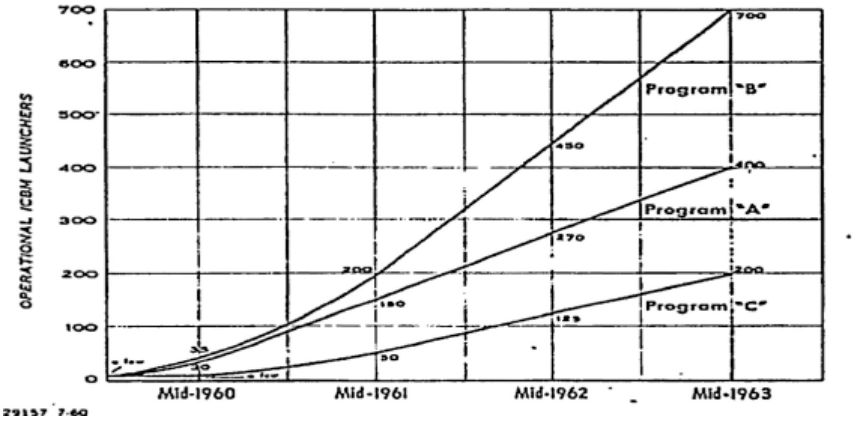
US and Soviet foreign policy initiatives added to the problem, with disincentives to undertake risky intelligence collection efforts. Opposing the pressure to succeed with more and bolder intelligence collection were other administration pleas to use the opportunity to achieve some kind of negotiated arms control, and the not unrelated vigorous complaints by the Soviets over violations of their territory. These external political pressures so influenced President Eisenhower that he actually stopped the U-2 overflights for sixteen months at the height of the missile gap controversy. However, as internal political pressures grew to unmask the true state of the Soviet ICBM program, the President relented and reauthorized overflights. Although successful right up to the Soviet downing of Gary Power's U-2 over Sverdlovsk, U-2-collected photography did not answer the crucial question about the extent of Soviet ICBM deployment. The political controversies and pressures persisted into mid-to-late 1961 when enough successful flights of the new US CORONA photographic satellites provided coverage of the USSR sufficient to indicate the Soviets did not have many deployed ICBMs—in fact, far fewer than the United States.

Biased Analysis

Analysis can be biased for a number of reasons: bad data; implicit assumptions, and self-interest rank highest. Before the arrival of the comprehensive photographic coverage of the USSR by the CORONA satellites, the limited information available about production and deployment of Soviet ICBMs was an inadequate basis for statistical analysis and, as events proved, even for judgments based on intuition.

[4] See Document 58, FBIS Radio Propaganda Report, *Soviet Propaganda Treatment of the USSR's Strategic Rocket Capability*, page 6.

With the military branches and other military entities providing, exclusively, intelligence analysis on all aspects of the Soviet forces, including size, operations, and capabilities, it does not seem surprising the most egregious exaggerations of Soviet military strength emanated from the branch of service likely to benefit by an overblown enemy threat. The US Army and US Navy intelligence estimates of Soviet ICBM production were very conservative. In the National Intelligence Estimate NIE 11-8-60, *Soviet Capabilities for Long-Range Attack*[5], they estimated the Soviets would have only a few ICBMS by mid-1960 and about 50 by mid-1961. In the same estimate, the USAF confidently estimated the Soviets would have 35 by mid-1960 and about 200 by mid-1961. The CIA estimate fell between the two. However, as that NIE and the few following prior to September 1961 indicated, there clearly was little evidence to support any of those estimates other than a few flight tests of the first Soviet ICBM and some gross estimates of potential ICBM production capacity. All the estimates were of a larger force than existed. In the graph below taken from NIE I1-8-1960 the USAF estimate is "Program B"; the Army and Navy estimate is "Program C"; and the CIA estimate is "Program A."



During the period up to 1964, the bureaucratic undertone of resistance to allowing the CIA to engage in any sort of intelligence on military issues continued. The CIA's rectifying analysis of the bomber and missile gaps, and later of the Soviet ground forces, ultimately resulted in modifications of the national intelligence regulations—the NSCIDs and DCIDs[6]—authorizing or requiring various IC actions that broadened CIA's role.

Real World Facts Emerge

The Gap...

On 26 August 1957, the Soviets announced they successfully tested an ICBM[7]. The IC intelligence analysts believed it was a launch from the new ICBM and space launch center near Tyura Tam in Kazakhstan and that the missile traveled across the USSR to an intended impact on the Kamchatka Peninsula near the Pacific coast of the USSR. Within two days of the announcement, a U-2 was launched to photograph the site. On 4 October 1957, the Soviets successfully launched the first space

[5] See Document 84 for NIE 11-8-1960, Soviet Capabilities for Long-Range Attack.

[6] DCIDs are Director Central Intelligence Directives.

[7] See 26 August 1957 FBIS Soviet and Eastern Europe Dally Report for the TASS report. The "ICBM" was known later as the SS-6 or Type A surface-to-surface missile.

satellite: Sputnik. In the eyes of the world, both feats established a prominent place for Soviet space science. In reality, the Soviet ICBM was unwieldy as a weapon for it required a massive infrastructure and was deployed only to one operational location. Most US intelligence organizations greatly overestimated the extent of production and deployment of this missile, and it was these estimates that became the Soviet side of the "missile gap" equation.

At the time, the Soviets also were developing two new models of an ICBM, the SS-7 and the SS-8[8], that would be tested beginning in the early 1960s and deployed in some number by 1963. The early evidence of preparations for their deployment tended to blend with the testing of the SS-6, creating, in the eyes of many, the basis for estimating an early and widespread deployment of the SS-6 system, a deployment that never occurred. During the same period, the United States was frantically working on several versions of an ICBM capable of carrying a nuclear warhead to targets in the USSR or China. While publicized launch failures and pessimism about the future of US efforts became the basis for the US side of the "missile gap," it hid the reality that several missiles then under development were successful and deployed. Indeed their deployment outstripped the Soviet's efforts so much that by 1961, and probably as early as 1959, the "gap" was actually in favor of the US though not widely recognized as such.

Development of ICBMs and Reconnaissance Programs...
Many wondered how the Soviets had gained such a head start, but the Soviet ICBM program was the culmination of a long, deliberate research and development program started soon after World War II. It was significantly aided in the early years by German rocket scientists and equipment captured at the end of the war. The West learned of the program through interviews with returnees and an occasional defector. Western intelligence organizations soon set up technical collection systems to monitor missile development at the Soviet's Kapustin Yar test range. The big radar set-up by the USAF at Diyarbakir, Turkey was one example. The Soviet program evolved through the German V-2 and the Soviet equivalents to longer-range missiles capable of traveling 700-1000 nautical miles or more. As these latter missiles were being tested, evidence began to suggest a new test range was being developed near Novokazalinsk and Dzhusaly in the Kazakh SSR, with an impact area at Klyuchi on the Kamchatka Peninsula. On 5 August 1957, a CIA U-2 reconnaissance aircraft searching along the Chkalov-Tashkent rail line in the Kzyl-Orda Oblast' in Kazakhstan photographed—in the distance—what was identified as the Tyura Tam missile test range head. It was 21 days later when the Soviets announced they had successfully launched an ICBM, and two days after that announcement when another U-2 flew directly over the site providing definitive photography of all its features[9].

The Dawn of Satellite Reconnaissance
The U-2 program successfully provided important photography of the two main Soviet missile test centers at Tyura Tam and Kapustin Yar but it did not provide photography of most of the potential USSR deployment areas. In recognition of the limitations of aerial reconnaissance, both the CIA and the USAF proposed to develop reconnaissance satellites to cover the wide expanse of the USSR. The President approved the CIA program in February 1958 and, in August 1960, the first fully successful satellite in that program yielded more usable photography of the USSR than all 24 U-2 flights together. A new era in intelligence collection and analysis was dawning.

[8] These ICBMs were also known in the Intelligence Community as type B and type C respectively.
[9] For an exhaustive description of the U-2 program, see Document 164, Central Intelligence Agency and Overhead Reconnaissance: the U-2 and OXCART Programs, 1954-1974 by Gregory W. Pedlow and Donald E. Welzenbach, History Staff, Central Intelligence Agency, Washington, D.C., 1992.

Proving a Negative...

Not recognized at the time, the real problem to be solved for US intelligence was not to prove a positive, i.e., where were the Soviet ICBMs, but to try to prove a negative—that there was no widespread Soviet ICBM deployment. Only full coverage of all potential launch sites would suffice as proof. Those intelligence organizations postulating a large, widely-dispersed force continued to press their views in the December NIE 11-4-60[10] even as the increasingly successful satellite reconnaissance program was covering large sections of the USSR but finding little cause to support a Soviet force in being. This situation changed rapidly as the increasingly comprehensive satellite coverage and photo interpretation[11] indicated the suspected sites were not ICBM sites at all, or were only in an early state of construction. Although a clandestine report from Soviet Colonel Oleg Penkovskiy indicated in the spring of 1961 that Khrushchev had been carrying out a massive deception and only a very small number of ICBMs were operational, it was not until later in the summer that the true reduced status of the Soviet ICBM program became clear. The change in the National Intelligence Estimates of Soviet ICBM operational force levels between the June 1961 estimate and the September edition[12] reflected the now clearer picture of actual ICBM deployment in the USSR.

As late as mid-1963, in the Kennedy Administration, the full picture of what happened about the missile gap was still being investigated. The documents attached to this study from the Kennedy Presidential Library clearly show the President wanted the whole episode sorted out in a study or history that he requested of National Security Advisor McGeorge "Mac" Bundy in the spring of 1963.

In sum, the efforts of the two nations to produce an ICBM force proceeded in parallel with the Soviets making the first, highly public, successful ICBM launch in August 1957, and the United States deploying the first unit of ICBMs in 1959 followed by a steady stream of new US deployments well before meaningful Soviet deployment began. Yet this clear outcome only became evident following years of thoughtful yet frustrating analysis-in-the-dark, and then was only partially helped by U-2 photographic coverage, and finally saw a full resolution to the missile gap question through HUMINT [Penkovskiy] and USSR-wide satellite reconnaissance.

The missile gap controversy enjoyed the fortunate good timing of a series of technological advancements and human sources that brought weak, successive approximations of the earlier NIEs into the realm of reliable, solid evidence suitable for sound policymaking. And it demonstrates that intelligence involves considerable effort, inventiveness, luck, diplomacy, and a sound leadership to keep the mission from becoming snared in all the side issues that often surround matters of alarming international competition and internal national anxieties. There are many 'take home lessons' in the attached documents that display America's quick and cautious response to the unknown and overstated Soviet ICBM threat of 1955-1964.

[10]See Document 92, NIE 11-4-60, *Main Trends in Soviet Capabilities and Policies, 1960-1965*, 1 December 1950.

[11]These reports produced by the National Photographic Interpretation Center are replicated on the attached DVD.

[12]See Documents 98,98a, 130,131 and 134 for the estimates of this period.